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DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS (DPWH)  
DEPARTMENT OF INTERIOR AND LOCAL GOVERNMENT (DILG)  
THE REPUBLIC OF THE PHILIPPINES

**THE URGENT DEVELOPMENT STUDY ON  
THE PROJECT ON  
REHABILITATION AND RECOVERY  
FROM TYPHOON YOLANDA  
IN  
THE PHILIPPINES**

**FINAL REPORT (I)**

**MAIN REPORT**

**VOLUME 2: GENERAL GRANT  
AID PROJECT**

**JUNE 2015**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

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Main Report	Volume 1	Recovery and Reconstruction Planning
	Volume 2	General Grant Aid Project
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US\$ 1.00 = Philippines Peso (PHP) 44.56 = Japanese Yen ¥ 123.96  
(June, 2015)

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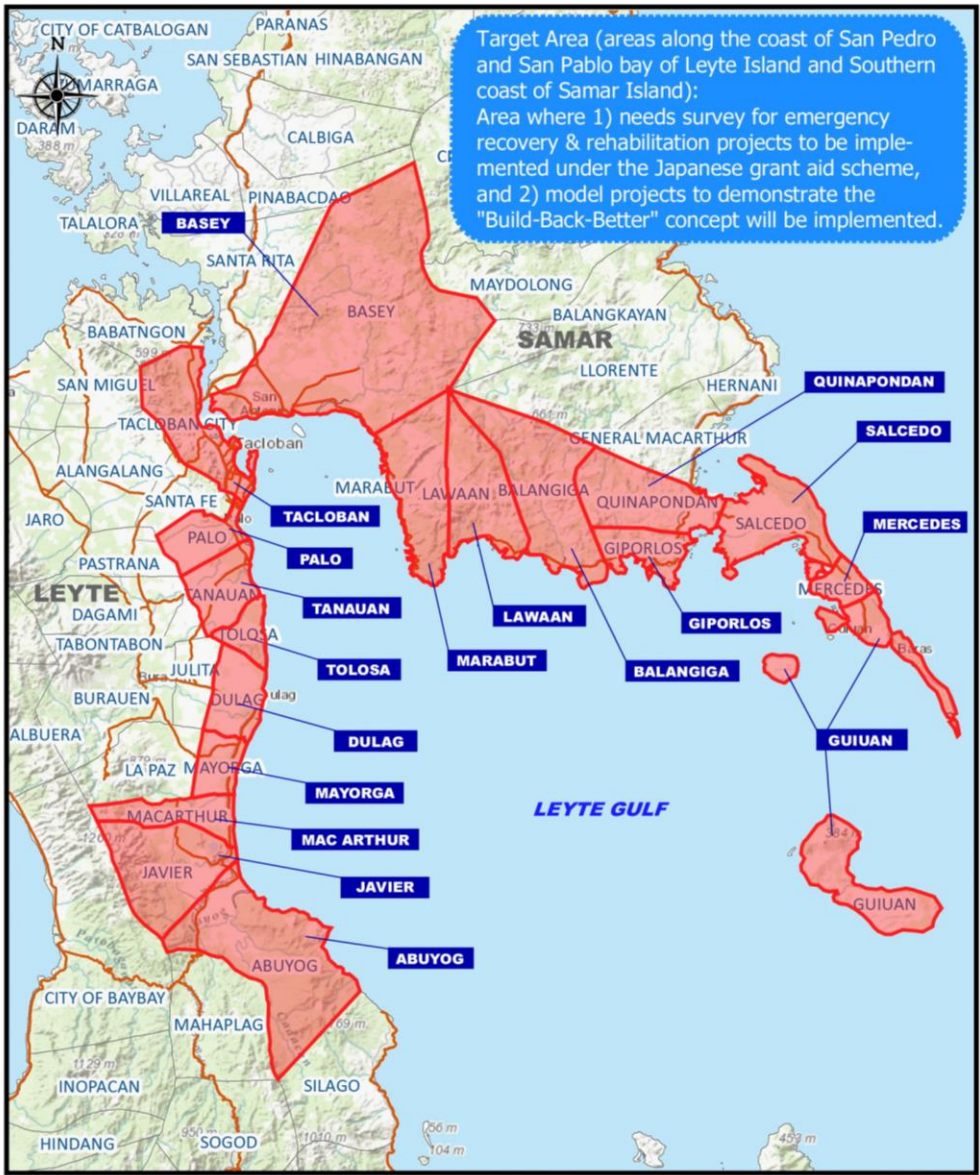
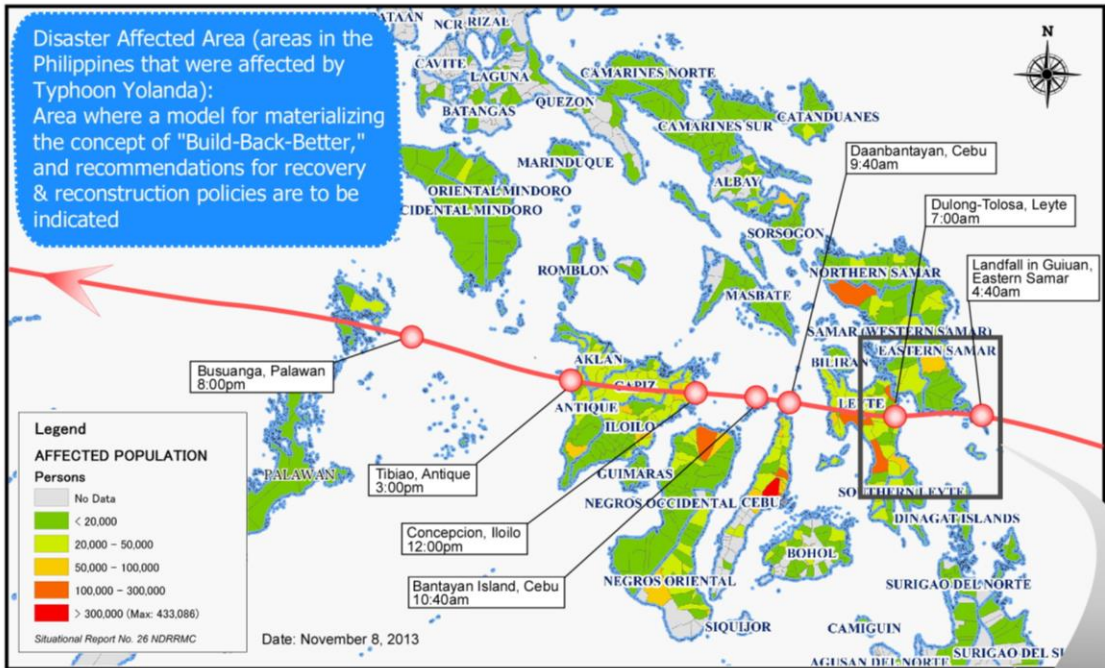
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**Project Location Map**

**Photos**



**Collapsed Elementary School**



**Collapsed School of Steel Construction**



**Heavily Damage of RHU**



**Damage by Storm Surge on 1<sup>st</sup> Floor of EVRMC**



**Repair of Electrical Distribution**



**Discarded Electrical Equipment by Inundation**



**Collapse and Derelict Building**



**Final Disposal Site of Wreckage**



Damaged Engine Room Simulator



Damaged GMDSS simulator



Damaged Cultivating Tank



Damaged Nursery Facilities



Destroyed X-ray Inspection System



Manual Check of Security Screening



Before Typhoon, this office has 2nd floor with Reinforced Concrete(Marabut)



Damaged office due to aging and by typhoon (Lawaan)



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## Abbreviations

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ABC	Association of Barangay Councils
ADB	Asian Development Bank
APTERR	ASEAN Plus Three Emergency Rice Reserve
ASEAN	Association of South - East Asian Nations
AVR	Automatic Voltage Regulator
BFAR	Bureau of Fisheries & Aquatic Resources
BHC	Barangay Health Centre
BHS	Barangay Health Station
BIR	Bureau of Internal Revenue
BM	Bench Mark
BPO	Business Process Outsourcing Association of the Philippines
CAAP	Civil Aviation Authority of the Philippines
CES	Central Elementary School
CHD	Center For Health Development
CHO	City Health Office
CNC	Certificate of Non-Coverage
CPU	Central Processing Unit
DA	Department of Agriculture
DAC	Development Assistance Committee
DAO	DENR Administrative Order
DBM	Department of Budget and Management
DCPT	Dynamic Cone Penetration Tests
DENR	Department of Environment and Natural Resources
DepEd	Department of Education
DILG	Department of the Interior and Local Government
DOE	Department of Energy
DOF	Department of Finance
DOH	Department of Health
DOLE	Department of Labor and Employment
DOTC	Department of Transportation and Communication
DPWH	Department of Public Works and Highways
DRRM	Disaster Risk Reduction and Management Act
DSC	Digital Selective Calling
DZRMES	Daniel Z. Romualdez Memorial Elementary School
EC	Electric Cooperative
ECC	Environmental Clearance Certificate
ECPs	Environmentally Critical Projects
EIA	Environmental Impact Assessment
EM-DAT	The International Emergency Events Database
EMB	Environmental Management Bureau
EPIRA	Electric Power Industry Restructuring Act:
EPS	Education Program Supervisor
ERM	Engine-room Resource Management
EU	European Union
EVRMC	Eastern Visaya Regional Medical Center
FAO	Food and Agriculture Organization
FCP	Fire Code of the Philippines
GCP	GCP : Geodetic Control Point
GDP	Gross Domestic Product
GMDSS	Global Maritime Distress and Safety System
GMFDC	Guiuan Marine Fisheries Development Center
GMRDC	Guiuan Mariculture Research and Development Center
GPS	Global Positioning System
GSI	Geographical Survey Institute
HMS	Hospital Maintenance Service
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IEC	International Electrotechnical Commission
IEEC	Environmental Management Bureau
IMF	International Monetary Fund

IMO	International Maritime Organization
IMR	Infant Mortality Rate
IOM	International Organization for Migration
IRR	Implementing Rules and Regulations
ISCGM	International Steering Committee for Global Mapping
JASS	Japanese Architectural Standard Specification
JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standards
LGU	Local Government Unit
MARINA	Maritime Industry Authority
MGB	Mines and Geosciences Bureau
MHO	Municipal Health Office
MMR	Maternal Mortality Rate
NAMRIA	National Mapping and Resource Information Authority
NBCP	National Building Code of the Philippines
NCR	National Capital Region
NDRRMC	National Disaster Risk Reduction and Management Council
NDRRMF	National Disaster Risk Reduction and Management Framework
NDRRMP	National Disaster Risk Reduction and Management Plan
NEA	National Electrification Administration
NECP	Non- Environmentally-Critical Project
NEDA	National Economic and Development Authority
NFRDI	National Fisheries Research and Development Institute
NGCP	National Grid Corporation of the Philippines
NGO	Non-Governmental Organizations
NHA	National Housing Authority
NMP	National Maritime Polytechnic
NPC	National Power Corporation
OECD	Organization for Economic Co-operation and Development
OTS	Office of Transportation Security
PD	Project Description
PEISS	Philippine Environmental Impact Statement System
PHO	Provincial Health Office
PHP	Philippine Peso
PSC	Port State Control
PTA	Parent Teacher Association
PTAFCO	Philippine Taiyo Aqua Farm Corporation
RAY	Reconstruction Assistance on Yolanda
RHU	Rural Health Unit
SAT	Site Acceptance Test
SEAFDEC	Southeast Asian Fisheries Development Center
SOLAS	The International Convention for the Safety of Life at Sea
STCW	The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
TRANSCO	National Transmission Corporation
TSA	Transportation Security Administration
TTS	Telegraphic Transfer Selling rate
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergency Fund
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UPS	Uninterruptible Power Supply System
VAT	Value-Added Tax
VHF	Very High Frequency Wave
WB	World Bank
WFP	United Nations World Food Programme
WHO	World Health Organization
WTMD	Walk-through Metal Detectors

# CHAPTER 1      **Background of the Project**

## **1-1 Background of the Grant Aid**

The Philippines is one of the most disaster-prone countries in Southeast Asia. Catastrophic disasters occur almost every year and cause enormous economic damage and human suffering. In addition, repeated damage to infrastructure has negatively affected economic activities in the long term.

Typhoon Yolanda (known as Haiyan internationally), described as an "Unprecedented typhoon in scale", made its first landfall over Eastern Samar at the early morning on 8th of November with the lowest central pressure ever recorded, 895 hPa. After the second landfall on Leyte Island, it crossed the Visayas region maintaining its strength with the maximum wind speed of 105 m/s. It brought a massive storm surge causing the maximum inundation depth of about 8 m. As the result, the typhoon caused massive destruction over nine regions out of the seventeen regions in the country. The number of casualties reached over 6,000, damaged houses reached over 1 million, and more than 4 million people were reported to be left homeless. Especially, Region VIII, where northeast coast of Leyte and south coast of Samar are included, was severely and extensively damaged by the huge storm surge with a great number of casualties. The region suffered catastrophic damage to houses, public facilities such as schools, government office buildings and medical institutions, transport infrastructures including bridges, roads, airports and harbors, and finally, public services such as drinking water, sewerage, and electricity. According to the Philippine government, the total cost of damage is estimated at PhP 571.1 billion (US\$ 12.9 billion), and the requirement for rehabilitation is at PhP 360.9 billion (US\$ 8.2 billion). Considering the revenue of the Philippine government was US\$ 4.61 billion in the 2013 fiscal year, the Philippine government will experience a heavy burden for some years ahead.

Considering the above mentioned circumstances, the goal of this project is to support the early recovery activities in devastated areas through the facility reconstruction and equipment procurement, especially targeting prioritized activities among the social infrastructures such as medical institutes, schools and government office buildings, economic infrastructures and disaster management infrastructures with the aim of contribution to a disaster resilient society. The facilities to be constructed with grant aid will be studied based on the following policies considering the result of a site survey and consultation with a counterpart agency.

- The study will be carried out with the principle of quick rehabilitation of infrastructures, facilities and equipment.
- In order to reduce the damage when another typhoon which has the same strength as Typhoon Yolanda comes, design criterion will be applied for designing successful examples for disaster resilient construction of infrastructures, facilities, and equipment.
- The project will be classified as a "General Grant Aid Project" to ensure transparency in procurement process for disaster recovery and reconstruction, which was mentioned by the Presidential Assistant for Rehabilitation and Recovery.



## 1-2 Natural Conditions

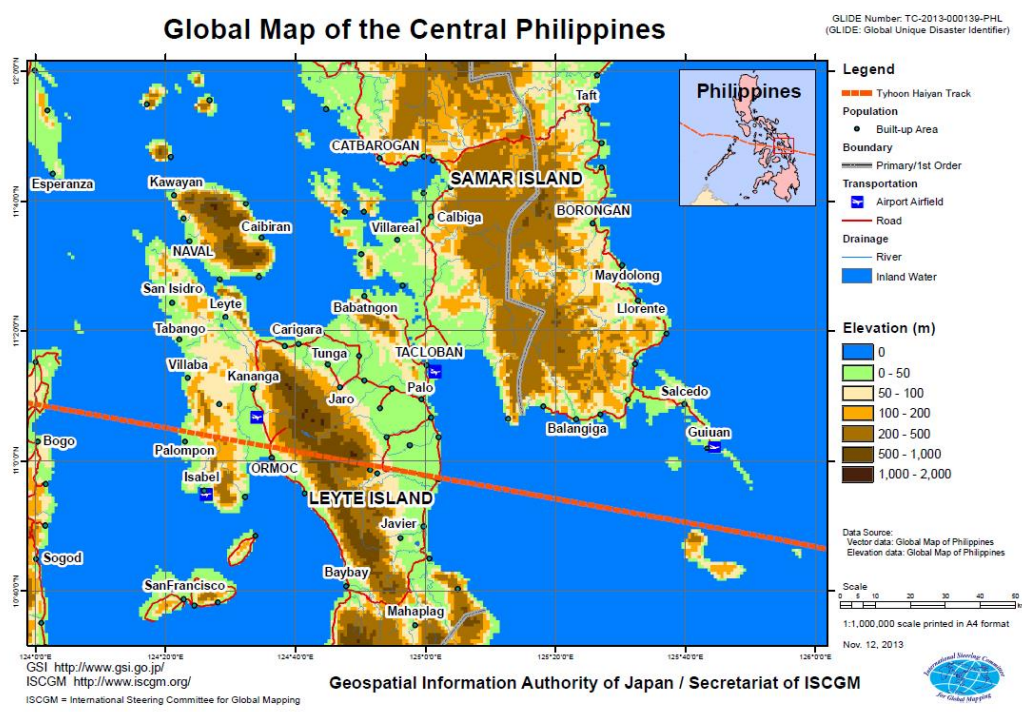
Target areas of the project are the northeast coast of Leyte Island and the southern coast of Samar Island, which face each other across San Juanico Strait running in the direction of north and south. Tacloban city which suffered the greatest disaster of high tide is located at the southern mouth of San Juanico strait on the northeast side of Leyte. San Pedro and San Pablo Bay forms the inner bay, and is wedged between Leyte and Samar. Leyte Gulf is located outside of it.

Leyte is a slender island with a range of 180km in the direction of north and south, and narrower at 65km in the direction of east and west.

Tacloban city basically forms the flat ground with an altitude of 5 m or less except for the peninsula part, and has a low mountain range in the west side.

A low plain zone is located from the southeast to northwest of Palo town where it extends to the south of the city and the mountain ends.

In the southern Samar, a little low mountain is near the strait, however near Basey Province is low swampy plain. The mountain range is near the coastline in the east side of Basey, and continues to Guiuan peninsula, and forms the complicated coastline.



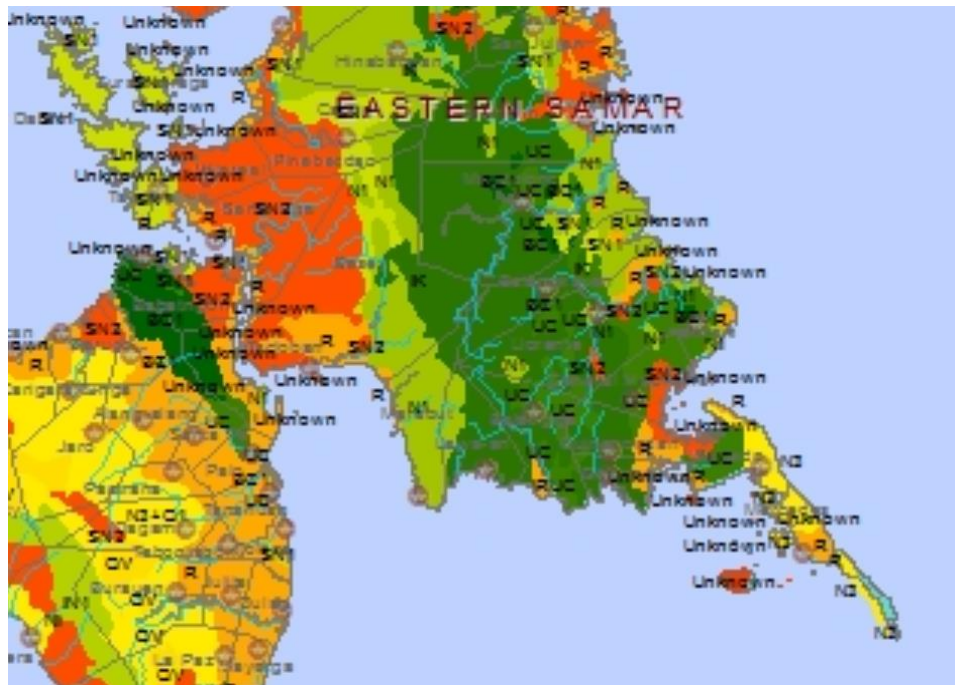
Source: Geospatial Information Authority of Japan (GSI), Global Map of International Steering Committee for Global Mapping (ISCGM)

**Figure 1-2-1 Topographic Map of Leyte and Samar**

In Tacloban city in Leyte, the part which represents the round peninsula is made of volcanic rock, and the west mountain range of the city is made of sedimentary rock and ophiolite suite metamorphosed from penetration of peridotite and gabbro which turned into seroentine in the Cretaceous - Palacene, and the whole flat plain wedged between them forms alluvial flat in Quaternary. In addition, the Philippines fault is running through Leyte to north and south.

The zone faced on San Juanico Strait, the west of Samar, consists of Upper Miocene - Pliocene sedimentary or volcanic rock, but Basey flat plain, west of Basey, forms an alluvial flat. The basement complex is mainly made of metamorphosed volcanic and sedimentary rocks in the Upper Cretaceous period, and accompanies the thrust mass chert and ultramafic rock. These rocks are penetrated by diorite in the Paleogene, and are covered with arenite, lime stone and volcanic rock etc.

The locations in which this boring survey was conducted are fundamentally a plain field of alluvium layer, and it can be subject to liquefaction from sandy layers being on foundations.



Source: WEB, “Geographic Information System, Geology Region 8”, Dovetail Ventures Asia Incorporated Provided by Mines and Geoscience Bureau (MGB)

**Figure 1-2-2 Geological Map in Leyte and Samar**

**Table 1-2-1 Symbol of Geochronologic Division**

Code	Color	Geochronologic Division
R	Khaki	Holecene
SN2	Orange	Upper Miocene-Pliocene
N1	Light green	Neogene
UC	Green	Cretaceous-Paleogene
QV	Yellow	Pliocene-Quarternary

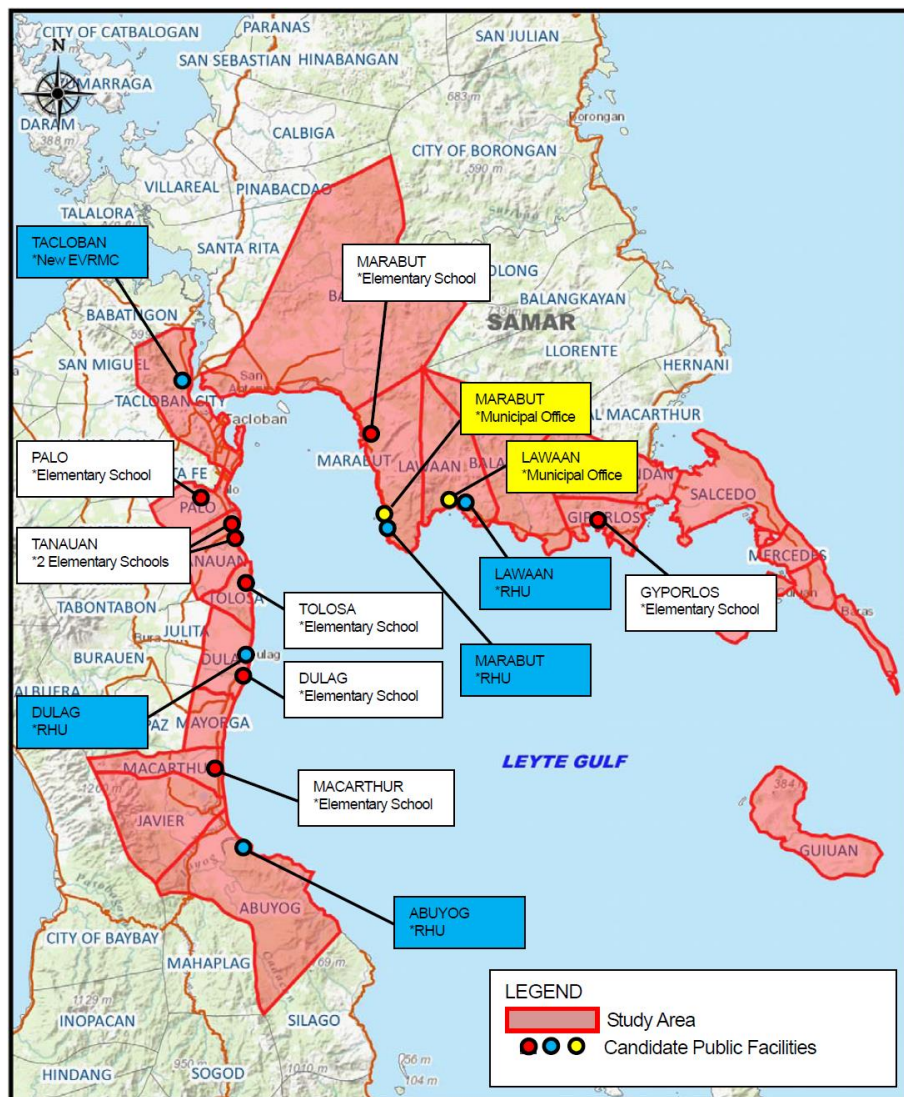
**(1) Results of Topographic Survey**

**1) Objects of Topographic Survey**

As to the buildings, the topographic surveys of elementary schools (8 places), RHU medical centers (2 places) and office complexes with RHU (2 places) are to be carried out, and the topographic maps and the cross sections are to be created.

**Table 1-2-2 Details of Major Survey Works of Buildings**

Description		Elementary School	Medical Facility	Office Complex +RHU	Remarks
Numbers of Facilities		8	2	2	
Topographic Survey	Area	as appropriate	as appropriate	as appropriate	
	Scale	1:500 or proper	1:500 or proper	1:500 or proper	
Cross-sectional Survey	Width	as appropriate	as appropriate		
	Interval	20m	20m	20m	
	Scale	1:500 or proper	1:500 or proper	1:500 or proper	



**Figure 1-2-3 Location Map of the Nominated Public Facilities for Grant Aid Project**

## 2) Location of NAMRIA BM

BM of NAMRIA which is the closest to the building and the river, and efficient in survey work is used for surveying.



Figure 1-2-4 BM of NAMRIA in Leyte

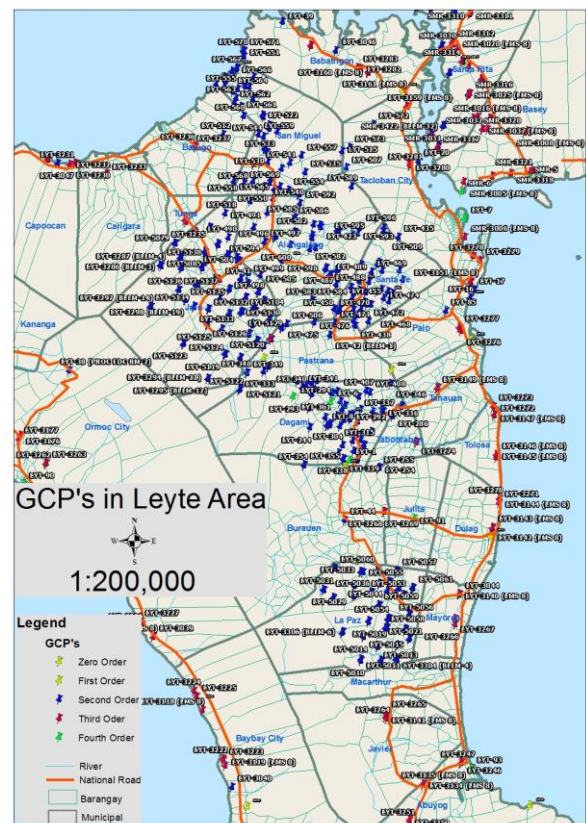


Figure 1-2-5 GCP (Geodetic Control Point) of NAMRIA in Leyte

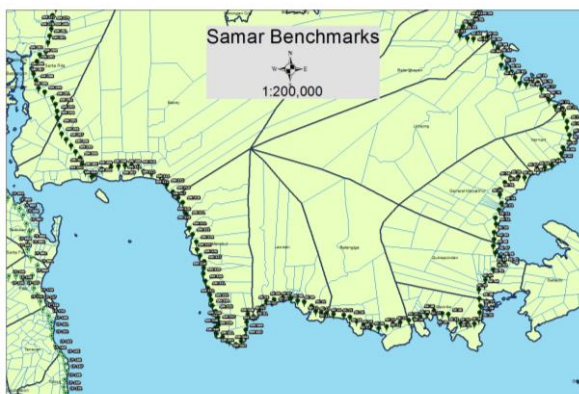


Figure 1-2-6 BM of NAMRIA in Samar

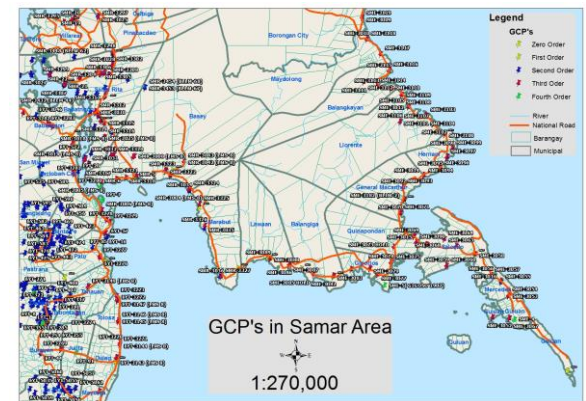


Figure 1-2-7 GCP (Geodetic Control Point) of NAMRIA in Samar

## 3) Progress of Surveying

The progress of surveying as of March, 2014 is as given in the following.

**Table 1-2-3 Progress Ratio of Surveying**

Description	Field Surveying (%)	Drawing and Report Making (%)	Progress as a whole (%)
Topographic Survey of Buildings	15 %	0	8 %

**(2) Results of Geotechnical Survey**

**1) Objects of Geological Survey**

As to the buildings, the geological surveys are to be performed in the same sites as the above surveying sites. The Core Boring Test and the Standard Penetration Test (SPT) are to be carried out, and the Particle Size Analysis of soils is to be carried out using the soil pieces obtained in the sites of office complexes.

As to the elementary schools and RHUs, the Dynamic Cone Penetration Tests (DCPT) are to be carried out.

**Table 1-2-4 Quantity of Core Boring**

Object	Numbers of Sites	Numbers of Points in Each Site	Total	Depth
Office Complex +RHU	2	3	6	15m

**Table 1-2-5 Numbers of Laboratory Tests (Particle Size Analysis of Soils)**

Object	Numbers of Borings	Length of Bore Hole	Estimated Numbers of samples per hole	Total
Office Complex +RHU	6	15m	2	12

**Table 1-2-6 Quantity of Dynamic Cone Penetration Test (DCPT)**

Object		Numbers of Sites	Numbers of Points in Each Site	Total	Depth
1	Elementary School	8	4	32	Max 3.5m
2	Medical Center	2	4	8	Max 3.5m
Total		10		40	

**2) Progress of Geological Survey**

The progress of geological survey as of March 2014 is shown in the table below.

**Table 1-2-7 Progress of Geological Survey**

Description	Field Survey (%)	Report Making (%)	Progress as a whole (%)
Dynamic Cone Penetration Test (DCPT)	10	0	8
Core Boring	10	0	8
Laboratory Test	10	0	8

## 1-3 Environmental and Social Consideration

### 1-3-1 Project Description

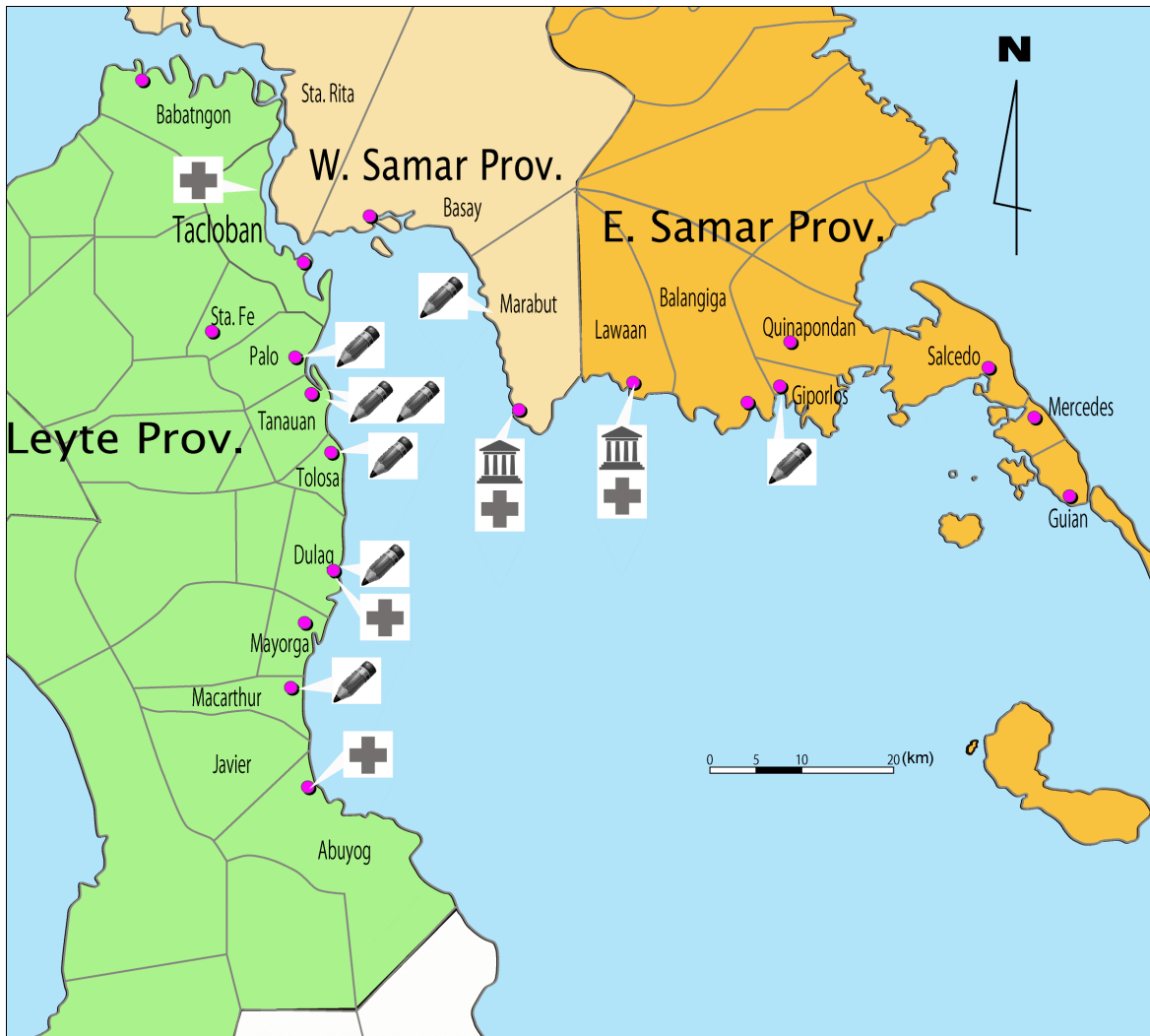
Planned projects being formulated by the JICA Study Team are listed in Table 1-3-1. They are all architectural components. Civil works such as roads, bridges, and seawalls which were originally planned are not included as the results of a comparison study. The usages of the buildings are: 6 schools, 2 government offices, and 5 medical facilities. All are rebuilding of damaged public facilities except the East Visayas Regional Medical Center (EVRMC) which will be transferred to other government owned plot.

Land acquisition is not necessary for all sites because the project sites are all government owned property, and involuntary resettlement will not occur either. The locations of the buildings are indicated in Figure 1-3-1.

**Table 1-3-1 List of Projects**

	Province	Municipality	Main Usage	Structure	Area	Remarks
<b>Education Facility (Elementary School: ES) Central ES: CES</b>						
1.	Leyte	Palo	Arado ES	RC, 1 story	8 Class rm, 705 sqm	-Rebuilding of existing school building at the same site; Safety shelter for an emergency evacuation
2.	Leyte	Tanauan	Sto Nino CES.	RC, 2 Stories (piloti)	8 Class rm, 853 sqm	-Rebuilding of existing school building at the same site; Safety shelter for an emergency evacuation
3.	Leyte	Tanauan	San Roque ES	RC, 2 Stories (piloti)	12 Class rm, 1,191 sqm	-Rebuilding of existing school building at the same site; Safety shelter for an emergency evacuation
4.	Leyte	Tolosa	CES	RC, 1 Story	6 Class rm, 536 sqm	-Rebuilding of existing school building at the same site; Safety shelter for an emergency evacuation
5.	Leyte	Dulag	CES	RC, 1 Story	6 Class rm, 536 sqm	-Rebuilding of existing school building at the same site; Safety shelter for an emergency evacuation
6.	Leyte	MacArthur	CES	RC, 1 Story	6 Class rm, 536 sqm	-Rebuilding of existing school building at the same site; Safety shelter for an emergency evacuation
7.	W. Samar	Marabut	Osmena CES	RC, 1 story	6 Class rm, 536 sqm	-Rebuilding of existing school building at the same site; Safety shelter for an emergency evacuation
8.	E. Samar	Gyporios	CES	RC, 1 story	8 Class rm, 705 sqm	-Rebuilding of existing school building at the same site; Safety shelter for an emergency evacuation
<b>Local Government Office (Municipal Office: MO)</b>						
1.	W. Samar	Marabut	MO (The same Site with RHU)	RC, 2 Stories (piloti)	829 sqm.	-Rebuilding of existing structure at the same site -Safety shelter for emergency evacuation; Piloti structure to avoid flood seawater; Emergency equipment stored
2.	E. Samar	Lawaan	MO (the same site with RHU)	RC, 1 story	829 sqm.	-Rebuilding of existing structure at the same site -Safety shelter for emergency evacuation; Piloti structure to avoid flood seawater; Emergency equipment stored
<b>Medical Facility (Eastern Visaya Regional Medical Center: EVRMC, Rural Health Unit: RHU)</b>						
1.	Leyte	City of Tacloban	Regional Health Center	RC, 3 Stories	4,500 sqm.	Planned in plot owned by DOH in Barangay Cabalawan
2.	W. Samar	Marabut	RHU	RC, 2 Stories (piloti)	680 sqm.	-Rebuilding of existing structure at the same site; Safety shelter for emergency evacuation; Piloti structure to avoid flood seawater; Emergency equipment stored

	Province	Municipality	Main Usage	Structure	Area	Remarks
3.	E. Samar	Lawaan	RHU	RC, 2 stories	680 sqm.	-Rebuilding of existing structure at the same site; Safety shelter for emergency evacuation; Emergency equipment stored
4.	Leyte	Dulag	RHU	RC, 2 Stories	680 sqm.	-Rebuilding of existing structure at the same site; Safety shelter for emergency evacuation; Emergency equipment stored
5.	Leyte	Abuyog	RHU	RC, 1 Story	680 sqm.	-Rebuilding of existing structure at the same site; Safety shelter for emergency evacuation; Emergency equipment stored



**Figure 1-3-1 Project Locations**

## 1-3-2 Screening

### (1) Philippine EIS System and Related Organizations

#### 1) Presidential Decree (PD) 1586: Philippine Environmental Impact Statement System (PEISS)

The law requires that all agencies and instrumentalities of the national government including government owned and controlled corporations as well as private corporations, firms and entities must prepare an environmental impact statement for every proposed project and undertaking which significantly affect the quality of the environment.

#### 2) DENR Administrative Order (DAO) 03-30: PEISS Implementation Guidelines and Procedures

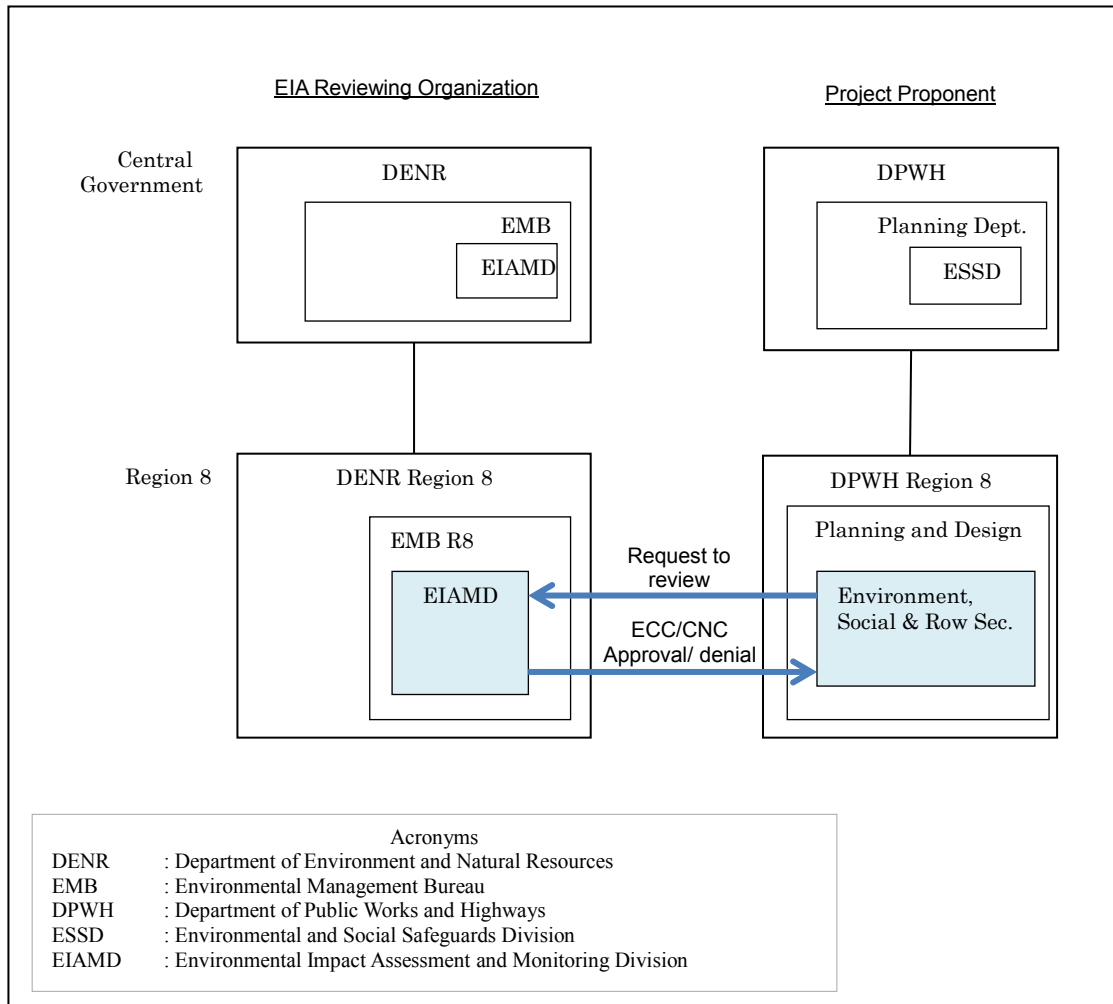
This DAO sets implementing rules and regulations of Presidential Decree 1586, the thresholds of EIS requirements in each project field are also clarified. If a project exceeds the limit, it is required to compile Initial Environmental Examination Checklist (IEEC) in order to obtain Environmental Clearance Certificate (ECC) from respective Environmental Management Bureau (EMB). On the other hand, if a project scale is below the limit, only filing of Project description (PD) is necessary to obtain a Certificate of Non-Coverage (CNC) which means EIS procedure is waived. Table 1-3-2 shows screening of the proposed projects. Formats being used by EMB for compiling PD and IEEC are attached as Annex-5 and Annex 6 respectively.

**Table 1-3-2 Screening Method by DAO 03-30**

Items	Scale Planned	Necessary applications	
		PD & IEEC	PD
Elementary Schools	Approx. 1,000 sq. m	>1 ha *total/gross floor area including parking and other areas	< 1 hectare
EVRMC	Approx. 4,500 m <sup>2</sup> No hospitalization facility with laboratory	If there are beds for hospitalized treatment or with laboratory	-
Rural Health Unit (RHU)	Approx. 680 sq. m No hospitalization facility but with laboratory		
Municipal Government Offices (MO)	Approx. 830 sq. m	>=1 ha *total/gross floor area including parking and other areas	< 1 hectare

It is recommended by EMB Region VIII, the responsible organization for reviewing the documents that all the components will not be required to file IEEC but PD. A diagram which describes relationship of PEISS related organizations for this project is shown in Figure 1-3-2.





Source: JICA Study Team

**Figure 1-3-2 PEISS Related Organizations**

**(2) Issue of CNC**

Necessary PD is submitted to EMB Region VIII. All works by project proponent was done by the end of March, and CNCs for all projects have been obtained on March 27, 2014 (15 CNCs, refer to Appendices 6, 7 and 8).

### 1-3-3 Environmental Impact Study for IEEC

Environmental impacts are being assessed by using the JICA Environmental and Social Consideration Guidelines. Site survey and studies are still being conducted and some more works are required to complete the checklist.

**Table 1-3-3 Impact Assessment by Environmental Impact Checklist**

	Entity which may receive impact	During Construction	During Operation	Justification
Social	1. Housing and real estate (land acquisition, involuntary resettlement)	D	D	There is no need for land acquisition and involuntary resettlement.
	2. Employment opportunity, livelihood	D	D	There is no impact on employment and opportunity since the original land use will not be changed.
	3. Land use plan, income sources	D	D	The same as "2. Employment opportunity" above.
	4. Community organization, tie in community	D	D	There are no impacts on community organization because land use will not be changed.
	5. Community service and facilities	D	D	The projects are to rehabilitate facilities of community services, and negative impacts are not expected.
	6. Socially weak people, vulnerable group, indigenous people, minorities	D	D	All facilities will be in existing government properties, and no displacement or impacts on socially weak people or groups are expected.
	7. Inequality in social cost and benefit	D	D	No social inequality will be expected because social cost will not be incurred in any segment of the surrounding communities.
	8. Historically/ culturally important place or buildings	D	D	There are no impacts on historical or cultural places or buildings because no new land is necessary.
	9. Social conflict	D	D	No social conflicts will be expected because there are no residents who receive direct impacts from the project.
	10. Water use/ water right, accustomed usage of water	D	D	No impacts on existing or customary use of water are expected because the new facilities will take over the same water utilization practice of existing ones.
	11. Quality of downstream water (sewerage treatment)	D	D	Law* stipulates that the pollution sources have responsibilities to maintain the effluent water within the water quality standard. *An Act Providing for a Comprehensive Water Quality Management and for Other Purposes (RA 9275)
	12. Sanitation and health environment (including transmitted disease)	D	D	The sites are in the inhabited area, and hence the impacts on health environment are limited.
Natural/ physical	13. Ground stability	D	D	No major earthworks will be necessary because the projects are reconstruction works, and plots are already prepared. The East Visayas Regional Medical Center (EVRMC) may require earthworks but ground stability will be secured since the site is in flat area.
	14. Soil erosion	D	D	There are almost no earthworks required in the sites, and soil erosions are not expected to occur.
	15. Groundwater	D	D	There will be no impacts on groundwater because the same practice as with the old buildings will be taken over by the new buildings.
	16. Natural flow of river/ discharge function	D	D	There are no impacts on surface water because the buildings are all in the existing sites for the same purpose.
	17. Coast and ocean	D	D	There are no impacts on the coastal area and offshore area because the buildings are all away from the coastal area.
	18. Flora and fauna/ biodiversity	D	D	There are no impacts on flora and fauna because the construction works will only be in the existing government plots.
	19. Local climate	D	D	The scales of architecture are too small to affect the surrounding climates during construction and in operation.
	20. Aesthetics	D	D	The sites are all in town areas, and the impacts on aesthetics are negligibly small during construction and in operation.

Entity which may receive impact	During Construction	During Operation	Justification	
21. Global climate	D	D	Production of greenhouse gas is negligibly small for causing global warming both in construction and in operation.	
Pollution	22. Air quality	D	D	Breaking down of the damaged structures may require heavy machinery and release the emission into the air; however, the impacts are negligible due to the duration is limited to a few days and number of machines are limited. Air pollution is not expected after completion.
	23. Water quality	D	D	None of facilities including RHUs and EVRMC have appropriate water treatment facilities as of now. New buildings must have water treatment facilities which can process discharging water to the level conforming to the Philippines's regulations.
	24. Soil degradation	D	D	There are no construction works and operation of the facilities that causes degradation of the soil
	25. Solid waste	D	D	Construction wastes will all be transferred to middle transporters, and no impacts are expected during construction phase. However, since the medical buildings produce healthcare wastes, the normal handling and segregation, transportation, and disposal needs to be conforming to the Manual on Healthcare Waste Management of DOH, and the necessary equipment and appropriate facilities must be provided.
	26. Noise and vibration	D	D	Noise and vibration occurs in a limited area and time during construction. They are negligibly small after completion of the facilities.
	27. Ground subsidence	D	D	There are no causes which trigger ground subsidence such as huge volume of continuous ground water extraction during construction and operation.
	28. Offensive odor	D	D	There are no causes of offensive odor during construction and operation.
	29. Sedimentation	D	D	There are no causes of sedimentation during construction and operation.
	30. Traffic accidents/ labor security	D	D	There are always possibilities of accidents at the construction sites. However, since the facilities to be constructed are relatively small and grounds are all flat, the construction sites are not defined as exceedingly insecure. There are no security problems after construction.

A+/-: Significant and irreversible impacts are expected

B+/-: Less significant impacts are expected

C: Impacts are not known but will be clarified as the study develops

D: No impacts or the impacts are negligibly small and no further measures are required

### 1-3-4 Alternatives

Alternatives are not sought for any of proposed projects. It is requested by the LGUs to rebuild their damaged facilities; therefore the plots and usages are the same as previous or existing ones. However, EVRMC alone will be relocated from the existing site to another government-owned land at higher ground level within Tacloban City.

### 1-3-5 Mitigation Measures

Significant environmental impacts are not foreseen by the IEE study; however, new facilities must be furnished with their own wastewater treatment system since there are no sewerage systems at any of the project sites. Likewise, healthcare wastes generated by RHUs and EVRMC must also be treated with appropriate types and scale of treatment facilities which are capable of conforming to the Philippines laws and guidelines.

[Effluent from RHUs and EVRMC]

- RA 9275: Clean Water Act of 2004
- DENR AO 1990-34 Revised Water Usage and Classification/Water Quality Criteria Amending Section Nos. 68 AND 69, Chapter III of the 1978 NPCC Rules and Regulations)
- DENR AO 1990-35: Revised Effluent Regulations of 1990
- PD 856 Refuse Disposal of the Sanitation Code of the Philippines [Chapter XVIII, Implementing Rules and Regulations]

[Healthcare Waste from RHUs and EVRMC]

- RA 6969 Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990
- DOH DAO 2004-36 : Revised Procedural Manual on Hazardous Waste Management (for RA 6969)
- DENR-DOH JAO 2005-02 (Joint Administrative Order No. 02, series of 2005, Policies and Guidelines on effective and proper handling, collection, transport, treatment, storage and disposal of health care wastes)
- DOH Manual on Healthcare Waste Management

## CHAPTER 2 Contents of the Project

### 2-1 Basic Concept of the Project

The projects which were selected as the Japan's grant aid project are as presented in the next table.

**Table 2-1-1 List of Japan Grant Aid Projects**

Items			Implementing Agency	Remarks	
1. Recovery of Basic Human Needs	Reconstruction of Elementary School		Facilities	1. DPWH 2. DepEd	
	Reconstruction of Medical Facilities	EVRMC	Facilities	1. DPWH	Building for Outpatients
		RHU Facilities	Facilities	3. DOH	4 locations
		RHU Equipment	Equipment	3. DOH	4 locations
Rehabilitation of Electricity Equipment		Equipment	4.DOE	Boom Truck with Bucket and Winch: 7 units Boom Truck with Digger and Crane: 7 units	
2. Recovery of Livelihood and Economic Activity	Recovery of Construction Equipment		Equipment	1. DPWH	Dump Truck, etc.
	Rehabilitation of Equipment for National Maritime Polytechnic		Equipment	5. DOLE	Fast rescue boat and Davits, etc.
	Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center		Equipment	6. DA	Sterilizer, etc.
3. Rehabilitation of Damaged Public Infrastructure	Rehabilitation of Equipment for Tacloban Airport		Equipment	7. DOTC	Airport Rescue and Fire Fighting Vehicles, etc.
4. Rehabilitation of Disaster Prevention System	Reconstruction of Local Government Office		Facilities	1. DPWH 8. DILG	2 locations

#### 2-1-1 Project Goals and Objectives

##### 2-1-1-1 Project Goals

In May 2010, the Disaster Risk Reduction and Management Act (DRRM Act) No.10121 was enacted and the National Disaster Risk Reduction and Management Council (NDRRMC) established as the determining agency on disaster management in the Philippines. Then in June 2011, the NDRRMC leading other agencies formulated the National Disaster Risk Reduction and Management Framework (NDRRMF). In February 2012, it developed the National Disaster Risk Reduction and Management Plan (NDRRMP). Hence a comprehensive disaster risk plan including prevention and mitigation added to the conventional post disaster response was established.

Also, according to the Philippine Development Plan 2011-2016 in the medium term, watershed conservation and efficiently and properly developing infrastructure are considered as the primary measures to reduce flood risk. The flooding prevention facilities have a priority to be constructed and risk reduction and management will be done from both structure and un-structure opinions.

Upon the damage by Typhoon Yolanda, the Philippines Government requested international assistance for quick recovery of infrastructure and local government functions as well as emergency relief to victims. On 18 December 2013, the government published the Reconstruction Assistance on Yolanda (RAY) based on the needs assessment survey conducted by itself. On the concept of Build Back Better, RAY indicated the basic policies to recover livelihood means and build a disaster resistant community through proper recovery and rehabilitation of infrastructure and public service.

In the recovery and rehabilitation stages, aside from Build Back Better, also the Philippines government is requesting a variety of assistance from international society for rebuilding a disaster resistant community. Japan has obtained lessons from the recovery on the Great East Japan Earthquake and is expected to provide technique recommendations on disaster mitigation measures such as zoning, hazard map making, land use planning, and design and material and construction methods to improve resilience of buildings.

Hence the overall goal of the project is to rebuild a disaster resistant community and society as well as Build Back.

### **2-1-1-2 Project Objectives**

#### **(1) Reconstruction of Elementary Schools**

The objective of the project is to construct facilities that are strong enough to withstand high winds and seismic activities, and that can function as emergency evacuation centers. The facilities shall be adequate in size to be flexible for future modifications, and common spaces shall be not only as a multipurpose space but also evacuation spaces. The facilities that are located close to shorelines shall have piloti on the ground floor and specified spaces, such as classrooms, on the second floor, which shall minimize future damage from high-tide and shall save local residents' lives. Normally, the piloti on the ground floor shall be shaded space, and shall be gathering and community activity spaces if it rains.

#### **(2) Reconstruction of Medical Facilities**

It must be a strengthened facility with protection against seismic and wind load, and generators installed to provide for emergency evacuees. The RHU shall be planned in an appropriate space for the future modification. The common space shall be added on the plan for the multipurpose universal floor as a first-aid station. A type of Piloti System can be considered to shift every room up from the 1st floor near seashores. Therefore it will be protected against flood by storm tide and it can minimize damages of the buildings, and it will be safe on the 2nd floor for neighboring communities. It will be usually utilized for the activities of some assemblage under the shadow, and comfortable in rainy days.

#### **(3) Rehabilitation of Electricity Equipments**

On November 8, 2013, Super Typhoon "Yolanda" hit Visaya district and neighboring areas in the Philippines. The power interruptions occurred extensively and it affected Filipino society and economy seriously. According to the Department of Energy (DOE), the total financial damage due to Super Typhoon Yolanda was estimated to be 4.92 billion PhP, and 34 ECs and 20 provinces were seriously affected. Each EC is utilizing subsidies and the calamity loan provided by the Filipino government as its procurement fund. Regarding heavy equipment for maintenance and construction work, some of them are in faulty condition and are nearly being scrapped due to the

storm surge caused by the Super Typhoon. Since it is difficult to tackle with such serious situation by the EC itself, other ECs, who are not so affected by the Super Typhoon, are assisting by lending heavy equipment and human resources. It would take a while to complete total restoration. Since power supply is important to support the social infrastructure, the early recovery of power distribution facilities is required in order to expedite recovery and rehabilitation in the social activities such as politics, economy, and culture. On this current background, this project targets Tacloban that is the center of politics and the economy in Leyte Island, and the coastal area around San Pedro and San Pablo gulf for the early recovery and rehabilitation from Super Typhoon “Yolanda” as a project goal. And the project objective is to contribute to the improvement of the capability of recovery for EC by providing heavy equipment required for prompt recovery for damaged power distribution facilities as an emergent assistance for the power distribution sector.

#### **(4) Recovery of Construction Equipments**

The goal of this project is to secure the immediate availability, adjustability and general versatility of the selected equipment as well as recovery of the construction equipment in order to reduce the damage when another typhoon which has the same strength as Typhoon Yolanda comes.

#### **(5) Rehabilitation of Equipments for National Maritime Polytechnic**

Due to the storm surge and high winds by the typhoon Yolanda, the education and training equipment which have been installed in each training building of the National Maritime Polytechnic (NMP) were severely damaged. For this reason, some equipment became unusable. And the function of the education and the training of NMP stopped. This means that seafarers will not be able to attend the education and the training adapted to STCW Convention. In other words, NMP was no longer able to achieve the purpose of its establishment which is improvement of skills and knowledge of seafarers.

As a result, NMP was unable to implement such training to present the certificates necessary to embarkation of seafarers. "To ensure employment opportunities for foreign ships of Filipino seafarers, to expand its workplace." is the goal of NMP establishment. However, the goal of the NMP can no longer be achieved.

The goal of this project is;

- To replace the training equipment that is no longer available due to the damage of typhoon Yolanda.
- To be able to implement the training that is necessary for seafarers by STCW Convention.

Upon achieving the goal, so that the training to obtain the certificates required for embarkation is resumed the boarding of foreign ships by seafarers from this region can be easy, while will contribute towards the economy of this region.

## **(6) Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center**

The Guiuan Marine Fisheries Development Center (GMFDC) is mandated to develop the fisheries industry of Eastern Visayas through production, research and extension activities, as well as manage and conserve the region's coastal resources. At present, the Center maintains five hatcheries for milkfish (*Chanos chanos*), blue swimming crab (*Portunus pelagicus*), sea cucumber (*Holothuria scabra*), donkey's ear abalone (*Haliotis asinina*) and giant clams (*Tridacna gigas*, *T. squamosa*, *T. derasa*, *T. crocea*, *Hippopus hippopus*). Except for milkfish, which supports fishermen directly through fry and fingerling assistance and distribution of excess eggs to satellite hatcheries, the other commodities are released in fish sanctuaries and marine protected areas through stock enhancement and reseeding activities to replenish depleting stocks. With these activities, an increase in fish catch is expected at adjacent fishing areas.

The Center also maintains the Regional Seaweed Nursery Farm in Barangay Ngolos and Pearl Island Experimental Farm in Kantikan Island, Barangay Trinidad, both in Guiuan, Eastern Samar. The seaweed nursery farm collects and maintains quality seaweed seedlings which are distributed to seaweed farmers; while at Pearl Island, it maintains the land-based and ocean nurseries for giant clams, and on-site pearl culture demonstration farm.

Further, the Center maintains hatchery support facilities such as Phycology Laboratory which cultures and maintains primary and secondary stocks of microalgae for seed production; a Fish Health Laboratory for fish disease monitoring and diagnosis; and fish cages for milkfish, snapper, grouper and pompano for broodstock development. The two laboratories are tapped by nearby hatcheries and fish farms for natural food production, disease diagnosis and water parameter monitoring.

Other activities at the Center include the following: 1) technology verification trials, 2) undertake assessment of coastal resources and provide information for resource management, 3) serve as information outreach site for the fishermen, 4) provide local government units with technical assistance on research and development projects and training programs, and 5) assist in researching commercialization projects.

However, sad to note, the Center was tremendously damaged during the onslaught of Typhoon Haiyan on November 8, 2013. Currently, the production has not yet restarted due to damaged facilities and equipment. The focus now is on rehabilitation; and GMFDC wishes to start its production and other functions the soonest to contribute to the development of fisheries, particularly in typhoon-hit areas, at a large-scale level.

## **(7) Rehabilitation of Equipment for Tacloban Airport**

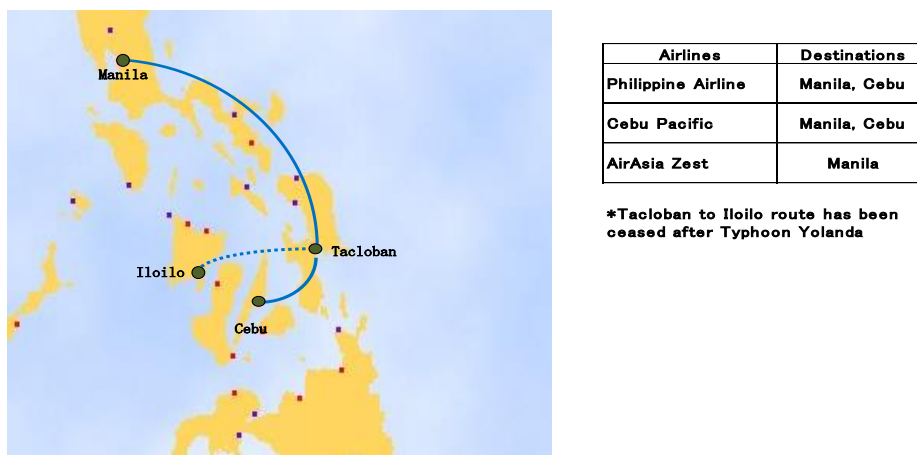
Tacloban Airport (Daniel Z. Romualdez Airport) is the largest airport on the Philippines island of Leyte, with a single 2,140 meter-long runway, and is the main gateway from Manila and Cebu to the Eastern Visayas Region in central Philippines. It is categorized as a Class 1 principal (major domestic) airport by the Civil Aviation Authority of the Philippines (DOTC/CAAP), the agency responsible for the operations of all airports in the Philippines excluding the major international



airports. As of 2013, Daniel Z. Romualdez Airport serves medium-sized passenger aircrafts of 179 seats and accommodates passenger volume of 1.4 million people; it was ranked as the eighth busiest airport of the commercial airports in the Philippines. All airport facilities such as the shoreline protection, passenger terminal building, control tower, navigation aids, airport administration building, and the rescue & firefighting facilities suffered great damage from the typhoon. Although the airport has now reopened to commercial flights regularly serving the airport, it may take a while before the facilities are fully restored. DOTC/CAAP has a plan to move the airport related facilities, like the destroyed passenger terminal building etc. from the existing runway to a more remote location. It currently has a problem concerning aviation safety and airport security because it presently depends on operation with the spare low-performance equipment etc. therefore, recovery of airport system as soon as possible is required for the secure safety service of the commercial flights.

The objective of the Project on Rehabilitation and Recovery from Typhoon Yolanda (hereinafter referred to as “the Project”) is to contribute to the level of safety and security at aerodromes to satisfy the international requirement by recovery of essential rescue and firefighting and security systems for aviation safety at the earliest possible opportunity and secure and maintain the safe operation of commercial flights in the Tacloban airport in order to maintain continuity of an aviation network and the regional economy activity.

Current commercial flight service routes and airlines in the Tacloban airport are as follows:



**Figure 2-1-1 Current Commercial Flights Service Route and Airlines in the Tacloban (Airport)**

(source : Philippine Airline)

**(8) Reconstruction of Local Government Offices**

The objective of the project is to construct facilities that are strong enough to withstand high winds and seismic activities, and that can function as emergency evacuation facilities. The facilities shall be adequate in size to be flexible for future changes and common spaces shall be not only a multi-purpose space but also evacuation spaces. The facilities that are located close to shorelines shall have piloti on the ground floor and spaces such as classrooms on the second floor, which shall

minimize future damage from high-tides and shall save local residents' lives. Normally, the pilot on the ground floor shall be shaded space, and shall be gathering and community activity spaces if it rains.

## **2-1-2 Project Outline**

### **2-1-2-1 Reconstruction of Elementary Schools**

The major damage to the elementary school buildings is blown off and broken roofs by the strong wind, followed by the destroyed structures by the pressure of the storm surge at the coastal areas. The primary reason that caused serious damage to the buildings is the extraordinary size of Typhoon Yolanda. However, the vulnerable structure of the buildings is the secondary reason of the damages.

Learning from the above mentioned fact and based on BBB (Build-Back-Better) policy, the Project aims to provide a model of the public facilities that are resilient against natural calamities that could happen again in the future. Therefore the Project supports re-construction of the educational facilities which have been strongly requested by the Government of the Philippines.

The basic education system in the Philippines is 6 years elementary school and 4 years high school. Normally, an elementary school compound has one or two kindergarten classrooms. As high school level is not compulsory education, the Project supports elementary schools for rehabilitation. The candidate schools for re-construction have been selected with the following procedure.

#### **(1) 1st Screening**

49 schools were selected based on the following data, and the Team conducted surveys on the building damage and interviews with the school staff.

- Operation Yolanda Report on Damage Sustained on School Building /Assessed by DPWH, other concerning agencies
- Typhoon Damage Report by Office of the DPWH District Engineer/DPWH
- Post Disaster Needs Assessment / Critical Infrastructures by Municipal Engineers

#### **(2) 2nd Screening**

After the site survey of 49 schools, we selected 8 project sites based on the following criteria.

- Schools that have buildings with serious damage and that has need of re-construction. The buildings that are usable after repair shall be excluded.
- Schools that have land ownership evidence, and located outside 40 m line from the coast (Non Build Zone).
- Schools that do not duplicate other donor's classroom construction.
- Schools that can take advantage of Japan's experience with rehabilitation and recovery, such as being a base of disaster prevention and evacuation center.

- Schools where sufficient beneficiaries are expected after the building construction.
- Schools for which the building construction goes along with the tight schedule of the emergency rehabilitation Project.
- Schools where the building construction is timely and harmonious with the other rehabilitation and recovery projects that are going on in the disaster affected area.

### (3) Result of Screening

As the result of the above mentioned screening process, the following sites have been selected as the candidate school sites for the Project.

**Table 2-1-2 Candidate School Sites (Elementary School)**

	Province	District	School Name
1	Leyte	Palo	Arado Elementary School
2	Leyte	Tanauan	Sto Niño Elementary School
3	Leyte	Tanauan	San Roque Elementary School
4	Leyte	Tolosa	Tolosa Central Elementary School (DZRMES)
5	Leyte	Dulag	Dulag South Elementary School
6	Leyte	Mac Arthur	Mac Arthur Central Elementary School
7	W. Samar	Marabut	Osmeña Elementary School
8	E. Samar	Giporlos	Giporlos Central Elementary School

### (4) Model Schools for Disaster Prevention

8 Project schools are designated as the “Model Schools for Disaster Prevention” and have the characteristics as follows.

- A: School far from the sea but located in front of the hill and damage was caused mainly by the strong wind: Arado ES, Palo
- B: School near the coast and has high possibility of storm surge during future mega typhoons: St. Niño ES, Tanuan/ San Roque ES, Tanuan
- C: School where many residents in the coastal areas are expected to evacuate to: Dulag South CES/ Tolosa CES(DZRMES)/ Osmeña ES, Marabut/ Giporlos CES/ Macarthur CES

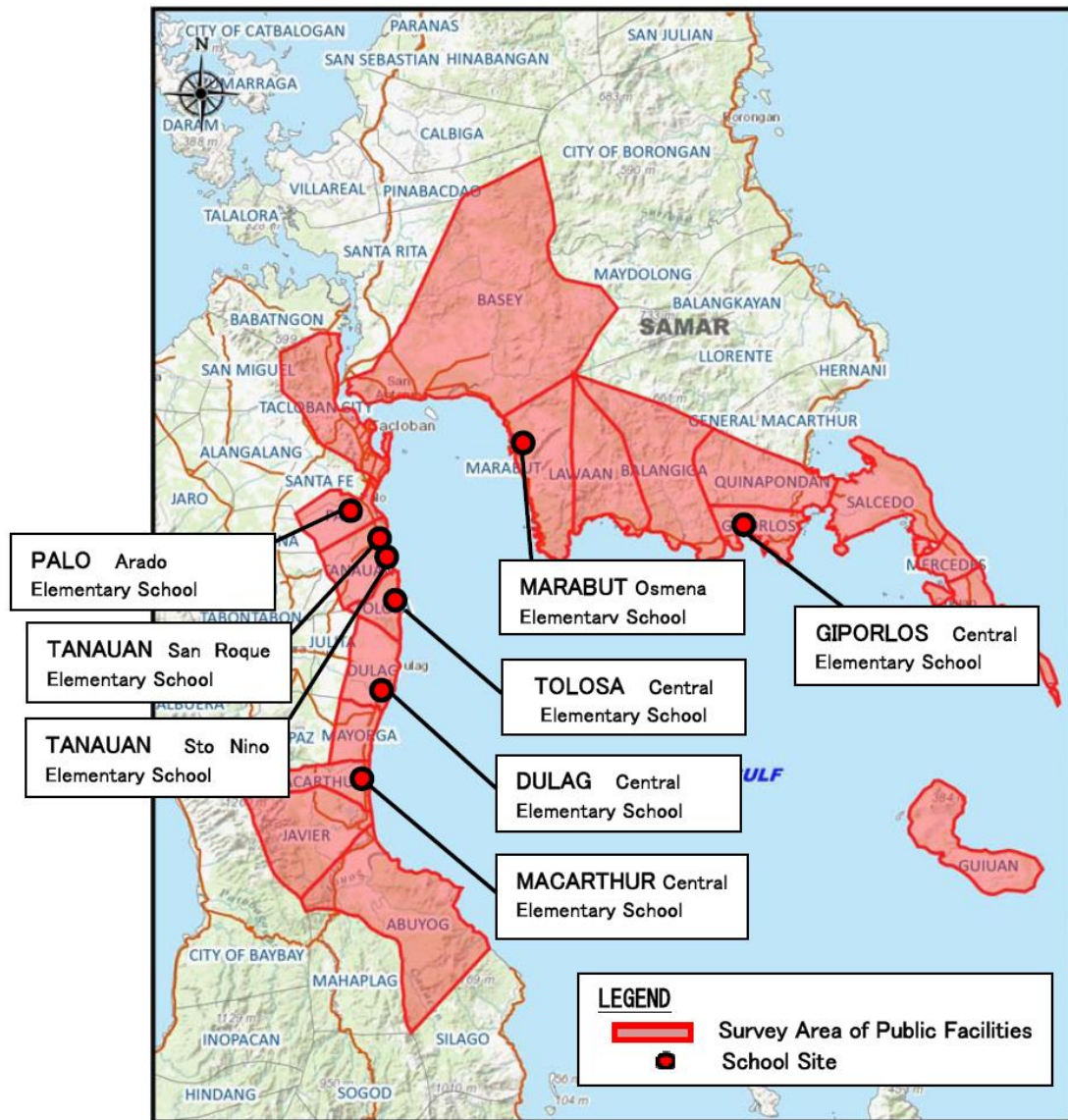


Figure 2-1-2 Location of Candidate Sites (Elementary School)

### 2-1-2-2 Reconstruction of Medical Facilities

#### (1) Existing Condition of Regional Health and Medical Facilities

Firstly, at the national level hospital, EVRMC (East Visaya Regional Medical Center: Level 2) is located in Tacloban city. Secondly, at the provincial level, a Provincial Health Office (PHO) is located in each Province. As the Local Government Unit (LGU) level, a Municipal Health Office (MHO) is located in each Municipality. MHO manages and operates LGU's health and medical policy as well. As the real and practical health and medical facility in rural areas is the Rural Health Unit (RHU), or District Health Center (DHC) in towns. They are serving the daily examinations, vaccinations, mother and infant care and various public health activities. Under RHU, there is a community level facility, BHS (Barangay Health Station). The main actor of BHS is a midwife and

they are doing daily mother and infant care and limited health consultation, but it is just at the community level.

EVRMC stands along the sea-shore, therefore, the hospital has been devastatingly hit by Typhoon Yolanda. But, this hospital had a long-standing plan to move and build a new one before this typhoon damage.

Land for the new hospital is under preparation, so that it seems to take a rather long time to be realized and also some difficulties remain to be solved.

It is, however, very urgent that the new hospital shall be constructed before the next disaster happens.

Under this condition, this project also studies how the support would be made to construct a part of hospital in the rehabilitation and recovery stage.

Similarly, RHUs, one of the important parts of regional health and medical network, need immediate assistance for construction. Accordingly, the reconstruction of such facilities, which has been devastated and totally malfunctioned so far, contributes to rebuild the regional network system as well as stations which can deliver the health and medical services timely and close to the regional inhabitants.

For selection of targeted RHU to be reconstructed, discussions have been undertaken with the Director of DOH in East Visaya, and established the consensus through the discussion with mayors of each municipality.

Field surveys have been done at RHUs of 17 municipalities in the project area and 4 RHUs in Tacloban city as well. These were based on the study reports described below.

- Yolanda Damage Report on Health Facilities / Department of Health, Eastern Visaya
- Post Disaster Needs Assessment / Critical Infrastructures by Municipal Engineers

## **(2) Medical Equipment**

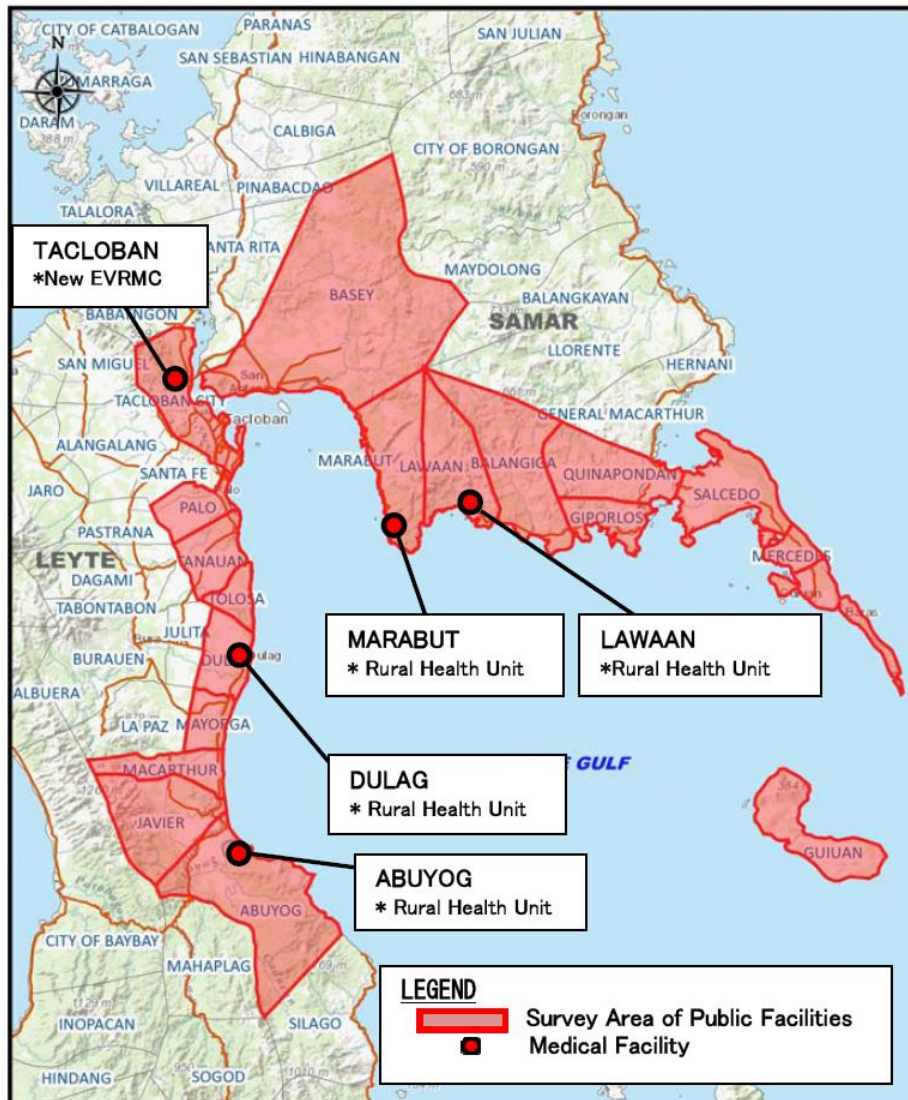
The disaster destroyed many RHU facilities and damaged most of the equipment of those facilities. The staff members have been managing to cater the services such as delivery care with a limited range of equipment in the tents which were temporarily set up or in the buildings which were prepared for emergency. However, it is still a difficult situation to restore the original level of the functions because laboratory equipment, ambulances and other required items are not available. This plan is aiming at recovering the bases of primary medical service supply by procurement of necessary equipment for new RHU facilities, which will be newly designed and constructed based upon the said policy, to respond to the regional medical care needs.

## **(3) Result of Selection**

Based on the above mentioned, the following site and facilities are selected

**Table 2-1-3 Candidate Sites (Medical Facility)**

	Province	District	Name
EVRMC (Eastern Visaya Regional Medical Center)			
1	Leyte	Tacloban	Outpatient Quarter in EVRMC (Relocation site)
RHU			
1	Leyte	Dulag	Rural Health Unit
2	Leyte	Abuyog	Abuyog II, Rural Health Unit
3	W. Samar	Marabut	Rural Health Unit
4	E. Samar	Lawaan	Rural Health Unit



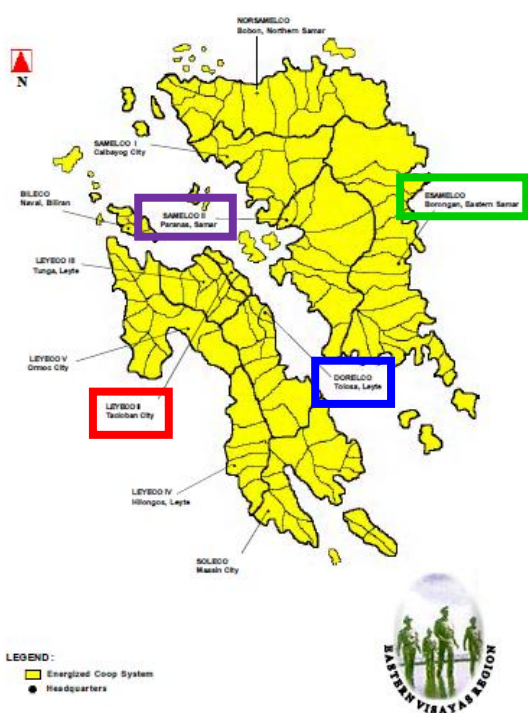
**Figure 2-1-3 Location of Candidate Sites (Medical Facility)**

**Table 2-1-4 Summary of Medical Equipment Plan (RHU)**

Item	Description
Laboratory items	Chemistry analyzer, Safety cabinet and so on,
Maternity items	Delivery table, Operating light and so on
Dental treatment items	Dental treatment unit, Dental forceps set, and so on,
Back-up devices	Solar power system
Transportation	Ambulance

### 2-1-2-3 Rehabilitation of Electricity Equipment

The most damaged EC, which supplies the northern and eastern part of Leyte Island with power, is Don Orestes Romualdez Electric Cooperative (Dorelco). The financial damage to Dorelco is 870 million PhP, comprising approximately 18% of total damage. Also, Leyte II Electric Cooperative (Leyeco II), which supplies Tacloban city and the neighboring areas with power, sustained 660 million PhP of damage, which amounts to approximately 13% of total damage. Furthermore, in the southern part and southeastern part of Samar Island, the power distribution facilities were heavily damaged due to storm surge as well, and those areas should be preferentially considered as a target for grant assistance based on the intention of the National Electrification Administration (NEA). Therefore, Samar II Electric Cooperative (Samelco II) and Eastern Samar Electric Cooperative (Esamelco), both of which supply those areas with power, should be selected. The damage cost for Samelco II is 125 million PhP, and for Esamelco it is 392 million PhP. Accordingly, Dorelco, Leyeco II, Samelco II, and Esamelco are ECs targeted for equipment provision through a grant assistance scheme in this project.



**Figure 2-1-4 Coverage Area for EC in Leyte, Samar, and Biligan Islands (Electricity, Region VIII)**

**Table 2-1-5 Targeted EC in Region VIII (Electricity)**

EC	Address	Households	Damaged Cost [PhP]
Dorelco	San Rouque, Tolosa, Leyte	59,292	870 million
Leyeco II	Real St. Sgkahan, Tacloban City, Leyte	67,674	660 million
Samelco II	Paranas, Samar	53,406	125 million
Esamelco	Cabong, Borongan, Eastern Samar	64,664	392 million

The equipment that is procured through this project is as follows:

#### (1) Boom Truck with Bucket and Winch

Boom Truck with Bucket and Winch is deployed for each EC for the purpose of repair and rehabilitation for damaged distribution facilities and construction work.

## **(2) Boom Truck with Digger and Crane**

Boom Truck with Bucket and Crane is deployed for each EC for the purpose of recovery of poles toppled down and re-erection of sloping poles, and construction work.

### **2-1-2-4 Recovery of Construction Equipment**

After Typhoon Yolanda hit Tacloban city and other municipalities, the first and most important work at the devastated area was to clean up the roads for emergency rescue activity. In the beginning of this work, the innumerable amount of debris caused by typhoon Yolanda had to be removed as soon as possible. UNDP, which was the first international aid donor to deal with the debris management among other donors, has provided 250 trucks a day in order to remove such debris cooperating with DPWH and other donors in their full efforts. The progress of debris management, however, is still ongoing even three months after the said typhoon.

Considering the situation aforementioned, the construction equipment will be procured and granted to DPWH Region-VIII office in order to achieve the project goals, i.e., “To support the early recovery activities in devastated areas through the facility reconstruction and equipment procurement, especially targeting prioritized activities with the aim of contribution to a disaster resilient society”.

Practically, 17 units of construction equipment (including 2 units of accessory equipment), which is useful for multi-purpose activities in an emergency event, are decided to be granted.

That additional equipment can contribute to the faster and wider emergency activity on some places simultaneously in the devastated area. Besides, it is definitely helpful to rescue the people’s lives within critical 72 hours by removing the debris immediately after a disaster.

### **2-1-2-5 Rehabilitation of Equipments for National Maritime Polytechnic**

NMP (National Maritime Polytechnic) is implementing a variety of short-term training related to the credentials required as seafarers. Therefore, as compared with other institutions for seafarers, NMP graduates a much greater number of students.

Table 2-1-6 shows the number of graduates in the most recent five-years and the number of qualification certificates. NMP conducted aggressive marketing activities, and provided a course based on the needs of shipping companies and merchant marine schools. The number of graduates is increasing every year in the last five years. In the past three years, the number of trainees was about 9,000, the number of credentials issued to them was about 20,000.





**Figure 2-1-5 Facility Location Diagram (NMP)**

These credentials associated with the STCW Convention are also included, it is shown that for students of the maritime school or seafarers in this region, NMP is the most important education and training center.

**Table 2-1-6 Number of Trainees and Issued Certificates in Each Year (NMP)**

Year	Number of trainees (People)	Issued certificates (piece)
2009	8,108	19,159
2010	7,953	19,064
2011	8,756	19,346
2012	9,230	20,317
2013	7,738	16,979

At present only 12 courses in total are being carried out (Deck 1, Engine 4, Safety 2 and Maritime 5). Because it carried out 33 courses in total before typhoon Yolanda, the number of courses decreased sharply to around one third. It is planned in the future, if equipment that can be used for the training were increased, to increase the training courses offered.

Some of the NMP training equipment could be restored to a usable state to some degree. On the other hand, there is also equipment that is completely lost.

As grant aid target range, the following selection criteria are given below.

- Education and training equipment required by the SOLAS Convention and STCW Convention.
- The education facilities which JICA donated in the past, and have been used effectively.

- Education and training equipment that can't be recovered by the local government and the Philippine government.
- Equipment to be used for training in accordance with the qualification certificate.

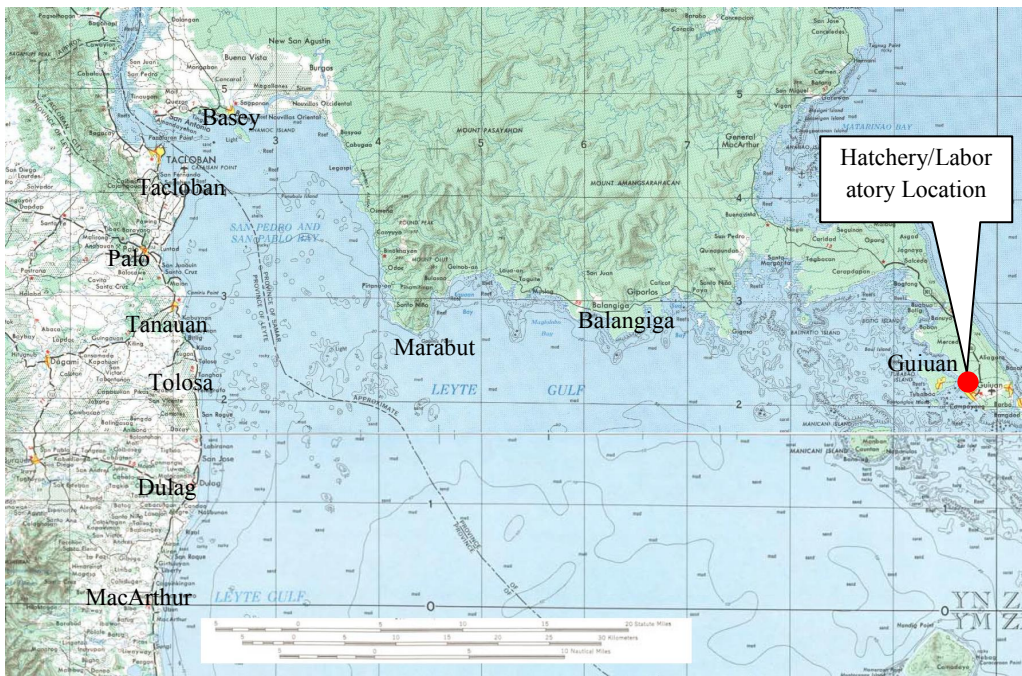
In addition to satisfying these criteria, equipment to be used for education and training related to the lives of seafarers and safe operation of the ship has been selected. These trainings are necessary for Filipino seafarers to board foreign vessels, including Japanese ships.

**Table 2-1-7 Overview of Equipment (NMP)**

Items	Remarks
Fast rescue boat and Davit	
Totally Enclosed Lifeboat and Davit	
Various Safety Equipment	
Full Mission Engine Room Simulator	
GMDSS simulator related equipments	GMDSS (Global Maritime Distress and Safety System)

**2-1-2-6 Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center**

It is the Guiuan Marine Fisheries Development Center (GMFDC) at Guiuan in Eastern Samar Island, which has a hatchery and laboratory facilities for hatching, culturing and researching many marine aquaculture species. It is also the biggest milkfish (bangus) and multi-species hatchery in Region VIII, and there are several facilities with a similar size all over the Philippines. The location of the target facility is given in the following figure.



**Figure 2-1-6 Location Map of Guiuan Marine Fisheries Development Center (GMFDC)**

The seed production activities of various hatcheries at GMFDC supply the needed seedstock for distribution and stock enhancement activities. Sadly, these laboratories and facilities were damaged by the Typhoon Haiyan, and need urgent rehabilitation. Below is the summary of activities and plans of each hatchery, laboratory and farm, as follows:

### **1) Milkfish Central Hatchery**

This hatchery is largest milkfish hatchery in the region; it is tasked to produce quality milkfish fry for fingerling production at different satellite stations region-wide. 21-day old fry are sold to fish farmers and private hatchery operators. Aside from the hatchery facilities, spawner tanks and floating cages for milkfish broodstocks are maintained as a source of fertilized eggs for the hatchery operation. There is also a program of providing fertilized eggs to private hatcheries and fishpond operators who go into fingerling production. This is an added income aside from growing them into marketable size.

For the production from January to October 2013, for instance, prior to the damage brought by Typhoon Haiyan, the hatchery was able to produce 4,719,000 fry. The hatchery plans to expand its operation to produce more fry to meet the increasing demand for milkfish fry and fingerlings.

### **2) Blue Swimming Crab (*Portunus Pelagicus*) Hatchery**

All the crablets produced in the hatchery are released in fish sanctuaries and marine protected areas for stock enhancement. The hatchery activities cover the spawning of wild-caught gravid female crabs in tanks to rearing of crablets (2-5 cm carapace width) ready for release. Prior to the onslaught of the typhoon last year, the Center was able to release 9,821 crablets to identified fish sanctuaries and marine protected areas region-wide. This hatchery also plans to increase and expand its production in order to release more crablets at different sites region-wide and for seed stock in the aquaculture.

### **3) Abalone (*Haliotis Asinina*) Hatchery**

In the abalone hatchery operation, the production covers the spawning of mature abalones to rearing of juvenile size ready for release. Prior to the onslaught of the typhoon last year, the GMFDC was able to release 16,000 juveniles to identified fish sanctuaries and marine protected areas in the region. This hatchery also plans to increase and expand its production in order to release more juveniles at different sites region-wide, and venture into aquaculture.

### **4) Sea cucumber (*Holothuria Scabra*) Hatchery**

The production covers the spawning of mature sea cucumber to rearing of 3-cm juvenile size ready for release. Prior to the onslaught of the typhoon last year, GMFDC was able to release 19,226 juveniles to marine protected areas and fish sanctuaries. Apart from the seed production facilities, the hatchery maintains a pen for broodstock maintenance. This hatchery also plans to increase and expand its production in order to release more juveniles at different sites region-wide, and venture into aquaculture.

### **5) Giant Clam Hatchery**

Five species of giant clams, such *Tridacnagigas*, *T. squamosa*, *T. derasa*, *T. crocea*, *Hippopus hippopus* are produced in the hatchery. The production covers the spawning of mature clams to rearing of >10 cm-juvenile size ready for release. The Center distributed 2,885 juveniles in 2013. This hatchery also plans to increase and expand its production in order to release more juveniles at different sites region-wide.

### **6) Scallop (*Decatopecten Radula*), Oysters, Groupers, Pompret and Mangrove Snappers**

Productions of seedlings are for aquaculture purposes.

### **7) Phycology Laboratory**

This laboratory cultures and maintains a number of primary and secondary stocks of microalgae for natural food production used in various seed production of priority commodities. Activities in this laboratory include isolation and purification of various microalgae, and maintenance and mass propagation up to 10 liters in carboy containers. Scale-up culture of microalgae in outdoor tanks is done by each hatchery, which is monitored by the staff of the laboratory to avoid possible contamination. This laboratory also plans to increase and expand its production in order to supply sufficient volumes of microalgae to meet the demand in each hatchery.

### **8) Fish Health Laboratory and Environmental Monitoring**

This laboratory conducts fish disease monitoring and diagnoses, and water parameters monitoring in the hatchery and culture facilities at GMFDC and aquaculture facilities of the fishermen. It also provides water, soil and feed analysis; contaminants; fish-shrimp microbiology analysis, toxins and antibiotic residues. It supports the fishermen's livelihoods through the provision of reliable laboratory data analysis/results and to assist the fishermen. Environmental assessments and monitoring are also provided to NGOs and other government agencies as input to develop strategies for climate change adaptation and resiliency.

### **9) Seaweed Tissue Culture Laboratory**

The laboratory is established to produce quality sporlings and as seedbank for the different seaweed species.

### **10) Regional Seaweed Nursery Farm**

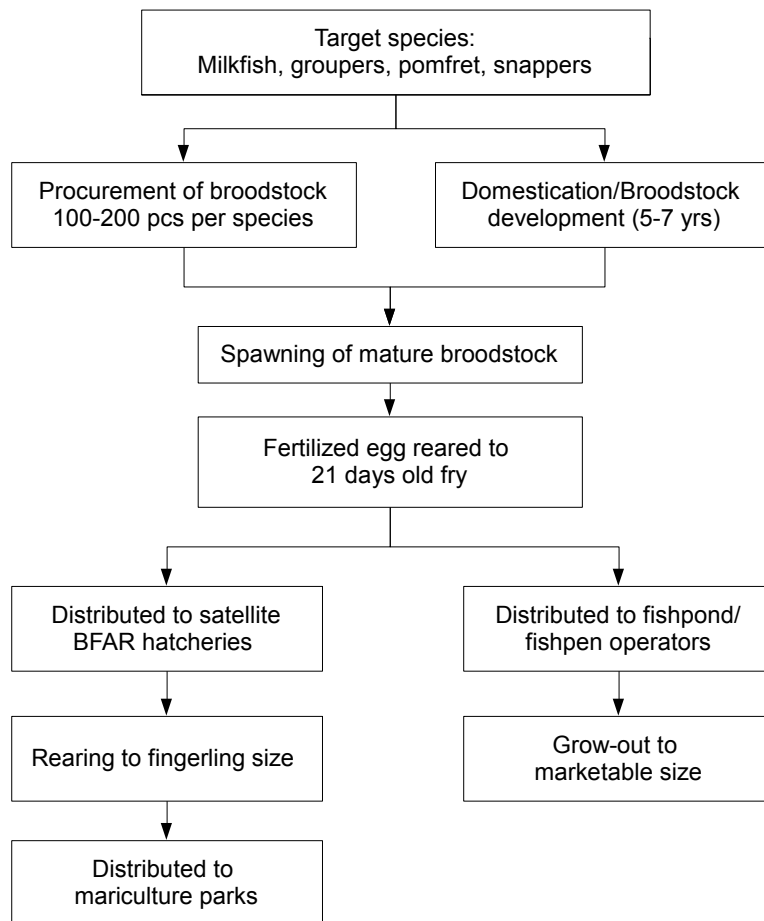
This farm is located in LCT, Barangay Ngolos, Guiuan, Eastern Samar; it produces and distributes quality seaweed seedlings to seaweed farmers. It also serves as the culture site for laboratory-produced propagules of BFAR seaweed tissue culture laboratories. It produces 6-10 tons of seaweeds per cropping (45 days per cropping).

### 11) Pearl Island Experimental Farm

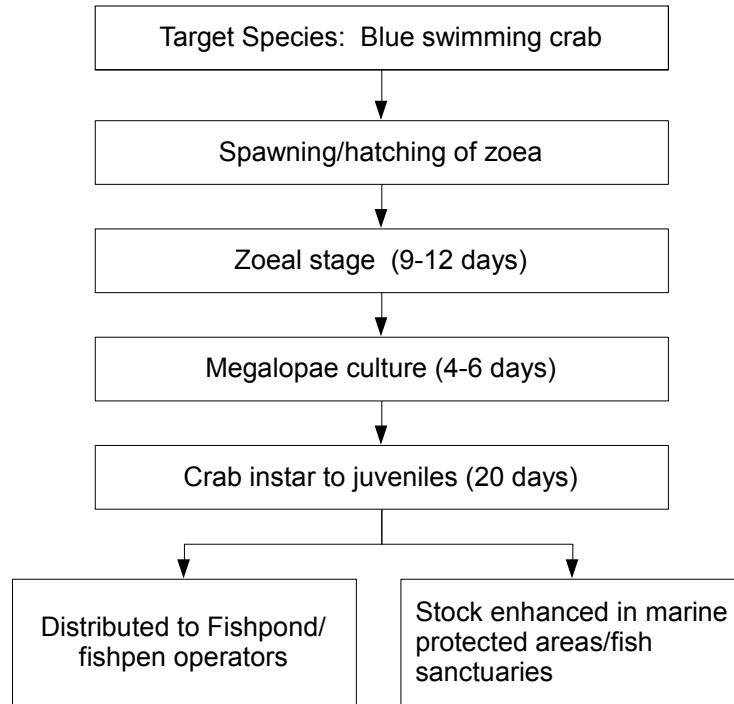
This farm is located in Kantikan Island, Barangay Trinidad, Guiuan, Eastern Samar. This farm plans to create an efficient nursery facility for pearl oysters and giant clams.

### 12) Administration

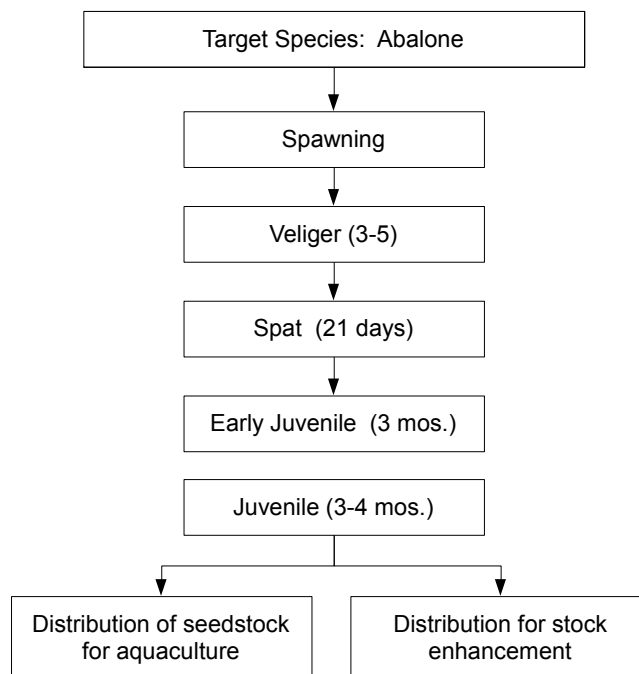
The administration supervises all the hatchery and laboratory facilities of GMFDC, and serves as the central data support system. It plans to fully manage the entire operation effectively, and have an efficient facility which will support the production.



**Figure 2-1-7 Production Flow for Finfishes (GMFDC)**



**Figure 2-1-8 Production and Distribution Flow for Blue Swimming Crabs (GMFDC)**



**Figure 2-1-9 Production Flow for Abalone (GMFDC)**

With the help of other kindhearted donors, BFAR intends to rehabilitate the buildings and facilities of the center. To supplement this initiative, this project will rehabilitate comprehensively by providing the lost equipment used in testing and maintaining supply of good marine water quality

as the basic requirement in the operation, particularly in the rearing/culturing of the mentioned aquaculture species including the culturing of natural food for the seedstocks in attaining the maximum potential productivity of good quality fish fry and fingerlings. The main equipment by activity is as given below.

**Table 2-1-8 Main Equipment by Activity (GMFDC)**

Activity	Main Equipment
1. Milkfish hatchery	High density Polyethylene cages (Circular, 10 meters diameter, 225 mm diameter UV Stabilized (HDPE) pipe)
2. Blue swimming crab hatchery	Microscope, trinocular (High luminescent white LED illuminator, CFI optical system)
3. Abalone hatchery	UV lamp complete with ballast and housing
4. Sea cucumber hatchery	Multi water quality parameter tester (DO, pH, ammonium, nitrate, chloride, salinity, TDS, barometric pressure)
5. Giant clam hatchery	Water pump (5 HP engine drive water pump)
6. Scallop hatchery	Fiberglass tank (1 ton, rectangular shape)
7. Phycology Laboratory	Sterilizer (For outdoor, high pressure UV light)
8. Fish health and environmental monitoring	Current meter (direct reading, with water temperature & salinity)
9. Seaweed tissue culture laboratory	Autoclave (Chamber Size: 420mm Dia. X 795 D mm, Capacity: 110 L)
10. Seaweed nursery	Ammonia Meter (Bench top, ISE range 0-19999 ppm, resolution up to 3 digit, accuracy $\pm$ .02 or .05% reading; pH range .1m.)
11. Pearl Island experimental farm	Solar panel (150 watts, 12 volts)
12. Administration (support to hatchery production)	Generator (1000kva, 220 Volts)

### 2-1-2-7 Rehabilitation of Equipment for Tacloban Airport

The Project will procure the rescue fire-fighting vehicles in compliance with international requirements and essential security equipment which are of urgent necessity also in the work concerning immediate rehabilitation of Tacloban airport for recovery of these systems and to attempt the strengthening of safety and security of aviation to achieve the objectives of the Project mentioned above. The rescue & firefighting that meets international requirements and proper security screening is expected to be implemented in Tacloban airport by this project.

The Project aims to procure the following equipment

#### (1) Airport Rescue and Fire Fighting Vehicles

Airport rescue and fire fighting vehicles are to be installed at firefighting facilities so that necessary measures can be taken immediately in the event an aircraft accident occurs.

## **(2) Hold Baggage X-ray Inspection System**

Hold baggage X-ray inspection systems are to be installed at check-in areas to inspect for weapons and explosive contained in the checked baggage.

## **(3) Cabin Baggage X-ray Inspection System**

Cabin baggage X-ray inspection systems are to be installed at the entrance of the boarding area to inspect for weapons and explosives contained in the cabin baggage.

## **(4) Walk-Through Metal Detector**

Walk-through metal detectors are to be installed together with the X-ray inspection system to inspect for weapons are hidden on a passenger's body.

### **2-1-2-8 Reconstruction of Local Government Offices**

Regarding the damage situation of buildings, loss or damage of the roof due to wind accounted for the majority. In addition to that, the building collapsed due to storm surge occurred often in areas of low elevation. Even though the primary factor with a larger damage of the buildings is the force of the typhoon, the remarkable second factor is the vulnerable structure of the building.

Based on the lessons of past disasters, under BBB (Build-Back-Better) policy, this project supports the reconstruction of the public facilities to protect against the threats of nature that will occur in the future, which were strongly requested by the Philippine government by constructing the facility such as a model of public facilities to withstand disasters.

Because it is the local government that plays a leading role in the restoration and reconstruction of industry and lives of victims, it is the key point to promote functional recovery of the government early for carrying out the operations to increase the speed of recovery. This project will carry out the reconstruction of local government buildings in order to support the administrative activities. Target facilities to be reconstructed are those that can't be repaired because of damage due to aging of the main structure. These will be rebuilt as model government buildings and as a shelter for the time of the disaster and this will make a significant contribution as a base for regional disaster prevention.

The field survey was carried out at 17 Municipalities except Tacloban City on the basis of the investigation report of the following by interviews with stakeholders.

- Typhoon Damage Report by Office of the DPWH District Engineer / DPWH
- Post Disaster Needs Assessment / Critical Infrastructures by Municipal Engineers

After the site survey, we selected 2 project sites based on the following criteria.

#### **(1) Criteria**

- Sites that have buildings with serious damage and that have need of re-construction. The buildings that would be usable after repair shall be excluded.
- Sites that have land ownership evidence, and located outside a 40 m line from the coast



(Non Build Zone).

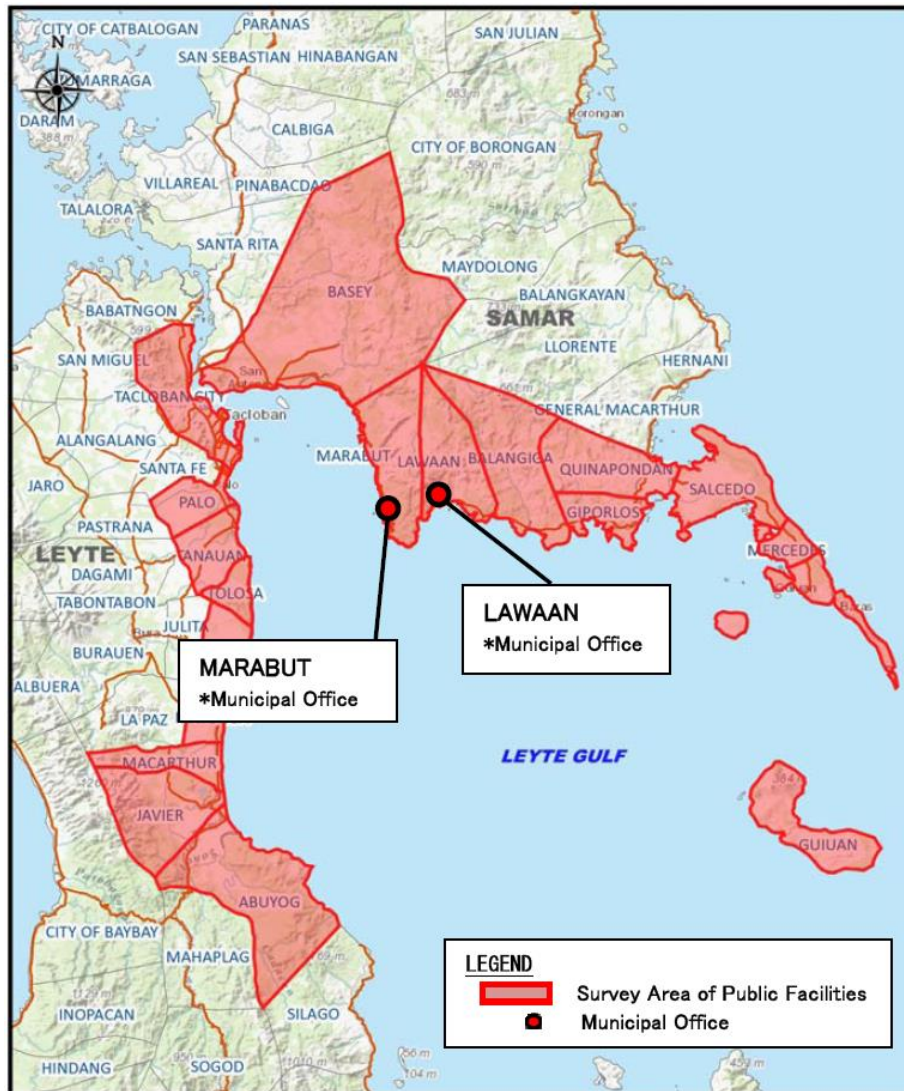
- Sites that do not duplicate other donor's construction.
- Sites that can take advantage of the Japan's experience in rehabilitation and recovery, such as disaster prevention and evacuation centers.
- Sites where sufficient beneficiaries are expected after the building construction.
- Sites in which the building construction goes along with the tight schedule of the emergency rehabilitation Project.
- Sites where the building construction is timely and harmonious with the other rehabilitation and recovery projects that are going on in the disaster affected area.

## (2) Result of Screening

As the result of the above mentioned screening process, the following sites have been selected as the candidate Municipal Office sites for the Project.

**Table 2-1-9 Candidate Sites (Local Government Office)**

Location & Name of Facility			
<b>Local Government Office</b>			
1	W. Samar	Marabut	Municipal Office
2	E. Samar	Lawaan	Municipal Office



**Figure 2-1-10 Site Map of Candidate (Local Government Office)**

## **2-2 Outline Design of the Japanese Assistance**

### **2-2-1 Reconstruction of Elementary Schools**

#### **2-2-1-1 Design Policy**

After the discussion with related organizations and site surveys, based on the following design policies, we have started to design the school buildings as shown in the table below.

Policy-1: The following codes, standards, guidelines and manuals are principally used in establishing design conditions of structures:

- General Regulation: National Building Code of the Philippines (NBCP)
- Fire Code of the Philippines (FCP)
- Structural Regulation: National Structural Code of the Philippines

– Supplementary applicable Japanese practice for building safe structures

Policy-2: Construction methods, materials and so on shall be the “Model” when the Government of the Philippines will extend the similar projects in the future.

Policy-3: Buildings shall be resilient against earthquake, wind, storm surge and others.

Policy-4: Buildings shall have a function as the emergent evacuation space where neighboring residents evacuate to.

**Table 2-2-1 Selected Sites (Elementary School)**

Location & Name of Facility				Building Type	Target Size
1	Leyte	Palo	Arado Elementary School	RC, single story	8 class room 705 sqm
2	Leyte	Tanauan	Sto Niño Elementary School	RC, 2 stories (Piloti)	8 class room 853 sqm
3	Leyte	Tanauan	San Roque Elementary School	RC, 2 stories (Piloti)	12 class room 1,191 sqm
4	Leyte	Tolosa	Tolosa Central Elementary School (DZRMES)	RC, single story	6 class room 536 sqm
5	Leyte	Dulag	Dulag South Elementary School	RC, single story	6 class room 536 sqm
6	Leyte	Mac Arthur	Mac Arthur Central Elementary School	RC, single story	6 class room 536sqm
7	W. Samar	Marabut	Osmeña Elementary School	RC, single story	6 class room 536 sqm
8	E. Samar	Giporlos	Giporlos Central Elementary School	RC, single story	8 class room 705 sqm

## 2-2-1-2 Basic Plan

### (1) Site Survey

The Team conducted site surveys again for the candidate 8 schools selected in the previous section. The result of the surveys is shown in the following table.

**Table 2-2-2 Site Survey Result (Elementary School)**

	1	2	3	4	5	6	7	8	
Province	Leyte	Leyte	Leyte	Leyte	Leyte	Leyte	W. Samar	E. Samar	
District	Palo	Tanauan	Tanauan	Tolosa	Dulag	Macarthur	Marabut	Gyorlos	
School Name	Arado Elementary School	St. Niño Elementary School	San Roque ES	Central Elementary School (DZRMES)	South Central Elementary School	Central Elementary School	Osmeña Elementary School	Central Elementary School	
No. of Students	Kindergarten	54	71	88	66	146	93	55	132
	G1	52	111	137	119	170	107	69	244
	G2	60	88	144	108	207	91	89	190
	G3	42	66	104	108	178	95	93	206
	G4	34	79	109	111	174	87	81	155
	G5	23	62	88	113	223	82	83	169
	G6	26	74	77	111	223	95	78	162
	Elementary total	237	480	659	670	1175	557	493	1126
Total	291	551	747	736	1321	650	548	1258	
No. of Teachers	7	14	16	24	29	23	15	35	
No. of Rooms before Yolanda / No. of Rooms Unable to Repair	Kindergarten	1/1	1/1	2/2	2/2	2/0	2/0	1/0	2/1
	Elementary	7/5	17/17	15/15	23/7	29/1	19/3	14/3	36/10
	Special CLRM	1/0	2/2	2/2	3/2	5/1	3/3	2/1	2/1
	JICA building	0	0	0	0	0	0	0	0
	JBIC building	3	3	3	3	3	3	0	3
Toilet booths	8	19/19	20/20	16/7	29/1	19/3	21/8	40/8	
Construction Plan by other donoors	0	10 CLRM (Inter Plan)	0	0	0	0	0	0	
Tome form Tacloban	30min	45min	45min	50min	60min	90min	60min	120min	
Site Condition	Site area (m <sup>2</sup> )	4,200	9,200	5,500	10,500	45,000	17,700	17,300	11,500
	Land title		Lost		Lost				Yes
	Storm surge & Flood height	30cm	5m	5m<	70cm	30cm	60cm	partially 1m	60cm
	Undulation	Almost flat	Flat	Flat	Flat	Flat	Flat	Gentle slope	Flat
	Sorrounded by	Hills	Residential	Residential	Mountain and city hall	Residential	Residential	Residential	Residential
	Soil caracter	Rock exposed			Sand				
Infrastructure	Electricity	Non	Yes	Non	Non	Non	Yes	Non	Non
	Water	City water	Non	City water	City water	Well	Well	Well	Well
	Sewerage	Non	Non	Non	Non	Non	Non	Non	Non
	Landline phone	Non	Non	Non	yes	Non	Non	Non	Non
	Cell phone	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**(2) Classrooms Plan**

Based on the survey result, the number of planed classrooms is calculated as follows.

## 1) Preconditions

### a) Enrollment of Elementary School (G1 – 6)

Although the enrollment has been slightly reduced after Yolanda due to temporary evacuation, it was confirmed through the interview that most students will return to their schools in the near future. Therefore we use the statistics just before Yolanda. Further, we do not conduct enrollment projection because the enrolment is almost stable in recent years.

### b) Number of Students Per Class

40 students per class is applied according to the standard of DepEd.

### c) Shift System

Single shift (full-time) system is applied because this system is common in Region VIII.

### d) Kindergarten

As kindergarten is required in the elementary school compound according to the new education curriculum, the kindergarten classrooms which cannot be repaired due to severe damage shall be included in the Project for re-construction.

### e) Special Classrooms

If a home economics room, an industrial arts room, a computer room, and so on had severe damage and cannot be repaired, they shall be included in the Project for re-construction.

### f) Multipurpose Room

Administrative rooms such as principal's room, office, store, library and conference room have also been damaged seriously. However, as the damaged floor area and necessary functions depends on the school, we plan one multipurpose room of the same size of the classroom uniformly for each school.

## 2) Calculation Method

a) Necessary classrooms for G1-6

= Sum of <Enrolment of each grade / 40 (round up) > -A

b) Number of G1-6 classrooms without damage, usable after repair and to be constructed by other donors -B

c) Number of kindergarten rooms totally destroyed and unable to repair - C

d) Number of special classrooms totally destroyed and unable to repair - D

e) 1 multi-purpose room is provided for each school E=1

f) Number of planed classrooms = A – B + C + D + E

- g) To keep an appropriate project scale and to avoid the concentration of classroom construction in particular schools, we set an upper limit on the number of classrooms to be constructed in each school.  $6 \text{ grades} \times 2 \text{ classrooms} = 12 \text{ classrooms}$  is the maximum.
- h) From the building design point of view, the number of classrooms shall be an even number. If the number of planned classrooms is an odd number, one classroom shall be subtracted from it. As the result, the classroom buildings are 3 types, 6-classroom-unit, 8-classroom-unit and 12-classroom-unit.
- i) If the number of planned classrooms calculated in f) is cannot be put into practice due to the reason of g) and/or h), the priority among the rooms are as follows.

G1-6 classroom > kindergarten classroom > special classroom > multipurpose room

**Table 2-2-3 Number of Classrooms Calculation (Elementary School)**

Province	Leyte	Leyte	Leyte	Leyte	Leyte	Leyte	W. Samar	E.Samar		
District	Palo	Tanaua	Tanaua	Tolosa	Dulag	Mac	Marabut	Gporlos		
School Name	Arado ES	Sto Niño ES	San Roque ES	CES (DZRMES)	Dulag CES	Mac Arthur CES	Osmeña ES	Giporlos CES	Total	
Kindergarten Enrollment	54	71	88	66	146	93	55	132	705	
Elementary School Enrollment	237	480	659	670	1175	557	493	1126	5397	
Classrooms needed for G1-6	A 9	14	19	18	33	18	16	32	159	
No. of G1-6 classrooms	Before Yolanda	7	17	15	23	29	19	14	36	160
	Repair impossible	5	17	15	7	1	3	3	8	59
	Repair possible or another donor's plan	B 2	10	0	16	28	16	11	26	109
Kindergarten classrooms	Before Yolanda	1	1	2	2	2	2	1	2	13
	Repair impossible	C 1	1	2	2	0	0	0	1	7
Special classrooms	Before Yolanda	1	2	2	3	5	3	2	2	20
	Repair impossible	D 0	2	2	2	1	3	1	1	12
Multipurpose room (one room)	E 1	1	1	1	1	1	1	1	8	
Planned number of classrooms	9	8	24	7	7	6	7	9	77	
Number of classrooms to be constructed	8	8	12	6	6	6	6	8	60	
G1-6 classrooms	7	4	12	2	5	2	5	6	43	
Kindergarten	1	2	0	2	0	0	0	1	6	
Special classrooms	0	1	0	2	1	3	1	1	9	
Multipurpose rooms	0	1	0	0	0	1	0	0	2	
Number of floors	1	2 (piloti)	2 (piloti)	1	1	1	1	1	1	
Ground floor level from natural ground	50cm	50cm	50cm	100cm	50cm	75cm	50cm	75cm		
Second floor level from natural ground	-	350cm	350cm	-	-	-	-	-		

### (3) Toilet Plan

It is specified in DepEd standard that the total number of toilet booths and urinals shall be the same as the number of classrooms. However, as more people are estimated to gather to the facilities in case of disaster than the normal time used as the school, the additional toilet booths and urinals shall be planned. According to the classroom block types, we provide 3 types of toilet blocks.

**Table 2-2-4 Toilet Block Types (Elementary School)**

Type	Girls disabled	Girls bowls	Boys disabled	Boys bowls	Boys urinals	Total
S for 6 classrooms	1	3	1	1	2	8
M for 8 classrooms	1	4	1	1	3	10
L for 12 classrooms	1	6	1	2	4	14

#### **(4) Furniture Plan**

A lot of school furniture has been lost due to the storm surge. Some classes are conducted by using what little furniture remained in the temporary classrooms while others are conducted with children who sit down directly on the ground inside the tents. Even in those schools where storm surge was not recorded, as most roofs were blown off, furniture has been damaged by the rain. Therefore, this Project provides a standard amount of school furniture no matter what the remaining furniture's conditions are.

##### **1) G1-6 Classroom**

According to DepEd standard, 20 two-person desks, 40 student's chairs, 1 set of teacher's desk and chair, 7 shelves for 6 pupils, a teacher's cabinet, a blackboard and a bulletin board per a classroom shall be provided. Student's desk and chair shall be 2 sizes, small for G 1-4 and large for G 5-6 respectively.

##### **2) Special Classroom**

There is no DepEd standard of furniture for special classrooms such as home economics room, industrial arts room and computer room. And special classrooms may be converted into ordinary classrooms if enrollment increases in the future. Taking these factors into consideration, the furniture for the special classroom shall be the same as the ordinary classroom

##### **3) Kindergarten**

10 three-person trapezoid desks, 30 plastic chairs, 1 set of teacher's desk and chair, and 5 shelves for 6 pupils, a teacher's cabinet, a blackboard and a bulletin board per a classroom shall be provided.

##### **4) Multipurpose Room**

A classroom size room shall be provided as a multipurpose room. Furniture and partition walls are not provided by the Project so that the recipient schools are able to layout rooms freely by themselves.

#### **2-2-1-3 Design of the Facilities**

##### **(1) Structural Design**

In order to provide more resilient classrooms to function as evacuation spaces in case of calamities, in the Project, we'll design school buildings by adding Japanese structural design factors to the Philippine structural design code. As the result, the quantity of the major structural materials such as concrete and re-bar is 20 -30% more than that of DPWH standard buildings.

## **(2) Architectural Design**

### **1) Roof Design**

To secure more resilient roofs against strong wind pressure, JICA buildings adopt the following methods.

#### **a) Concrete Ridge Frame**

To prevent the damage to the steel truss, we introduce concrete ridge frame into JICA buildings. The sloped ceilings along the ridge frame shall maximize its air space with minimized floor-to-floor height, which keeps the classroom cool and comfortable.

#### **b) Roof Material**

We apply 0.6 mm thick galvalume (aluminum and zinc - plated) iron sheets taking the advantage of durability and weather-proofing into consideration.

### **2) Central Corridor Classroom Building**

The size of the classroom shall be 9mx7m according to DepEd standard design. Instead of the conventional single row classroom building, we apply a double row classroom building with a wide central corridor, so that the people are able to evacuate safely to the space from strong wind and rain.

### **3) Piloti**

In order to minimize the number of the victims in the school sites close to the coast where high storm surges were recorded during typhoon Yolanda, we'll elevate the floor of the classrooms / shelter to the second floor level. And we'll install a ramp for disabled up to the second floor. Then, the ground floor is a piloti space. In the normal time, the piloti can be utilized as the shaded multi-purpose space for meetings, children's play and etc. free from the rain and the strong sunshine.

For those schools where piloti is not applied, the floor level shall be elevated enough against flooding.

### **4) Movable Partition**

According to the DepEd Standard, at least one movable partition that connects two classrooms, which can be used for school activity or as community gathering space, is required. Therefore, the movable partitions shall be a part of the design.

### **5) Toilets**

In accordance with DepEd's new school design standard, all toilet fixtures shall be western style. Urinals shall be individual-type ceramic fixtures. For wheel-chair access, the ramp and universal



toilet space shall be provided for both girls' and boys' toilet blocks. And, storm water from the roofing area of the toilet block shall be collected and stored in the storage tank, which is used for toilet booths and hand-basins. City water supply pipes shall be connected to the water tank if possible. If the city water supply is not available, a water inlet opening and access stairs shall be provided so that the tank can be filled manually with buckets from the well.

Since there is no city sewage system in the areas at 8 school sites, sewage shall be collected into a septic tank and seeped into the ground through a seepage pit.

### (3) Electrical work

Fluorescent lights are installed in the rooms, corridors and toilets and outlets are installed in the classrooms.

### (4) Furniture

Furniture which is made out of wood panel and steel pipe shall be selected since it is the most common, durable, and easily maintained.

### (5) Facility Outline

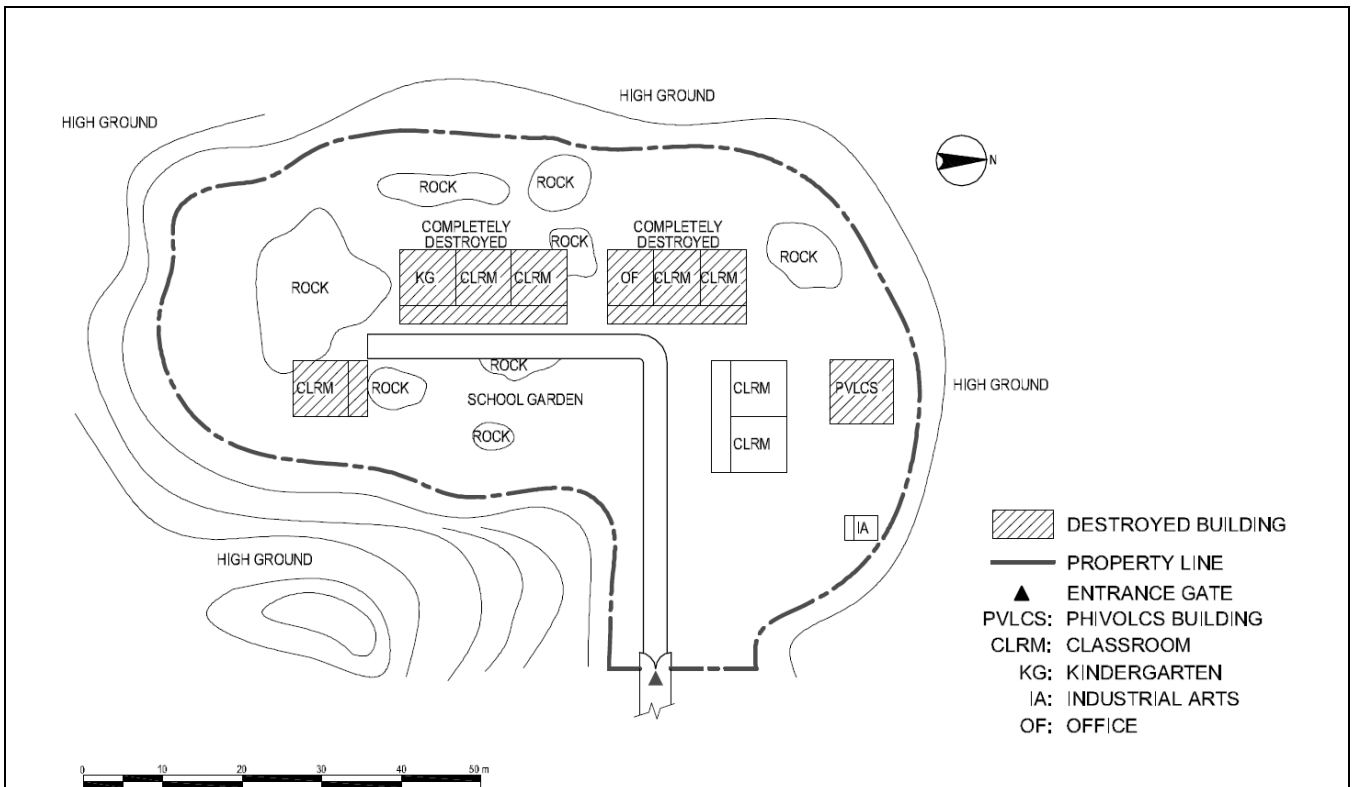
Facility outlines of the 8 sites are as follows:

**Table 2-2-5 Facility Outline at Each Site (Elementary School)**

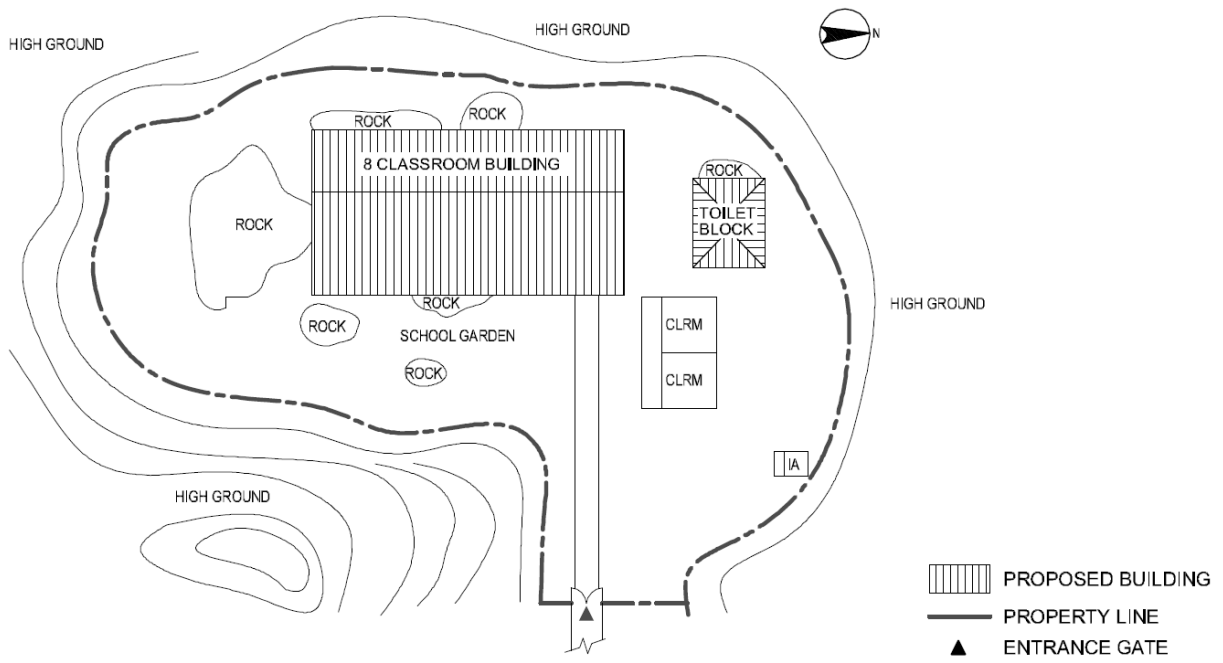
School Name	Arado ES	Sto Niño ES	San Rogue ES	Tolosa CES (DZRMES)	Dulag CES	Mac Arthur CES	Osmena ES	Giporlos CES	Total
Total No. of Classrooms	8	8	12	6	6	6	6	8	60
Regular room	7	4	12	2	5	2	5	6	43
Kindergarten	1	2	0	2	0	0	0	1	6
Special room	0	1	0	2	1	3	1	1	9
h Multipurpose room	0	1	0	0	0	1	0	0	2
Story	1	2 (piloti)	2 (piloti)	1	1	1	1	1	-
Ground floor level	50cm	50cm	50cm	100cm	50cm	75cm	50cm	75cm	-
Second floor level	-	350cm	350cm	-	-	-	-	-	-
Toilet block size	Medium	Medium	Large	Small	Small	Small	Small	Medium	-

#### 2-2-1-4 Outline Design Drawing

The outline design drawing is given below.



EXISTING SITE PLAN

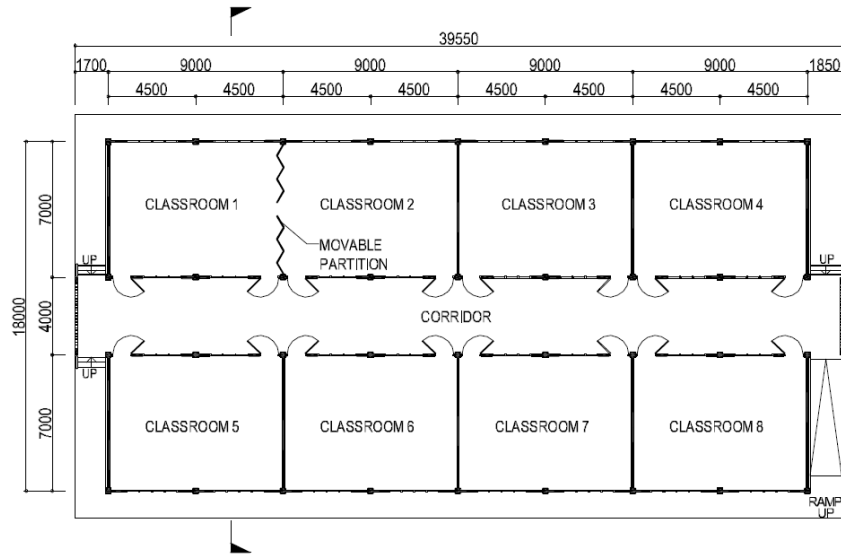


PROPOSED SITE PLAN

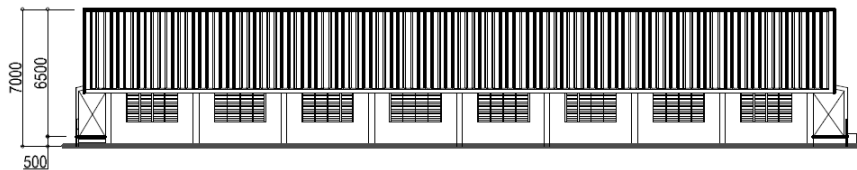
Figure 2-2-1 Outline Design Drawing (Elementary School - 1)

THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	SITE PLANS	Leyte, Palo Arado Elementary School	1
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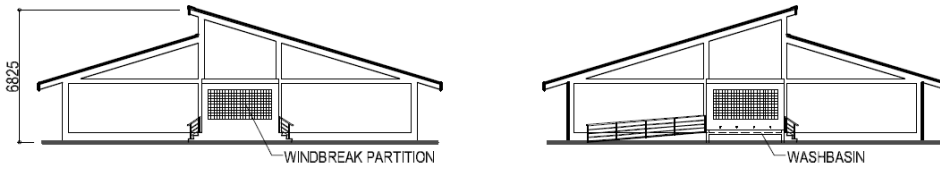
### 8 CLASSROOM BUILDING, ONE STORY



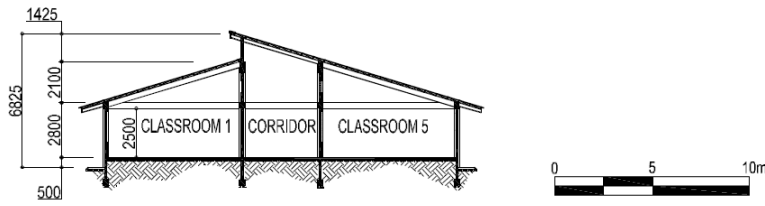
PLAN



FRONT ELEVATION



SIDE ELEVATION

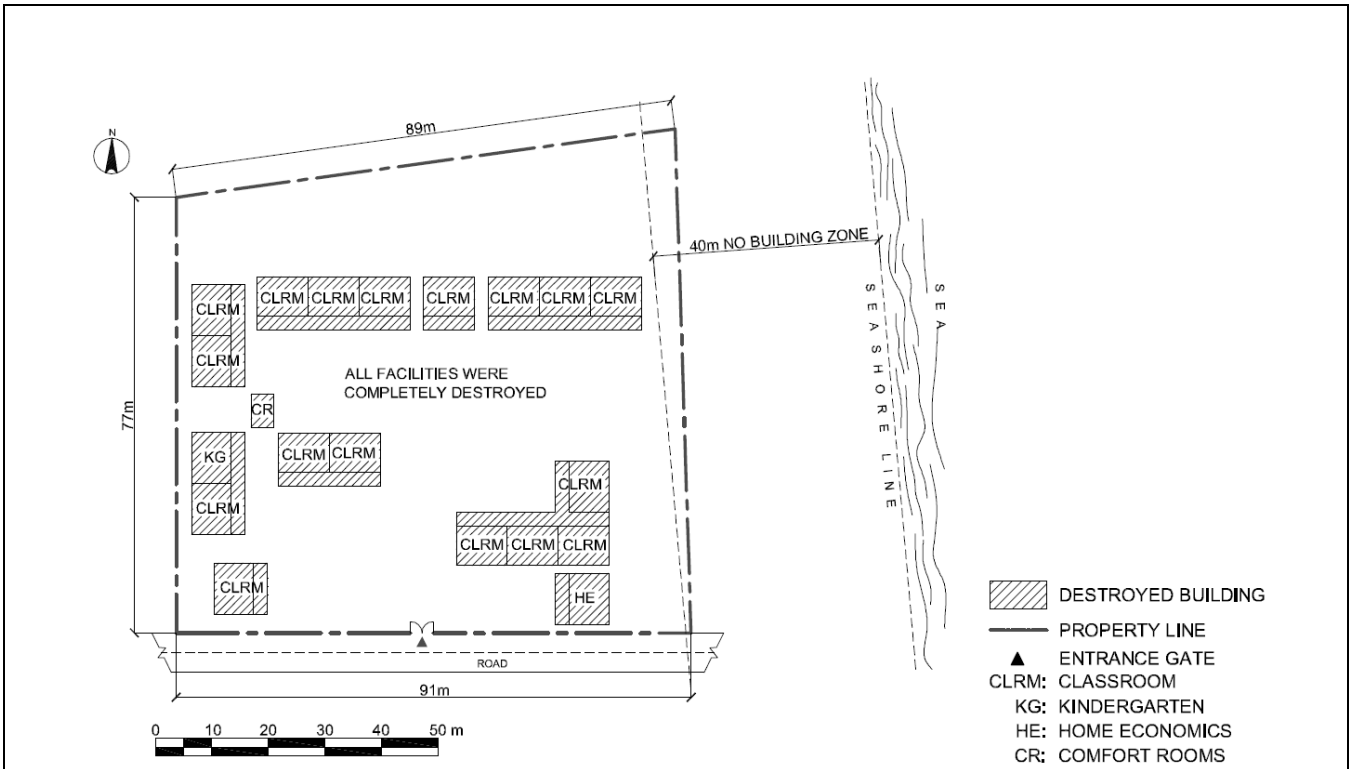


SECTION

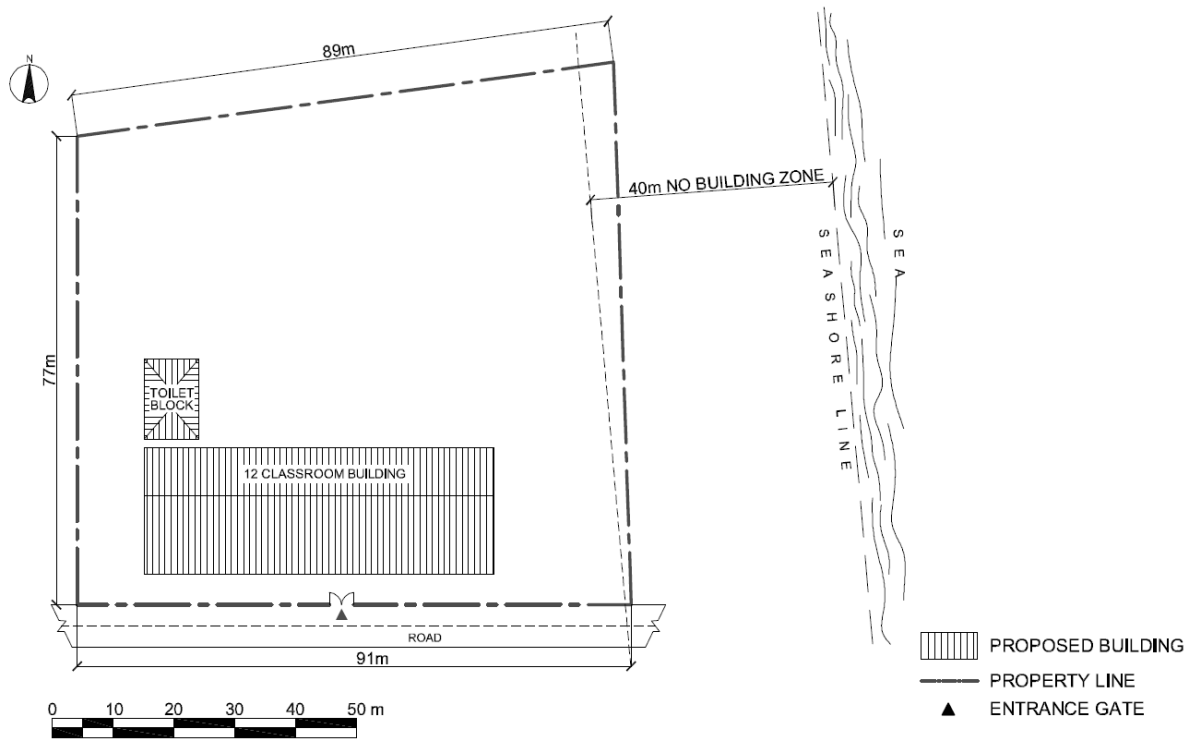
FINISH SCHEDULE		
EXTERIOR	ROOF	GALVALUME IRON SHEET
	WALL	PAIN ON CEMENT PLASTERING, CONCRETE
	DOOR &	STEEL DOOR, WOODEN DOOR, ALUMINUM
INTERIOR	FLOOR	TILE
	WALL	PAIN ON CEMENT PLASTERING
	CEILING	PLASTER BOARDS

**Figure 2-2-2 Outline Design Drawing (Elementary School - 2)**

THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	BUILDING PLAN, ELEVATION, SECTION	Leyte, Palo Arado Elementary School	2
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EXISTING SITE PLAN

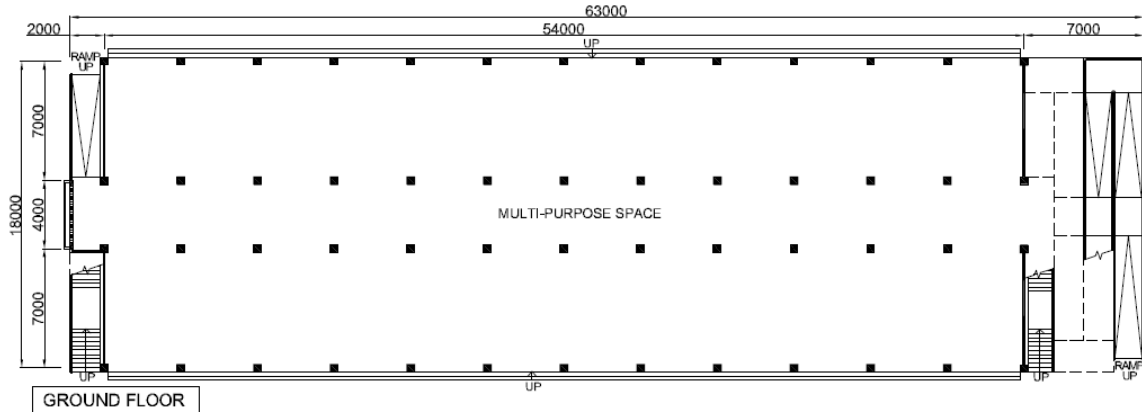
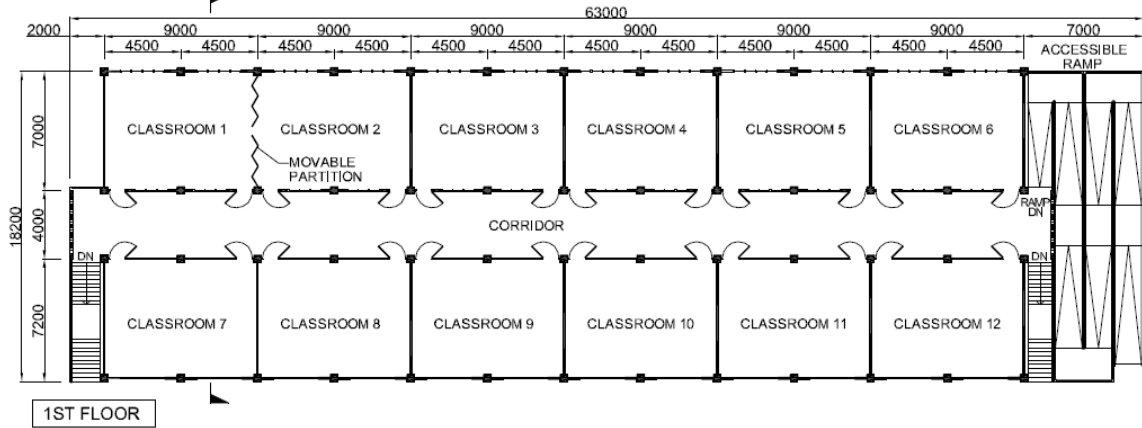


PROPOSED SITE PLAN

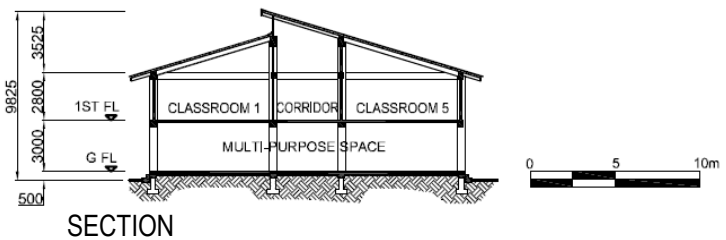
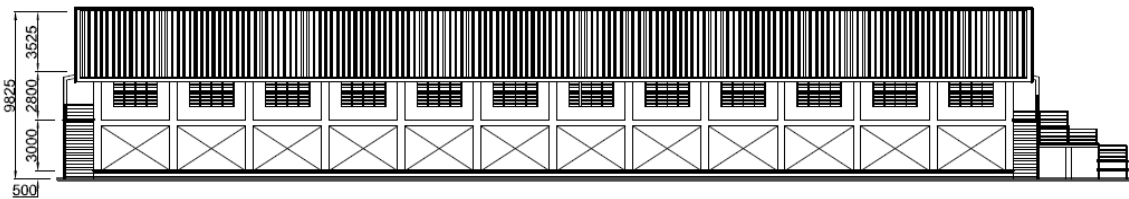
Figure 2-2-3 Outline Design Drawing (Elementary School - 3)

THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	SITE PLANS	Leyte, Tanauan San Roque Elementary School	3
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**12 CLASSROOM BUILDING, TWO STORY (PILOT)**



**PLAN**



FINISH SCHEDULE		
EXTERIOR	ROOF	GALVALUME IRON SHEET
	WALL	PAINT ON CEMENT MORTAR PLASTERING
	DOOR & WINDOW	STEEL DOOR, WOODEN DOOR, ALUMINUM
INTERIOR	MULTIPURPOSE SPACE	INTERLOCKING BLOCK / PEBBLE WASHOUT
	FLOOR	TILE
	WALL	PAINT ON CEMENT MORTAR PLASTERING
	CEILING	PLASTER BOARDS, PAINT ON CONCRETE SLAB

**Figure 2-2-4 Outline Design Drawing (Elementary School - 4)**

THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	BUILDING PLAN, ELEVATION, SECTION	Leyte, Tanauan San Roque Elementary School	4
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## **2-2-1-5 Implementation Plan**

### **(1) Construction and Procurement Plan**

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.

- 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.
- 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.
- With the assistance of the above-mentioned Consultant, the Province will implement a 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**

- 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.
- The Project will give full attention to safety control, quality control, and schedule control, and utilize the skills of the Japanese contractor.
- The security and theft prevention within the construction site for the overall construction work will be sufficiently considered.
- 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.

### 3) Demolition of Existing Buildings and Removal of On-site Obstacles

As a Grant Aid project, since the existing buildings and underground buried objects are obstacles for new facility constructions, they are to be done by Recipient country's side. The table below shows necessary demolition and removal works at each site.

**Table 2-2-6 Description of Removal Work Prior to the Construction (Elementary School)**

No.	School Name	Removal Work
1	Arado ES, Palo	Concrete slab and foundation of six classrooms 420 m <sup>2</sup>
2	St. Niño ES, Tanuan	Concrete slab and foundation of six classrooms 420 m <sup>2</sup>
3	San Roque ES, Tanuan	Concrete slab and foundation of eight classrooms 560 m <sup>2</sup>
4	Tolosa CES (DZRMS)	Concrete slab and foundation of three classrooms 210 m <sup>2</sup>
5	Dulag South CES	Concrete slab and foundation of six classrooms 420 m <sup>2</sup>
6	Macarthur CES	Concrete slab and foundation of three classrooms 210 m <sup>2</sup>
7	Osmeña ES, Marabut	N/A
8	Giporlos CES	Concrete slab and foundation of six classrooms 420 m <sup>2</sup>

### (2) Points to Be Regarded for Construction and Procurement

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.

- 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.
- 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.
- 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 warrants should be assured in accordance with the construction plan.

### (3) Demarcation of Construction and Procurement

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

- Construction of the facilities in the Project (8 school sites)
- Dismantling and clearing obstacles at the construction sites (including underground obstacles)

## **2) Construction and Procurement to Be Undertaken by the Philippine Side**

- Acquisition of the construction sites
- Arrangement for a storage yard for construction material
- Application for and supply of temporary electricity
- Installation of permanent electricity and city water connections
- Bearing value add tax

## **(4) Construction Supervision Plan**

### **1) Preparation of Tender Documentation**

Since the tender documentation needs to be prepared in a short time as a fast track project, all preparation works, excluding two trips to Philippines for DD survey and Explanation of Tender Documents to the Philippine side, shall be carried out in Japan as a general rule.

### **2) Tender Evaluation**

Since the Grant Aid Project is to be awarded to a Japanese Construction Company, the pre-tender meeting shall be carried out in Japan as a matter of convenience. As a representative of the tender hosting side, the person in charge for the project from the Philippine side shall come to Japan, attend the tender opening, and sign construction contracts.

### **3) Construction supervision plan**

The supervision of the Project will be put into practice using a two-fold system of general supervision and resident supervision.

#### **a) 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.

#### **b) Supervision in the Philippines**

A Japanese architect with relevant supervising experience will be stationed in the Province and work with 3 local engineers 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 Philippine side.

The resident supervision office will be set up in Tacloban 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.

## (5) Quality Control

In compliance with the supervision plan and the drawings and specifications, an examination of the execution 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 below.

**Table 2-2-7 Principal Quality Control Items During Structural Work Stage (Elementary School)**

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 DPWH regional office or private laboratory (Quantum Testing Laboratory). However, testing equipment of DPWH has been damaged by the typhoon and temporarily cannot be used. 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 laboratory for a compression test.

## (6) Procurement of Machinery and Materials

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 Tacloban city, there is no concern about procurement. In case particular items are out of stock,

they could easily be procured by land from Metropolitan Manila or Cebu city. 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 below.

**Table 2-2-8 List of Material to be Locally Procured (Elementary School)**

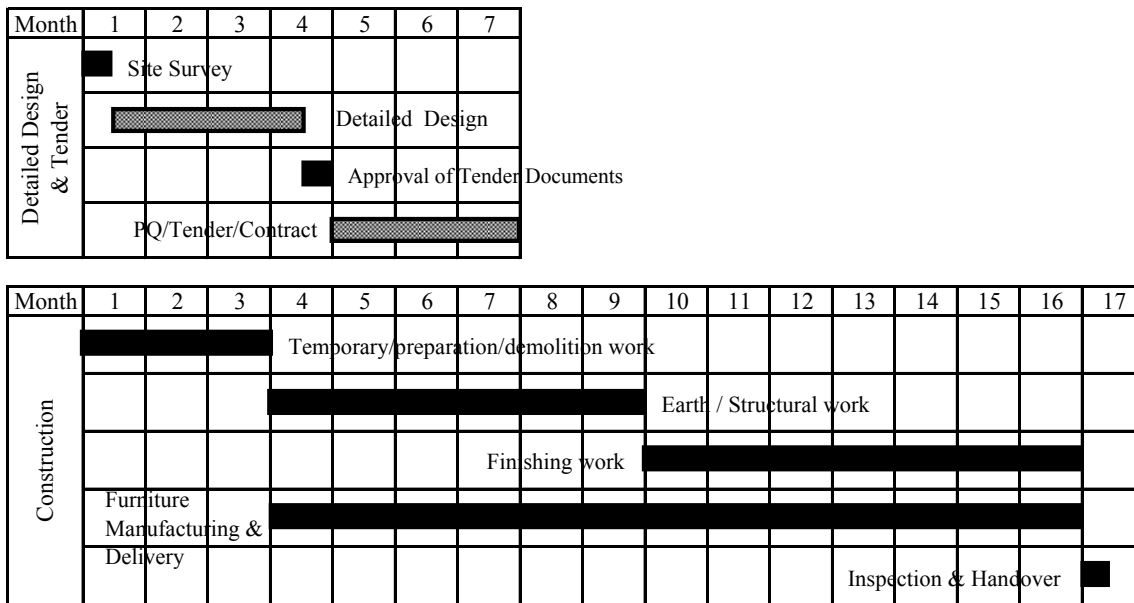
Items	Domestic	Import	Original country
<b>Architectural material</b>			
Portland cement	○		
Plaster	○		
Concrete aggregate	○		
Deformed steel bar	○		
Steel	○		
Form material	○		
Concrete block	○		
Galvalume steel plate for roof	○		
Ceramic tile	○	○	China
Wood	○		
Steel door and window	○		
Aluminum door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

### (7) Execution Schedule

As the result of the aforesaid analyses, the execution schedule of the Project is set as shown in the figure below.

- From the consultant agreement to the construction contract : 7.0 months
- From the construction contract to the hand-over : 16.5 months

(Including demolition of existing concrete slabs, foundation and etc.)



**Figure 2-2-5 Project Implementation Schedule (Elementary School)**

## 2-2-2 Reconstruction of Medical Facilities

### 2-2-2-1 Design Policy

#### (1) Design Policy

##### 1) Design Policy for Facilities

Facility plans for the Regional Health & Medical Facility listed on Table-1, shall be designed based on the following principles. The site investigation and planning of the facilities is collaborated with the relevant authorities.

Policy-1: The following codes, standards, guidelines and manuals are principally used in establishing design conditions of structures:

- General Regulation: National Building Code of the Philippines (NBCP)
- Fire Code of the Philippines (FCP)
- Structural Regulation: National Structural Code of the Philippines
- Supplementary applicable Japanese practices for building safe structures

Policy-2: The construction method and materials to be utilized shall be appropriate to the model plan for future development by the Philippines Government themselves.

Policy-3: The new type of the RHU shall be designed to be protected against disaster, seismic load, and wind load for the emergency evacuation. Therefore, generators shall be installed.

Policy-4: The new RHU shall be designed in appropriate scale for future modification. The common space will be utilized for a multi-purpose space or First-Aid station.

**Policy-5:** In case of RHU built near the seashore, a Piloti system building (free ground floor = not allocating major functional room) shall be constructed to reduce high tide flood damage and to save the neighboring people. In a normal situation, the ground floor Piloti space can offer a large shaded rain free multifunctional space good for a gathering and other community activities as well.

**Table 2-2-9 Weather Condition in Leyte and Samar Islands (Medical Facility)**

Location & Name of Facility				Building Type / Scale	Target Size	
EVRMC (Eastern Visaya Regional Medical Center)						
1	Leyte	Tacloban	Outpatient Quarters in EVRMC (Relocation site)	RC, 3 stories	4,500	sqm
RHU						
1	Leyte	Dulag	Rural Health Unit	RC, 2 stories	680	sqm
2	Leyte	Abuyog	Abuyog II, Rural Health Unit	RC, Single story	680	sqm
3	W. Samar	Marabut	Rural Health Unit	RC, 2 stories (piloti)	680	sqm
4	E. Samar	Lawaan	Rural Health Unit	RC, 2 stories	680	sqm

## 2) Design Policy for Equipment Procurement

In conceiving the equipment plan, the following points are taken into consideration, in order to secure the sustainability of the facility.

- To plan essential items for the function of the target facility,
- To plan items, numbers and specifications to meet the building plan,
- To select the items which RHU can manage to operate and maintain properly with present numbers of medical staff members, the technical level and budget, and
- To enable the facility to provide basic services even in disaster time.

## (2) Policy on Utilization of Local Company

### 1) Facility Plan

The knowledge or information for unit construction price or labor circumstance will be obtained through local construction company of which DPWH shows a technology level, personnel and organization power.

### 2) Equipment Plan

As local equipment agents exist in this country it is assumed that engineers of the agents will undertake equipment installation, and operation training for equipment work.

### **(3) Policy on Operation and Maintenance Ability of Implementation Organization**

#### **1) Facility Plan**

The local construction methods, building-regulations and labor circumstances will be reported through DPWH. Necessary information for proceeding the plan of the project will be obtained from RHU or DOH.

#### **2) Equipment Plan**

RHU requests repair works to the technicians of each municipality that has jurisdiction over the facilities, when RHU personnel can't deal with equipment troubles. When they still cannot repair it properly, they bring the machine with them to ask an engineer of the DOH Region 8 office for repair. For example, a laboratory technician of RHU Abuyog brought a microscope with her to the DOH office, and the engineer in charge of medical equipment fixed the microscope. DOH plans to train the electrical engineer further on medical equipment for preventive maintenance and trouble shooting.

### **(4) Policy on Project Schedule**

#### **1) Facility and Equipment Plan**

The operation and maintenance expense of equipment concerned for the target facilities for this project is going to be provided with a budget issued by the municipality the same as before. In this project, the facility scale remains the same in comparison with those of existing facilities and most items of the equipment plan will be procured for replacement of the existing equipment damaged by the disaster. Therefore, the maintenance expenses will not increase so much compared to that of the present expenses. For the functions and grades of the equipment, they should meet the services provided in the target facilities. For the specifications, it is planned that the mechanism of the equipment be as simple as possible and be durable to minimize the maintenance cost. Furthermore, priority is given to models prevailing in the facilities concerned in the light of ease of maintenance and the equipment operation.

### **2-2-2-2 Basic Plan**

#### **1) Facility Plan**

Among the damages caused by Typhoon Yolanda, most of the damages were caused by the strong winds, such as lost/damaged roofs, and others were collapse of the building by the power of the storm surge in lower-lands.

The reason why roofs were lost/damaged mostly is the thickness of the roof material, connection with the roof truss and insufficient bearing force of the wooden roof trusses. Based on the

experience and on the policy of BBB, a model for public facilities shall be instituted with protection against upcoming disasters. While, a type of piloti system in which the 2nd floor is elevated is protective against storm tide and will preserve lives and prevent collapse of facilities.

## **2) Equipment Plan**

As a component of this project, operation and daily maintenance training is planned in the hand-over of the equipment for medical personnel of RHU, and technical persons of the municipality and DOH Region 8, to realize smoother maintenance for the equipment. Those concerned in DOH Region 8 and of the target facilities should have their equipment operation and service manuals prior to the implementation.

### **2-2-2-3 Whole Plan**

#### **(1) Facilities**

The primary function is delivery, health-care and tuberculosis consultation. The new concept of three functions in one facility and provision of medical equipment is a result of the project. The floor area is scheduled around 670 m<sup>2</sup> to 700 m<sup>2</sup> and the ground Floor will be elevated 60cm from the ground level. The entrance for tuberculosis patients will be separately located from the main entrance to avoid infection. The facilities can be one of three types, single story, two stories and piloti system based on site condition.

#### **(2) Equipment**

##### **1) Disposition**

The equipment plan covers the items which will be installed in new facilities of RHUs.

##### **2) Infrastructure Required to Install the Equipment**

- Power supply: they say that this region has frequent power failures and also voltage fluctuations of around 20% and thus AVS will be attached to power sensitive items such as a chemistry analyzer.
- Water quality: water treatment is required as the water contains minerals that affect some items such as autoclaves. In this plan, a distiller will be attached to the autoclave.
- Local agents: For the items which require regular supply of consumables and spare parts, and maintenance service, it is necessary for a supplier to appoint local agents to offer such items as a condition of tendering.

### **3) Purpose of Use**

The equipment plan is aiming at procurement of essential items for RHUs to provide primary health service.

### **4) Disposition of the Equipment**

The equipment will be installed in a consultation room, a treatment room, a prenatal examination room, a laboratory, a labor room, a delivery room, recovery room, a dental room in RHU.

### **5) Consideration of Equipment Plan**

The selection criteria for the equipment planning are described hereunder for this project.

- To limit the equipment within the range for which sustainability can be secured considering the present manpower disposition and operation and maintenance plan,
- To prioritize the items which DOH cannot afford to procure as it is beyond the range of self-efforts,
- To prioritize the items which are needed for provision of basic and essential medical services, and
- To prioritize the items which contribute to continuing of the essential services even in disaster time.

The equipment which meets all the above-mentioned criteria will be selected and the examination result is compiled into the following table.

**Table 2-2-10 Examination Result for Medical Equipment**

No.	Depts..	Item Description	RHU Lawaan				RHU Marabut			RHU Dulag		RHU Abuyog		Examin. Result
			Rqrd nos.	Plnd nos.	W nos.	DOH assistance	Plnd nos.	W nos.	DOH assistance	Plnd nos.	W nos.	Plnd nos.	W nos.	
001	Consultation room	Weighing machine-adult	1	1	0	0	0	1	1	0	3	0	1	×
002		Weighing machine-paed	1	1	0	0	1	0	0	0	1	1	0	×
003		Weighing machine-neonate	1	1	0	0	0	0	1	0	1	1	0	×
004		Blood pressure meter	3	3	0	0	2	1	0	2	1	2	1	×
005		Stethoscope	1	0	2	0	0	4	0	0	1	0	1	×
006		Patient stool	1	0	2	0	0	50	0	0	12	1	0	×
007		Examination light	1	1	0	0	1	0	1	0	1	1	0	×
008		Instruments set for consultation	1	1	0	0	1	0	0	0	1	1	0	×
009		Examination table	1	1	0	0	1	0	0	0	1	1	0	×
010	Treatment/ Injection room	Instruments cabinet	1	1	0	0	0	0	1	0	1	1	0	×
011		Examination light	1	1	0	0	1	0	0	1	0	1	0	×
012		Minor surgery set	3	3	0	0	1	0	2	3	0	3	0	×
013	Prenatal examination room	Examination table-ObGy	2	2	0	0	0	1	1	0	5	2	0	×
014		Examination light	2	2	0	0	2	0	0	2	0	2	0	×
015		Examination set	3	3	0	0	2	1	0	2	1	2	1	×
016		Hysterometer	1	1	0	0	1	0	0	1	0	1	0	×
017	Laboratory	Hemoglobinmeter	1	0	1	0	1	0	0	0	1	1	0	×
018		Microscope	1	0	1	1	1	0	0	0	2	0	1	×
019		Clinical Centrifuge	1	0	0	1	1	0	0	0	1	0	1	○
020		Hematocrit Centrifuge	1	1	0	0	1	0	0	0	1	0	1	○
021		Chemistry analyzer	1	0	0	1	1	0	0	1	0	0	1	○
022		Differential blood counter	1	0	0	1	1	0	0	1	0	0	1	×
023		Hemacytometer	1	1	0	0	1	0	0	1	0	1	0	×
024		Dry oven	1	1	0	0	1	0	0	1	0	1	0	×
025		Water bath	1	1	0	0	1	0	0	1	0	0	1	○
026		Refrigerator	1	1	0	0	1	0	0	0	1	0	1	○
027	TB laboratory	Safety cabinet	1	1	0	0	1	0	0	1	0	1	0	○
028	Binocular Microscope	1	0	0	1	0	0	1	0	0	0	0	×	
029	Labor room	Fetal Doppler detector	2	2	0	0	2	0	0	1	1	2	0	○
030		Labor beds	3	3	0	0	3	0	0	2	1	1	2	○
031	Delivery room	Delivery table	2	2	0	0	1	1	0	1	1	1	1	○
032		Operating light stand	2	2	0	0	2	0	0	2	0	2	0	○
033		Suction machine (2L)	2	2	0	0	2	0	0	1	1	2	0	×
034		Bassinet	2	2	0	0	2	0	0	0	2	2	0	×
035		Resuscitator-adult	2	2	0	0	2	0	0	1	1	2	0	×
036		Resuscitator-paed	2	2	0	0	2	0	0	1	1	2	0	×
037		Delivery instruments set	3	3	0	0	1	2	0	0	6	2	1	×
038		Oxygen inhalation set	3	1	2	0	3	0	0	0	3	3	0	×
039		Oxygen cylinder (50L) w/ regulator	2	0	2	0	2	0	0	0	2	1	1	×
040		Autoclave	1	1	0	0	1	0	0	0	2	1	0	○
041		Instruments cart	2	2	0	0	1	0	1	1	1	1	1	×
042		Refrigerator	1	0	1	0	1	0	0	1	0	0	1	○
043		Mucous extractor (Suction pump)	3	3	0	0	3	0	0	2	1	2	1	×
044		Recovery room	Recovery bed	3	3	0	0	3	0	0	0	5	3	0
045	Nebulizer		2	1	1	0	2	0	0	1	1	2	0	○
046	Irrigator stand		5	4	1	0	4	1	0	4	1	4	1	×
047	Dental room	Dental treatment unit	1	0	1	1	1	0	0	0	1	1	0	○
048		Autoclave	1	1	0	0	1	0	0	1	0	1	0	○
049		Dental forceps set	3	2	1	0	3	0	0	2	1	3	0	○
050		Light cure	1	1	0	0	1	0	0	0	1	1	0	○
051	Ultrasonic scaler	1	1	0	0	1	0	0	1	0	1	0	○	
052	Back-up	Solar power system	1	1	0	0	1	0	0	0	1	1	0	○
053		Generator (5kW)	1	1	0	0	1	0	0	1	0	0	1	×
054	Transportation	Ambulance	1	1	0	0	1	0	0	1	0	1	0	○

The draft equipment plan and specifications summary and use of major items are as follows.



**Table 2-2-11 Draft List of Medical Equipment**

No.	Depts.	Description	RHU Lawaan	RHU Marabut	RHU Dulag	RHU Abuyog
001	Laboratory	Centrifuge	0	1	0	0
002		Hematocrit centrifuge	1	1	0	0
003		Chemistry analyzer	0	1	1	0
004		Water bath	1	1	1	0
005		Refrigerator	1	1	0	0
006	TB Laboratory	Safety cabinet	1	1	1	1
007		Fetal Doppler detector	2	2	1	2
008	Labor room	Labor beds	2	2	1	0
009		Delivery table	2	1	1	1
010	Delivery room	Operating light stand	2	2	2	2
011		Autoclave	1	1	0	1
012		Refrigerator	0	1	1	0
013	Recovery room	Recovery beds	2	2	0	2
014		Nebulizer	1	1	1	2
015	Dental room	Dental treatment unit	0	1	0	1
016		Autoclave	1	1	1	1
017		Dental forceps set	2	3	2	3
018		Light cure	1	1	0	1
019		Ultrasonic scaler	1	1	1	1
020	Back-up	Solar power system	1	1	0	1
021	Transportation	Ambulance	1	1	1	1

**Table 2-2-12 Major Items Specifications and Use (Medical Facility)**

No.	Description	Q'ty	Specifications	Use
003	Chemistry analyzer	2	Capability: Colorimetry 60tests/hr. Colorimetric/electrolysis 77tests/hr. measurement parameters: 30, Sample kinds: whole blood, plasma, serum, urine, sample amount: colorimetry: 10 $\mu$ L/parameter, Electrolysis: Approx. 50 $\mu$ L/parameter	Biochemistry testing
015	Dental treatment unit	2	Treatment chair: electrohydraulic, Back seat: adjustable examination light: 13,000lux, w/ air compressor-oil free	Dental prophylaxis and treatment
020	Solar power system	3	Composition: solar panel, charge controller, battery cell, inverter, fixing material, (1) Solar panel Power consumption: 100W, Max current: 4.80A, (2)Charge controller System voltage:12V, applicable battery cell: sealed and non-sealed (3)battery cell Voltage: 12V, capacity: 100Ah/10hrs, Type: maintenance free, deep cycle, sealed type, expected life > 5yrs. (4) Inverter Type: Sine wave, Input Voltage: DC12V, continuous power:125W	Power source and back-up for the Refrigerator (Vaccine/drugs)and lighting for night delivery
021	Ambulance	4	Vehicle: One box type, high roof, 2WD Engine capacity : approx. 2000 CC, Provided with Stretcher, Beacon Lamp, and Oxygen tank	Transportation of emergency cases to provincial hospitals

The items which need preparation during construction works and the contents of the works are shown in Table 2-2-13. For such works the consultants coordinate between a contractor and an equipment supplier and provide instructions if necessary. In addition, the transference of the existing equipment such as a dental chair is expected in this plan and the consultant will plan smooth enforcement while discussing it with RHUs for the process, and a method for the transference.

**Table 2-2-13 Connection Work and Equipment in RHU (Medical Facility)**

Depts.	Equipment	Works
Delivery room	Autoclaves	Plumbing work for water supply and drainage
Dental room	Dental treatment unit	Fixing a conduit and sealing work for a compressor piping
	Autoclaves	Plumbing work for water supply and drainage
Service facility	Solar power system	Laying of conduits to lay power cables to a delivery room and a laboratory

#### **2-2-2-4 Facility Plan**

##### **(1) Architectural Design**

###### **1) Roof Design**

To secure a more resilient roof against strong wind pressure, JICA buildings adopt the following methods.

###### **a) Concrete Ridge Frame**

To prevent the damage to the steel truss, we introduce concrete ridge frame into JICA buildings.

###### **b) Roof Material**

We apply 0.6 mm thick galvalume (aluminum and zinc - plated) steel sheets taking the advantage of durability and weather-proofing into consideration.

###### **2) Plan**

The facility has three functions in one facility type as follows:

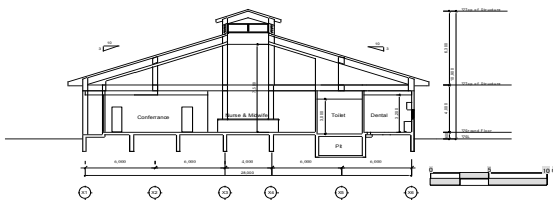
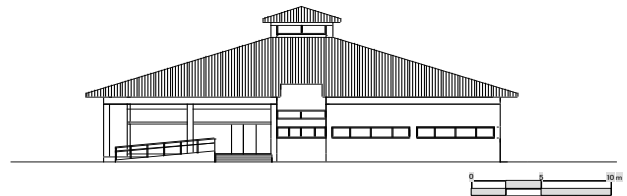
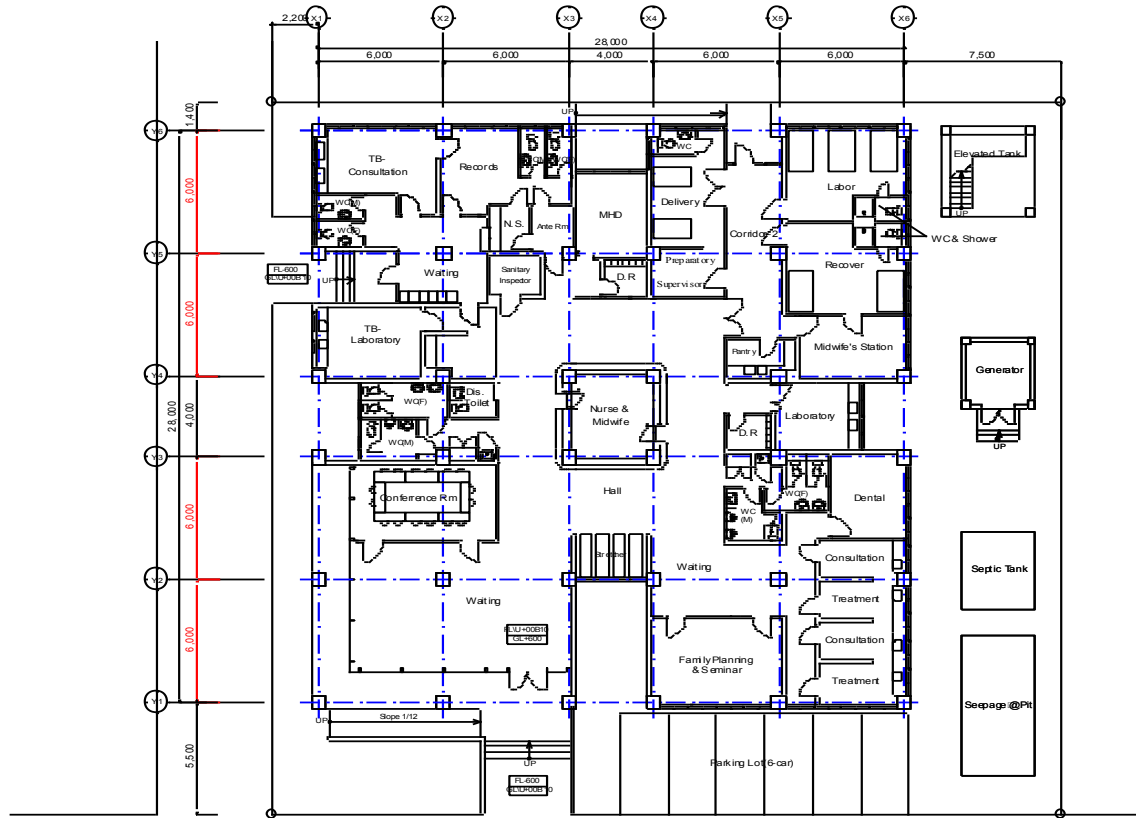
- Obstetrics ; labor, delivery, recovery, preparatory, midwife' station, supervisor, pantry, m.h.o.
- Health-care: consultation rooms, reception, nurse's station, waiting, treatment, sanitary inspector, laboratory
- Tuberculosis: reception, waiting, TB-consultation, TB-laboratory, ante room, wc

###### **3) Structural Design**

Structural design and calculations shall be adapted based on Philippine standards as well as Japanese standards for of enhancement of the structure and sustainability for the emergency evacuation in a disaster.

#### **2-2-2-5 Outline Design Drawing**

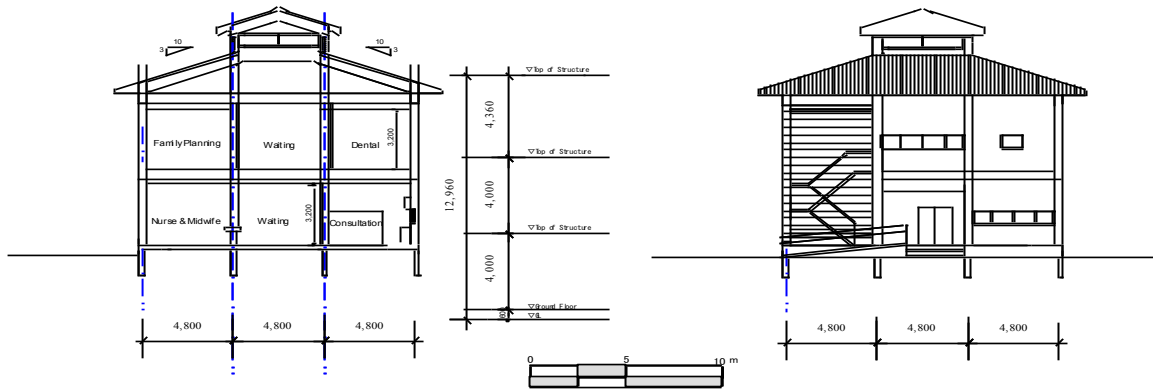
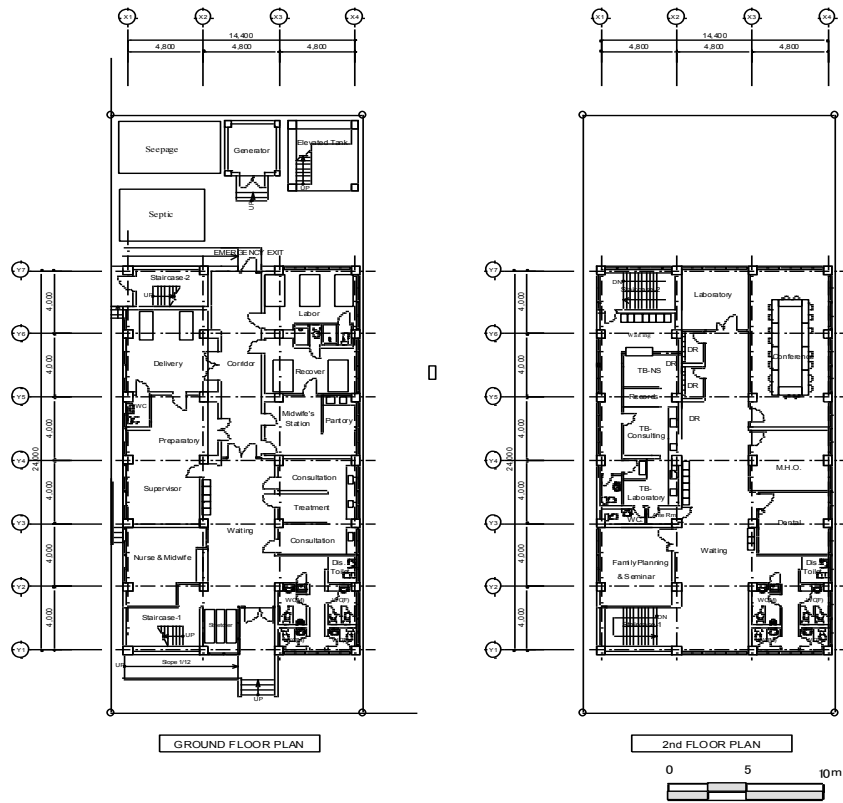
The outline design drawing is given in below.



FINISH SCHEDULE		
EXTERIOR	ROOF	Galvalume Steel Sheet
	WALL	Mortar steel trowel
	DOOR & WINDOW	Steel Door, Wooden Door, Aluminum sash
INTERIOR	FLOOR	Tile (non-slip)
	WALL	Mortarsteel trowel ,AEP
	CEILING	T-Suspension ceiling,

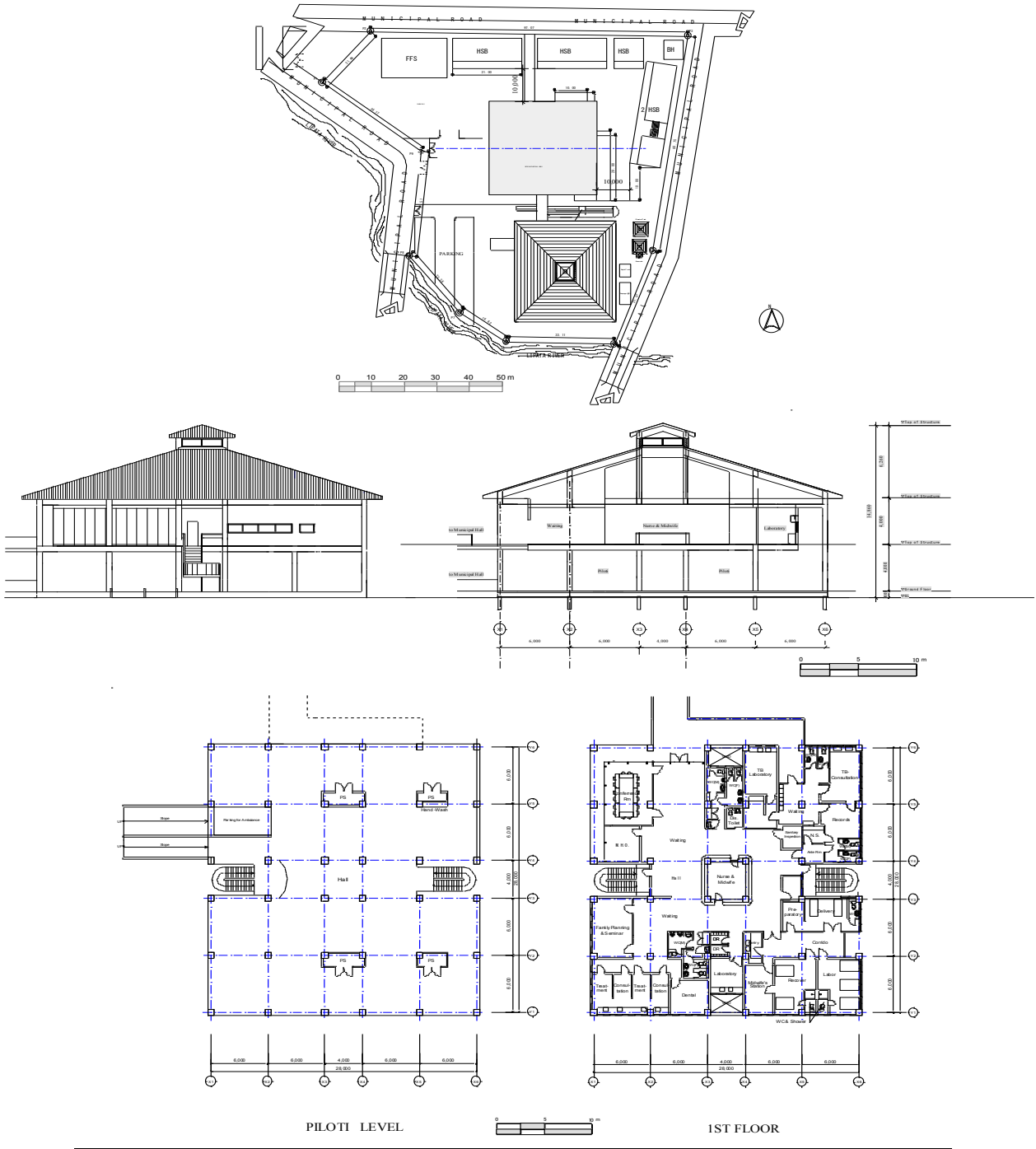
**Figure 2-2-6 Outline Design Drawing (Medical Facility - 1)**

THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	BUILDING PLAN, ELEVATION, SECTION	ABUYOG RHU-2	1
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H SCHEDULE		
EXTERIOR	ROOF	Galvalume Steel Sheet
	WALL	Mortar steel trowel
	DOOR & WINDOW	Steel Door, Wooden Door, Aluminum sash
INTERIOR	FLOOR	Tile (non-slip)
	WALL	Mortarsteel trowel ,AEP
	CEILING	T-Suspension ceiling

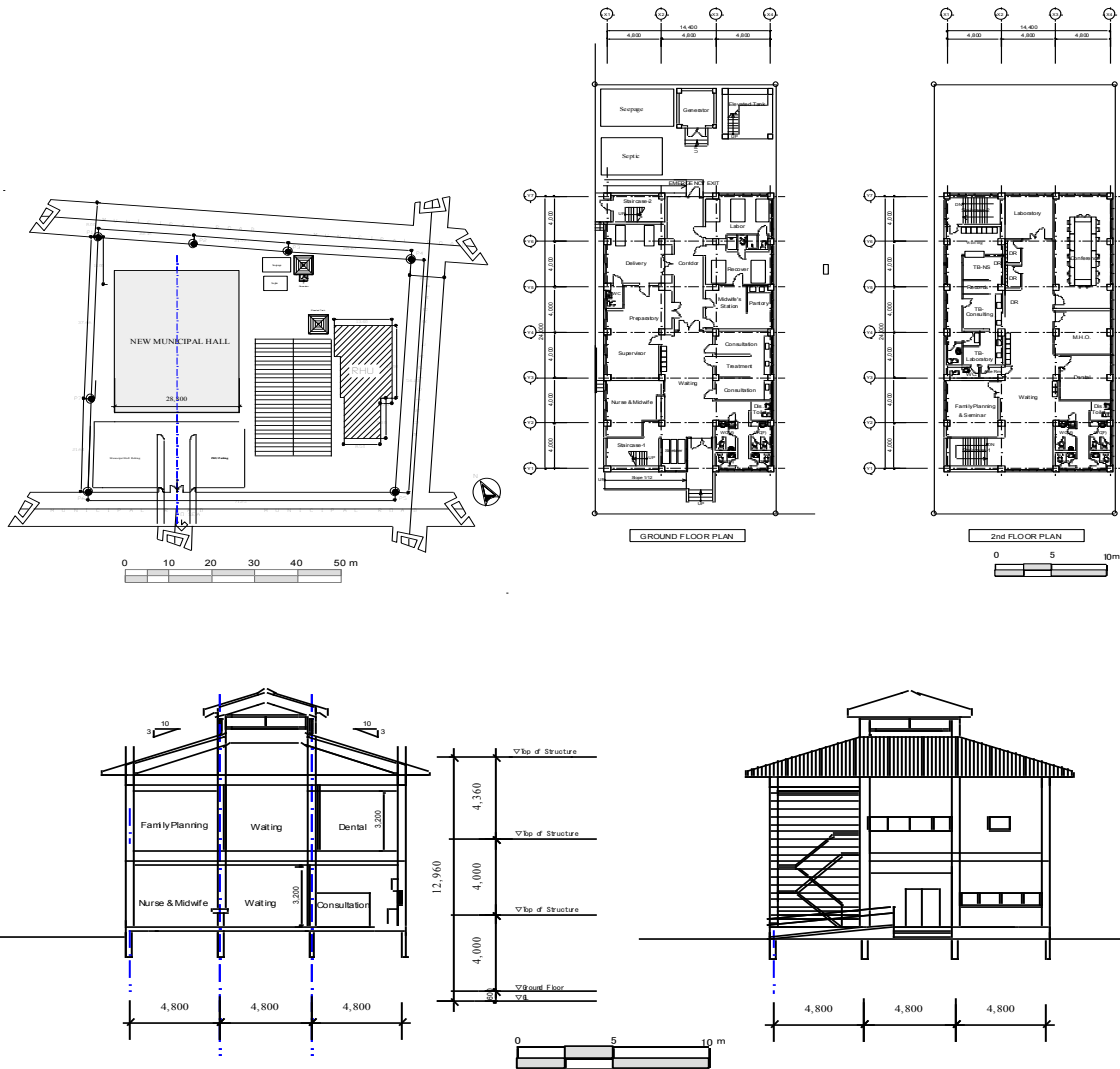
**Figure 2-2-7 Outline Design Drawing (Medical Facility - 2)**



H SCHEDULE		
EXTERIOR	ROOF	Galvalume Steel Sheet
	WALL	Mortar steel trowel
	DOOR & WINDOW	Steel Door, Wooden Door, Aluminum sash
INTERIOR	CEILING	patching mortar
	FLOOR	Tile (non-slip)
	WALL	Mortarsteel trowel ,AEP
	CEILING	T-Suspension ceiling, Paint on concrete slab ceiling

**Figure 2-2-8 Outline Design Drawing (Medical Facility - 3)**

THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	SITE PLAN PLANS	MARABUT RHU	3
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FINISH SCHEDULE		
EXTERIOR	ROOF	Galvalume Steel Sheet
	WALL	Paint on cement mortar plastering
	DOOR & WINDOW	Steel Door, Wooden Door, Aluminum sash
INTERIOR	FLOOR	Tile
	WALL	Paint on cement mortar plastering
	CEILING	T-Suspension ceiling + plaster boards

**Figure 2-2-9 Outline Design Drawing (Medical Facility - 4)**

THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	SITE PLAN, PLANS, ELEVATION, SECTION	LAWAAN RHU	4
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## **2-2-2-6 Implementation Plan**

### **(1) Construction and Procurement Plan**

#### **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.

In principal, the Japanese commitment for the Project will be funded by the taxes collected from the Japanese people, and implemented under the budgetary system of Japan.

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.

With the assistance of the above-mentioned Consultant, the Province will implement a general tender with prequalification, select a Japanese contractor, and make a lump-sum contract for the construction of the Project. Design term is expected to run for 4 months.

#### **2) Policies for Construction Planning**

- 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.
- The Project will give full attention to safety control, quality control, and schedule control, and utilize the skills of the Japanese contractor.
- The security and theft prevention within the construction site for the overall construction work will be sufficiently considered.
- 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.

#### **3) Demolition of Existing Buildings and Removal of On-site Obstacles**

In the JICA Guideline, demolition work shall be done by the recipient country.

## **(2) Points to Be Regarded for Construction and Procurement**

### **1) Natural Condition**

It is rainy season from October to February at the north part of Leyte and south part of Samar, average monthly rainfall is 200 mm in that time, the earth work is difficult to be scheduled.

### **2) Environmental and Social Consideration**

Simple labor shall be employed in the neighborhood for the construction period. The prime construction company shall instruct and confirm this in the contract document.

### **3) Transportation Plan**

Almost all of the construction materials are transported from Cebu Island or Manila. Enough time for transportation shall be allotted in the plan. Some materials are imported from overseas.

## **(3) Demarcation of Construction and Procurement**

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**

- Construction of the facilities in the Project (4 RHU and EVRMC)
- Dismantling and clearing obstacles at the construction sites (including underground obstacles)

### **2) Construction and Procurement to be Undertaken by the Philippine Side**

- Acquisition of the construction sites
- Arrangement for a storage yard for construction material
- Application for and supply of temporary electricity
- Installation of permanent electricity and city water connections
- Construction Permission and any permission concerned
- Bearing for VAT

## **(4) Construction Supervision Plan**

### **1) Detailed Design**

The detailed design will proceed based on a schematic design considering construction circumstances in the Philippines and maintenance cost and local details. The Specifications will be



adapted for Philippine standards, and JIS or JASS of Japanese standards will be conformed to in order to maintain high-quality.

## 2) Preparation of Tender Documentation

The tendering procedure will be conducted by JICA Guidelines for Grant Aid. There are two types of bidding, one is a bidding by a consortium with a construction company and trading company, another type is two separate bidding for construction works and procurement for equipment.

## 3) Construction Supervision

The construction sites of four RHU and EVRMC are widely spread. The work shall be completed on scheduled time. Therefore close communication between the consultants and DOH and the Municipality is important. The Consultants have to timely submit supervisory reports to DOH and the Municipality.

## 4) Procurement Plan

Almost all of the construction material will be procured in the Philippines, but medical equipment shall be imported from Japan or neighbor countries. Therefore supervision for facility construction and installation of medical equipment is to be timely and carefully conducted. The procurement and transportation plan shall be thoroughly considered.

## (5) Quality Control

In compliance with the supervision plan and the drawings and specifications, an examination of the execution 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 the following table.

**Table 2-2-14 Principal Quality Control Items During Structural Work Stage  
(Medical Facility)**

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)	Per plant

Construction type	Items	Inspection method	Frequency
		competence, etc.)	
	Concrete block	Compression test	Per plant
Steel work	Steel material	Product quality check	At the completion of steel framing

## (6) Procurement of Machinery and Materials

### 1) Procurement of Major Machinery

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 Tacloban city, there is no concern about procurement. In case particular items are out of stock, they could easily be procured by land from Metropolitan Manila or Cebu city. 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 the Table below.

**Table 2-2-15 List of Material to be Locally Procured (Medical Facility)**

Items	Domestic	Import	Original country
<b>Architectural material</b>			
Portland cement	○		
Plaster	○		
Concrete aggregate	○		
Deformed steel bar	○		
Steel	○		
Form material	○		
Concrete block	○		
Galvalume steel plate for roofing	○		
Ceramic tile	○	○	China
Wood	○		
Steel door and window	○		
Aluminum door and window	○		
Glass material	○		
Paint and coating material	○	○	China
<b>Material for electrical work</b>			
Electrical Panel	○	○	China, South Korea
Cable and wire	○	○	China
Lighting fixture	○	○	China
Communication device	○		
<b>Material for plumbing work</b>			
Galvanized steel pipe	○		
Valve	○		
PVC pipe	○		
Sanitary ware	○	○	China

### 2) Construction Equipment

#### a) Facilities

Special machines are not needed for the construction of the Project.

**b) Medical Equipment**

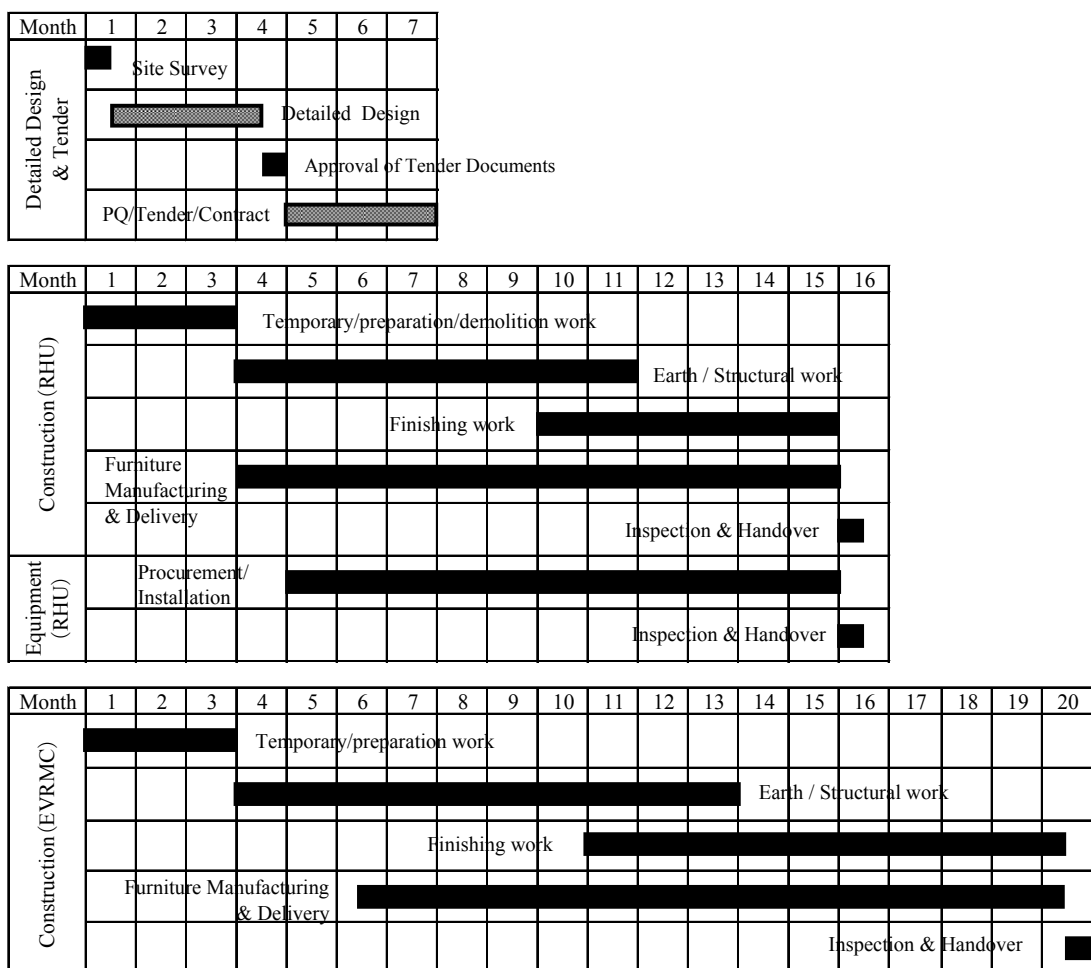
Principally the planned equipment for this project will be procured from Japan, but the third country procurement is considered for the freight costly items such as labor and recovery beds. In addition, it is desirable that items that require spare parts and consumables supply be procured from among manufacturers having appointed agents in the Philippines. For example, a dental treatment unit needs regular maintenance service and spare parts, and a chemistry analyzer requires regularly reagents supply for its operation.

**(7) Implementation Schedule**

As the result of aforesaid analyses, the Implementation schedule of the Project is set as shown in the figure as below.

- From the consultant agreement to the construction contract : 7.0 months
- From the construction contract to the hand-over : 15.5 months (RHU)
- From the construction contract to the hand-over : 20.0 months (EVRMC)

(Including demolition and Removal of existing concrete slabs, foundation and etc.)



**Figure 2-2-10 Project Implementation Schedule (Medical Facility)**

## **2-2-3 Rehabilitation of Electricity Equipment**

### **2-2-3-1 Design Policy**

#### **(1) Design Policy**

Most of the specifications of the existing heavy equipment used for high lift work and pole erection work have integrated both high lift work function and pole erection function designed in the U.S.A. Therefore, if one function has failed and it cannot work due to needing repair, the remaining function cannot be utilized. Also, as the heavy equipment with U.S.A specification has both high lift work function and pole erection function, it is not suitable for the road conditions in the Philippines because of the width of the roads in the Philippines; the equipment's large scale cannot ensure enough mobility in the Philippines. Furthermore, since it has heavy weight, it has low fuel efficiency. Accordingly, the provision of heavy equipment with the high lift work function and the pole erection function separate is appropriate because such heavy equipment, which has been introduced in Japan, can ensure mobility and work capability at the loss of one function. Furthermore, the Japanese vehicle is highly evaluated in terms of fault tolerance. Consequently, the provision of this heavy equipment for high lift work and pole erection is fully helpful.

Based on this design policy, the provision of heavy equipment requested by each EC is determined in consideration of the following current situation.

#### **1) Dorelco**

As for heavy equipment, Dorelco owned one boom truck with bucket and digger, one boom truck with bucket, and a cargo truck. However, the boom truck with bucket and the cargo truck were inundated by storm surge, and they are nearly junk. Dorelco has since procured a new boom truck with bucket and a cargo truck; two pieces of heavy equipment were procured but the cargo truck broke down due to trouble. Therefore, the available heavy equipment for Dorelco is one boom truck with bucket and digger, and two boom trucks with bucket, totaling three pieces of heavy equipment. Two of them have been used for 14 years since purchase. Accordingly, there is the possibility of depletion of spare parts and the potential occurrence of trouble is concerning. Therefore, both boom truck with bucket and winch, and boom truck with digger and crane are to be provided to Dorelco.

#### **2) Leyeco II**

Leyeco II owns five boom trucks with bucket and digger, and one truck with crane for pole carriage—six pieces of heavy equipment in total. Three vehicles, including a cargo truck with boom, are out of order, and available heavy equipment is only three boom trucks with bucket and digger. Two of the available three vehicles were manufactured in 2000 and the other was procured in 1998. Accordingly, depletion of spare parts and potential trouble are concerning. Therefore, both

boom truck with bucket and winch, and boom truck with digger and crane are to be provided to Leyeco II.

### 3) Samelco II

Samelco II owns three pieces of heavy equipment, one boom truck with bucket and digger, one boom truck with bucket, and one cargo truck. The auger of the boom truck with bucket and digger is out of order, and the spare parts are depleted. Therefore, it cannot be repaired into working order. Accordingly, when pole erection is needed, Samleco II has no choice but to manually dig the hole with a post hole digger, and waste much time rebuilding an electric pole. Therefore, both boom truck with bucket and winch, and boom truck with digger and crane are to be provided to Samelco II.

### 4) Esamelco

Esamelco owns one boom truck with bucket (used vehicle purchased in 2008) . Esamelco does not have a boom truck with digger. In order to make up for the shortage of heavy equipment, three pieces of boom truck, namely, one boom truck with digger and bucket, and two boom trucks with bucket, have been lent to Esamelco by other ECs, free of charge. In order to expedite the recovery for heavily damage area, Guiuan, both boom truck with bucket and winch, and boom truck with digger and crane are to be provided to Esamelco.

## (2) Design Policy under Natural Environmental Conditions

The climate in each town located in Leyte Island in the middle of the Philippines and in the south of Samar Island, is tropical rainforest climate in a tropical area. So the temperature fluctuation is slight and it rains much through the year. The temperature and precipitation is as follows:

**Table 2-2-16 Weather Condition in Leyte and Samar Islands (Electricity)**

Item	North-eastern part of Leyte	Southern part of Samar
Monthly average maximum temperature (Maximum month)	31.0°C (May)	30.5°C (August)
Monthly average minimum temperature (Minimum month)	23.0°C (January)	22.8°C (January)
Precipitation (Yearly)	2,293mm	4,120mm
Precipitation (Monthly Maximum)	305.3mm (December)	343.3mm (December)

Source : World Weather Organization

The natural site conditions, which is tropical rainforest climate, for determining the specification of the heavy equipment used outside, especially, the environmental conditions such as high temperature and humidity, heavy rain, strong direct sunlight, and salt injury, should be considered

### **(3) Design Policy under Social and Economic Conditions**

Since the recovery of power supply is essential to accelerate political, economic, and cultural activities in the social infrastructure, the heavy equipment contributing to early recovery of damaged power distribution facilities, is selected as a component of this project.

### **(4) Design Policy under Procurement, Business Practice, and Specific Circumstances**

There is no specific consideration on procured heavy equipment under procurement, business practice and specific circumstances.

### **(5) Design Policy by Utilization of Local Supplier**

The installation of procured heavy equipment through this project is implemented mainly by the manufacturer. It is possible to implement the procurement through the resources of a manufacturer that has branch offices in the Philippines.

### **(6) Structure Policy on Operation and Maintenance**

In the targeted EC, boom trucks with bucket and boom trucks with digger have been maintained by each EC itself. Accordingly, under the same maintenance structure, the heavy equipment procured through this project shall be maintained.

### **(7) Policy on the Setting of Equipment Grade**

The Boom trucks procured through this project have to meet the Filipino standards.

### **(8) Procurement Methodology and Policy on Project Schedule**

The heavy equipment procured through this project is manufactured on the built –to –order basis. In order to urgently assist the recovery and rehabilitation for damaged power distribution facilities in the coastal area around San Pedro and San Pablo gulf, prompt delivery and installation of heavy equipment are required. Accordingly, the manufacturing, installation, commissioning test, adjustment, and initial operation training should be considered as soon and effectively as possible.

## **2-2-3-2 Basic Planning (Equipment Planning)**

### **(1) Total Planning**

#### **1) Kinds and Allocation of Equipment**

Based on the design policy mentioned at the previous chapter and discussion with NEA, the summary, quantity, and allocation of equipment is planned as follows:

**Table 2-2-17 Allocation of Heavy Equipment Provided for Each EC (Electricity)**

EC	1.BTwB	2.BTwD
<b>Dorelco</b>	2	2
<b>Leyeco II</b>	2	2
<b>Samelco II</b>	1	1
<b>Esamelco</b>	2	2

\*BTwB: Boom Truck with Bucket

\*BTwD: Boom Truck with Digger

**(2) Equipment Planning**

**1) Equipment Planning**

The purpose and main specification for procured equipment are as follows:

**Table 2-2-18 List of Equipment Procurement (Electricity)**

Name of Equipment	Qty	Delivery Place Purpose	Main Specifications
1. Boom Truck with Bucket and Winch	7	Dorelco Leyeco II Samelco II Esamelco  High Lift Work and Recovery and Rehabilitation Work for Power Distribution Facilities	Dimensions Length 7,000 mm or below Width 2,300 mm or below Height 4,000 mm or below Bucket Max. Bucket Bottom 14 m Height Max. Bucket Loading 200 kg Capacity Boom Length 4 m – 13 m Lifting Device Max. Capacity 490 kg Wheel Drive Four-Wheel Drive Condition for Drive Movable on general roads in the Philippines Steering Left-Hand Side
2. Boom Truck with Digger and Crane	7	Dorelco Leyeco II Samelco II Esamelco  Pole Erection	Dimensions Length 7,500 mm or below Width 2,200 mm or below Height 3,350 mm or below Lifting Specifications Max. Load Capacity 2.9 t Boom Length 4 m – 13 m Digger Device Drilling Diameter 0.45 m Max. Drilling Depth 5.2 m Torque of Auger 720 kgf·m Wheel Drive Four-Wheel Drive Condition for Drive Movable on general roads in the Philippines Steering Left-Hand Side

**2) Spare Parts Replacement Planning**

Heavy equipment procured in this project is expected to be highly active. If it cannot work properly due to troubles and faults, it leads to the delay of recovery work and significantly affects the recovery schedule for the damaged power distribution network. Therefore, in order to minimize the duration of breakdown of equipment, it is absolutely imperative to prepare spare parts and

consumables beforehand. Accordingly, the spare parts for one year recommended by manufacture are procured in this project. The period guaranteed by manufacture is one year based on the guarantee period for the ordinary grant-assistance project. Within the guarantee period, the manufacturer will supply the spare parts required for the regular operation, and establish the structure which enables equipment to be repaired promptly. After the guarantee period, each EC itself is required to sustain the maintenance structure under which it can surely conduct the maintenance work such as periodical inspection and repair work for newly provided heavy equipment as well as the existing ones.

### 2-2-3-3 Procurement Planning

#### (1) Procurement Policy

The boom truck with bucket and the boom truck with digger, which are provided in this project, are not manufactured in the Philippines. Since the provision of such heavy equipment is intended to be used for emergent recovery work, they will be procured from a Japanese manufacturer that can promptly procure and allocate them. When the procurement is planned, the heavy equipment, which meet the specifications on the bidding documents and can be easily maintained, and the supporting system is established like the spare parts can be quickly provided when the faults occurred, shall be selected. The engineer of the manufacturer is required to implement the installation, adjustment, commissioning test, training for initial operation and maintenance.

#### (2) Consideration on Procurement

Since the boom truck with bucket and the boom truck with digger are intended for prompt recovery as essential equipment and it is required to allocate them to each EC as soon as possible, the procurement schedule shall be designed to be as short as possible so as to efficiently complete each step, namely, manufacturing, installation, commissioning test, training for initial operation and maintenance.

#### (3) Classification of Procurement and Installation

Responsibility range of Japan and the Philippines is as shown in the table below.

**Table 2-2-19 Classification of Procurement and Installation (Electricity)**

Target	Item	Japan Side	The Philippines Side
Common Items	Procedure of Banking Agreement(B/A) and Authorization to Pay(A/P)		○
	Bearing Duty, Customs Charge		○
	Procurement for Equipment	○	
	Packing and Transportation for Equipment	○	
	Installation, adjustment, and commissioning test for equipment	○	
BTwB	Securing Storage Space (Garage)		○
BTwD	Application for Car License for Road-going		○

\*BTwB: Boom Truck with Bucket

\*BTwD: Boom Truck with Digger



#### **(4) Procurement Administration Planning**

According to the implementation procedure of Japanese grant assistance, the consultant shall enter into agreement with an implementation agency in the Filipino government regarding execution of the design and procurement and administration work related to this project, and implement it after obtaining the certification of the Japanese Foreign Ministry.

##### **1) Design Work for Implementation**

The consultant shall implement the design work for implementation shown on the contract documents based on the findings of this grant aid plan, Exchange of Notes (E/N), and Grant Agreement (G/A).

##### **2) Tasks Related to Bidding**

The consultant shall discuss the selection of bidding participants and the method of bidding with the Filipino government execution agency, and assist in the tasks related to bidding, which shall be implemented by the Filipino execution agency. The specific tasks are as follows:

- Announcement of Tender
- Distribution of Tender Documents
- Implementation of Tender
- Tender Evaluation
- Assistance of Contract Negotiation with Contractor and Conclusion of Contract

##### **3) Procurement and Administration Task**

The consultant shall implement supervising tasks such as, whether the equipment procured satisfies the technical specification and is properly installed, and whether the process is progressing as scheduled. As an administrative structure, an equipment inspector shall inspect and approve all equipment. Also, a procurement and administrative engineer shall reside on site during the period necessary for installation, acceptance, and delivery.

#### **(5) Quality Management Planning**

The manufacturer, which can manufacture targeted equipment, is the corporate enterprise that is specializing in its equipment, and the management structure, in which the quality of the equipment can be maintained, is established. Accordingly, the equipment installed and adjusted through site acceptance testing (SAT) shall be finally delivered after commissioning tests on site.

## **(6) Procurement Planning**

### **1) Supplier of Equipment**

The equipment procured in this project shall be procured from Japanese manufacturers because they can manufacture the heavy equipment with specifications shown in 2-2-3-1 and the procurement is required to be urgently conducted for early recovery of damaged distribution facilities. No Filipino product to comply with the above condition exists. Also, since targeted heavy equipment requires quality functioning in terms of accuracy and endurance of functionality, the equipment including main parts such as bucket and auger shall be manufactured in countries which become members of the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD). The procured equipment, which has a one year guarantee period and can be operated by Filipino operators and maintained by Filipino mechanics, shall be provided. Since the repair structure is needed even after the guarantee period, a manufacture which has branch office in the Philippines and neighboring countries, is desirable. Furthermore, it is essential to prepare spare parts beforehand for prompt repair. Accordingly, in this project, spare parts for one year shall be procured. Regarding spare parts from the second year on, it is necessary for each EC, which is the maintenance administrator for heavy equipment, to procure them.

### **2) Transportation Planning**

The procured equipment is transported by ship from the port closest to the manufacturing plant in Japan, and landed and passes customs at Manila port. It takes approximate 2 months to transport heavy equipment from Japan to Manila on the sea. On the other hand, the distance between Manila and Tacloban is approximate 700km on the sea and it takes approximate 1 week to transport it using periodical cargo ships. There is no concern about transportation of equipment from Manila to Tacloban.

## **(7) Training Plan for Initial Operation**

The operation method and maintenance procedure of the procured equipment is not different from those used before the devastation. Therefore, operators and mechanics already have basic knowledge and skill. However, since the procured equipment is the latest, the initial guidance and training for operation and maintenance procedures shall be implemented by the engineer from the manufacturer in order to complement the technological capability of operators and mechanics when the heavy equipment is delivered.

## **(8) Implementation Schedule**

### **1) Procurement and Implementation Schedule Planning**

#### **a) Basic Policy**

The equipment procured in this project is intended to be provided for emergent recovery work described in 2-2-3-1, it shall be allocated as soon as possible. The implementation schedule shall be determined to individually proceed each stage such as manufacturing, transportation, installation, adjustment, training, etc.

#### **b) Manufacturing Period**

Each piece of equipment shall be manufactured on an order-to-manufacturing basis. The manufacturer shall move them through the design, manufacturing, and inspection stages after receiving the orders. According to manufacturers, the manufacturing period of both BTwB and BTwD is around 8 months each. (\*BTwB: Boom Truck with Bucket, \*BTwD: Boom Truck with Digger)

#### **c) Transportation Period and Delivery**

The marine transportation period is set to be 60 days in consideration of time loss for waiting ships and transportation distance.

#### **d) The Period Required for Training for Initial Operation and Maintenance Methods, Acceptance, and Delivery**

The procured equipment should promptly start to be operated after installation and adjustment. Accordingly, the training for initial operation and maintenance methods shall be implemented after installation. The period required for the training is 7 days for each piece of heavy equipment.

### **2) Estimation for Procurement and Implementation Schedule**

Based on the policy aforementioned, the implementation schedule for this project is set to be as follows:

	Unit: Months	
	BTwB	BTwD
Equipment Design and Approval :	1.0	1.0
Manufacturing Period :	8.0	8.0
Product Inspection, Inspection before Shipment, Transportation Period :	2.5	2.5
Installation, Commissioning Test, Adjustment, Training, etc :	0.5	0.5
Acceptance Inspection and Hand-over:	0.5	0.5
Total	12.5	12.5

### 3) Procurement and Implementation Schedule Table

The whole project schedule is set to be as follows:

- From contract with consultant to contract with manufacturer: 4.5 months
- From contract with manufacturer to handover: BTwB 12.5 months  
BTwD 12.5 months

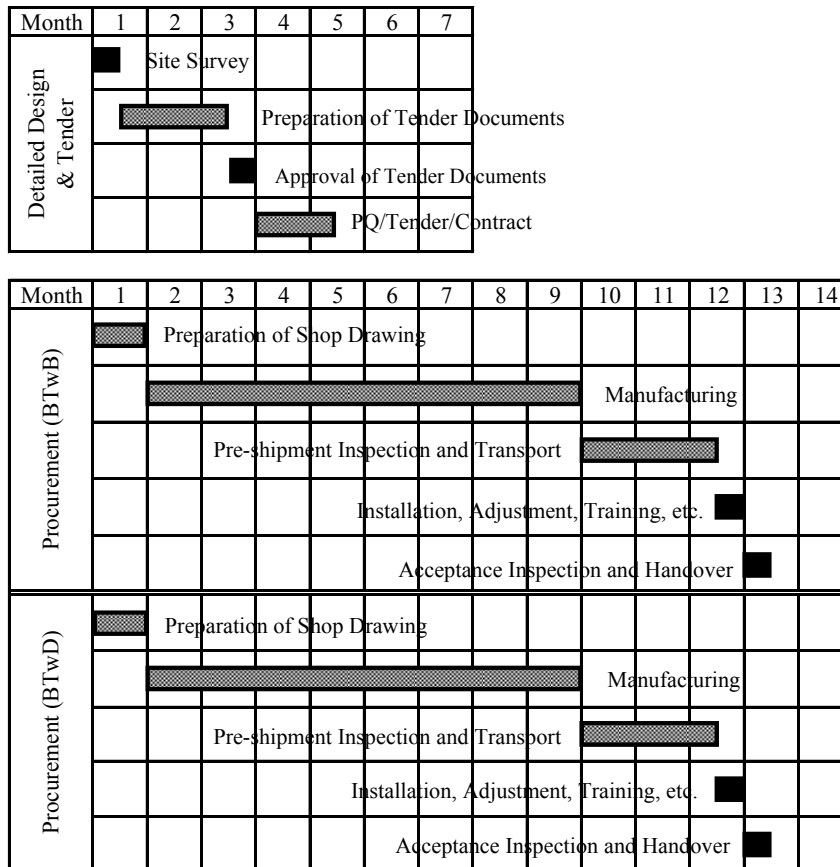


Figure 2-2-11 Project Implementation Schedule (Electricity)

#### 2-2-4 Recovery of Construction Equipment

##### 2-2-4-1 Policy of Plan

###### (1) Basic Policy

First of all, the required equipment list for the devastated area that was submitted by DPWH Region-VIII is studied and evaluated. Equipment should be selected mainly from the view point of effectiveness and adequacy for immediate rehabilitation and recovery activity. Demarcation with other international donors shall be carefully arranged to avoid overlap.

###### (2) Policy on Natural Environmental Conditions

There are no natural environmental issues in this project. Low-emission type construction equipment is recommended for this project.

### **(3) Policy on Socio-economic Conditions**

There are no socio-economic issues in this project.

### **(4) Policy on Procurement Conditions and Business Custom**

#### **1) Transportation Method of Construction Equipment**

All equipment is freighted by sea from Japan to Manila Port and unshipped to clear through customs. After that, it will be carried by ship from Manila to Tacloban port.

After unloading at Tacloban port, it will be transported approximately 15 km by trailer to the equipment storage yards of DPWH Region-VIII office..

#### **2) Conditions of Material Procurement**

At Tacloban, basic materials for construction works, such as soil, cement, reinforcement bar, etc., can be supplied. Detailed investigation, however, is not made at this time since no construction works is included in this project.

### **(5) Policy on Utilization of Local Company**

Construction equipment will be transported from Tacloban port to the equipment storage yards of DPWH Region-VIII office and unloaded by a local company. The local company shall be selected based upon the availability of the company.

### **(6) Policy on Operation & Maintenance**

Implementation agency for this project is DPWH Region-VIII office. Operation and maintenance is the responsibility of the Equipment Management Division of DPWH Region-VIII.

The Equipment Management Division (EMD) covers Leyte province and Samar province of Region-VIII with 6 equipment storage yards in those areas. EMD is responsible for operation and maintenance of all equipment owned by DPWH Region-VIII.

Among those equipment storage yards, the biggest one is in Palo with 54 employees (i.e. 10 Engineers, 18 Mechanics, 5 Operators, 7 Skilled workers and so on) who work for daily, regularly scheduled and as needed maintenance works as usual.

Construction equipment including additional ones which will be granted by this project, are maintained in the above storage facilities, and those will be timely dispatched to each storage yard as needed in an emergency or for disaster prevention.

## **(7) Policy on Construction Equipment Selection**

### **1) Type and amount of Construction Equipment**

Type and amount of construction equipment shall be determined through the discussion with the person in-charge of DPWH Region-VIII office. Construction equipment to be granted is basically selected based on the urgency, adaptability and versatility.

### **2) Status of Equipment after Typhoon Yolanda**

Among existing equipment, some of them have been damaged by typhoon Yolanda. That equipment will be replaced with new ones as the 1st priority based upon the damage survey on them.

## **(8) Policy on Procurement Method and Schedule**

Open tender system shall be adopted in Japan to procure the construction equipment from among Japanese equipment suppliers, trading companies, equipment makers and so on.

Those competitors shall secure the after-care system in the basic condition. And also, they shall be able to dispatch the engineer who can train operators to operate and maintain the equipment at the initial stage.

Construction equipment to be granted shall be made in Japan and/or produced at the overseas factory owned by a Japanese company. In this case also, those companies must have sufficient after-care system for their equipment in the recipient country.

Procurement schedule includes the tender process, shipping and transportation, transfer to Philippine government and so on. It shall be well arranged to transport the construction equipment avoiding the frequent typhoon seasons, i.e. from September to November, in the Philippines. Procurement schedule is planned to be 14.0 months for all the procedures described above.

### **2-2-4-2 Basic Plan (Procurement of Construction Equipment)**

Following the policies aforementioned, the whole plan is formulated having a total view of this project.

#### **(1) Whole Plan**

##### **1) Current Situation of Construction Equipment**

Recently in Tacloban, the rehabilitation and recovery works are ongoing. Currently, most of construction equipment belongs to DPWH Region-VIII office is being used for collection and removal of Debris after Typhoon Yolanda. Some equipment belongs to DPWH Region-VIII office, however, there is not enough for those works and many pieces of construction equipment are borrowed from other regional offices of DPWH from all over the Philippines. The following table

shows the equipment which is being used for the rehabilitation and recovery works in Tacloban city and surroundings.

**Table 2-2-20 Current Equipment Used for Rehabilitation & Recovery (Construction)**

Equipment List	Reg 8	NCR	Reg 3	Reg 4A	Reg 4B	Reg 5	Reg 7	Reg 10	Reg 11	Reg 13	Total out of Reg-8
Dump Truck	13	5	0	0	3	11	0	3	4	5	31
Payloader	6	6	0	0	0	1	0	0	0	0	7
Excavator	2	2	0	0	0	0	0	0	0	0	2
Chain Saw	12	6	9	5	0	11	0	2	0	6	39
Generator Set	2	2	1	0	0	9	0	1	1	1	15
Grader	2	0	0	0	0	0	0	0	0	0	0
Bulldozer	0	0	0	0	0	0	0	0	0	0	0
Crane	1	0	0	0	0	0	0	0	0	0	0
Total	38	21	10	5	3	32	0	6	5	12	94

This table shows that the necessary rehabilitation and recovery works are executed by 38 pieces of equipment that belongs to Region-VIII office and 94 pieces of equipment dispatched from other Regional offices of DPWH additionally.

## 2) Scope and Contents of the Project

To determine the scope of works of the Grant Assistance, (i.e. type and amount of equipment) the study team investigated the equipment currently used by DPWH Region-VIII Office and discussed the equipment additionally required in the near future as shown below.

Furthermore, the following equipment was damaged by Typhoon Yolanda. Those damaged units shall be replaced with new ones as the first priority of this project.

1.	Dump Truck (6~8 cu.m.)	x 3	units
2.	Payloader (1.5 cu.m.)	x 1	unit
3.	Motor Grader (146hp)	x 1	unit
	<b>Total</b>	<b>5</b>	<b>units</b>

Note; Service cars (Pick-up, off-road car) x 25 units were also damaged.

**Table 2-2-21 Type and amount of Equipment Currently Owned by DPWH Region-VIII  
(Construction)**

No.	Equipment Type	Specification	Current Number of Units
1	Bulldozer	265 hp	0
2	Crane	25 ton	1
3	Backhoe(Excavtor)	0.6 m3	1
4	Pay Loader	1.5 m3	5
5	Road Grader	140 hp	1
6	Dump Trucks	6-8 m3, 6 wheeler	10
7	Trailer	-	0
8	Chain Saw	24" & 36 "	3
9	Generator Set *	5 kva-30 kva	154
10	Backhoe/Loader	(Hyundai)	0
11	Submersible Pump	-	0
12	Water Pump	-	2
13	Service Car	-	15
14	Shuttle Bus	-	1
Total Number			193

\*Note: Most of generator set is used for office (emergency) power supply

**Table 2-2-22 Required Equipment List Submitted by DPWH (Construction)**

No.	Equipment Type	Capacity	Number of Units Required
1	Dump truck 6 wheeler	6-8 Cu. m.	10
2	Dump truck 10 wheeler	10-11 Cu. m.	5
3	Payloader	1.5 Cu. m.	5
4	Hydraulic excavator/ Backhoe (Wheel type)	0.28 Cu. m.	4
	Hydraulic excavator/ Backhoe (Crawler Type)	0.28-0.8 Cu.m.	4
5	Road grader(Articulated)	140 hp	5
6	Bulldozer W/Ripper	320 hp	2
7	Bulldozer W/Ripper	225 hp	2
8	Bulldozer	155 hp	2
9	Truck mounted crane	30-35 T	2
10	Standard boom hydraulic	30-35T	2
11	Forkufts	5T	2
12	Forkufts	10T	2
13	Backhoe loader	1.3 U.m. (96 hp)	2
14	Low bed traller W/Prime mover	10-20T	2
15	Self loader (Truck)	10T	2
16	Boom truck	5-10T	2
17	Stake Truck	10T	2
18	Vibratory roller		2
19	Wheel loader(Volvo L180E H16H Lift)	320 hp	2
20	Chaw saw	24-36 Inch	10
21	Generator set diesel	100 KVA	1
22	Generator set diesel	300KVA	1
23	Generator set /Towr lights	6 kW/60Hz/220V	2
24	Road maintainer		5
25	Tire changer hydraulic light & heavy		2
26	Welding machine	300 Amp	2
27	Air compression	150 Psi	2
Total Number			90



**(2) Equipment Plan**

Based upon the equipment list shown above, a series of discussions have been made with the person in charge of DPWH Region VIII office, the following construction equipment will be supplied, in addition to damaged equipment, as the Grant Assistance because of urgency, adaptability and versatility, that is;

- **Urgency:** The debris which is still piled in the temporary stock yard in Tacloban city shall be urgently removed and transported to the final disposal location. It is also quite urgent that the debris which will be generated by the further recovery activities shall be disposed to the proper disposal location.
- **Adaptability:** Before transportation of the debris by DPWH, the debris is separated from the materials which can be used for repair and reconstruction of houses/buildings, such as wooden materials, steel corrugated sheets, other iron materials and so on. Therefore, the debris which is piled in the temporary stock yard cannot be segregated any longer since it is mixed up with garbage from daily life. The equipment which can load up and transport it to the final disposal location, therefore, is definitely necessary rather than the equipment for segregation.
- **Versatility:** After rehabilitation and recovery activity will be completed, DPWH needs the equipment to use for maintenance and construction activity on basic infrastructure continuously.

Besides, a concrete crusher (attachment part) will be procured in order to demolish the remaining concrete buildings and columns which have been damaged by typhoon Yolanda.

**Table 2-2-23 Equipment to be Supplied (Construction)**

	Item	Unit	Remarks
Construction Equipment	Dump Truck (6-8 m <sup>3</sup> )	7	
	Payloader (1.5m <sup>3</sup> )	2	
	Excavator (Wheel: 0.80m <sup>3</sup> )	3	
	Excavator (Crawler: 0.80m <sup>3</sup> )	2	
	Motor Grader (140 hp)	1	
	Concrete Crusher (Attachment)	2	
	Grand Total	17	

After this project, 6 equipment bases of DPWH Region-8 will have at least 1 unit of excavator, 1 unit of payloader and 2 units of dump truck, respectively together with the existing equipment of DPWH. The equipment base of DPWH in Palo which has jurisdiction over the central city of Region-8 and plays central role in the equipment base in Region-8, will have 4 units of dump truck after the project.

This equipment is useful for urgent recovery works, particularly removal of wreckage or urgent rescue work under the wreckage, as well as the disaster prevention activities and maintenance works.

Additionally, the motor grader which was damaged by the typhoon Yolanda is included in the project since it is fundamental equipment in a time of disaster.

### **2-2-4-3 Procurement Plan**

Since this project applies the " Procurement of Equipment Scheme ", the transfer of equipment will be made after initial check and training for operation and maintenance of equipment granted to the Philippine government.

#### **(1) Procurement Policy**

Considering reliability and equipment quality, construction equipment to be granted shall be made in Japan and/or they shall be made in the overseas factory operated by a Japanese company. Those shall be transferred to the Philippine government after initial check and required training at Tacloban.

#### **(2) Remarks on Procurement**

Considering safe mobilization, all equipment is freighted by sea from Japan to Manila Port and unshipped to clear through customs. After that, it will be carried by ship from Manila to Tacloban port. It shall be well arranged to transport the construction equipment avoiding the frequent typhoon seasons, i.e. from September to November, in the Philippines.

#### **(3) Scope of Procurement**

The Japanese side will be responsible for the procurement process until the equipment will be accepted by the Philippine government at the equipment storage yards of DPWH Region-VIII in Palo, Leyte province.

#### **(4) Procurement Management**

In accordance with the general procedures for the Japan's Grant Aid Project, the Consultant will conclude the agreement on the consulting services for the detailed design and procurement supervision for the Project with the implementing agency of the Government of Philippines. After verification of the agreement by the Government of Japan, the Consultant will implement the services as follows:

##### **1) Detailed Design**

Based on the result of the Preparatory Survey, Exchange of Notes, and Grant Agreement for the Project, the Consultant will carry out the review of cost estimation, and preparation of tender documents including drawings Based on the results of the detailed design.

##### **2) Tender Assistance**

The Consultant will confirm with the implementing agency the selection of tenderers and procedure of tender opening, and assist the activities of the implementing agency listed below:

- Notice of tender
- Delivery of tender documents
- Opening of tender
- Evaluation of tender
- Support for negotiation and signing of the contract between the implementing agency and the selected tenderer.

### **3) Procurement Supervision**

The Consultant will supervise conformity of equipment with technical specifications, accuracy of installation, progress of site works, etc. An equipment inspection engineer will review and approve shop drawings of the equipment. A procurement supervisor will stay at the site to supervise installation works to hand-over the equipment.

#### **(5) Quality Control Plan**

Before starting to manufacture the equipment, the consultant shall have meetings with the supplier and makers to discuss closely about the detailed specifications, quality control method and so on.

Before shipment of the equipment, the consultant shall check the number, quality as well as functions. The equipment are to be carefully mobilized until arrival at the designated location without any accidental damages.

Especially, the detailed on road transportation method shall be confirmed carefully with a local company before unloading at Tacloban port.

All equipment shall not be kept a long time under direct sun-shine or in a dusty place. In case that some operational errors are found at the initial inspection, it shall be corrected by the contracted supplier as well as the maker's engineers.

#### **(6) Procurement Plan**

In the Project, all the equipment will be the product of Japan or third countries which can manufacture the product as soon as possible since there are no products in Philippines that conform to specifications. The equipment including main parts such as firefighting pump or X-ray generators shall be products of the member countries of the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD) since a high level of function, accuracy and durability are required for each system.

The equipment will be transported by ship from the port near the factory in the countries of manufacturers such as the Japan, United States, Germany, or France. The equipment will be unloaded at the port of Manila, and will clear through customs. Marine transport will take a maximum of two months. On the other hand, the distance between Manila and Tacloban is approximate 700km on the sea and it takes approximate 1 week to transport it using periodic cargo ships. There is no concern about transportation of equipment from Manila to Tacloban.

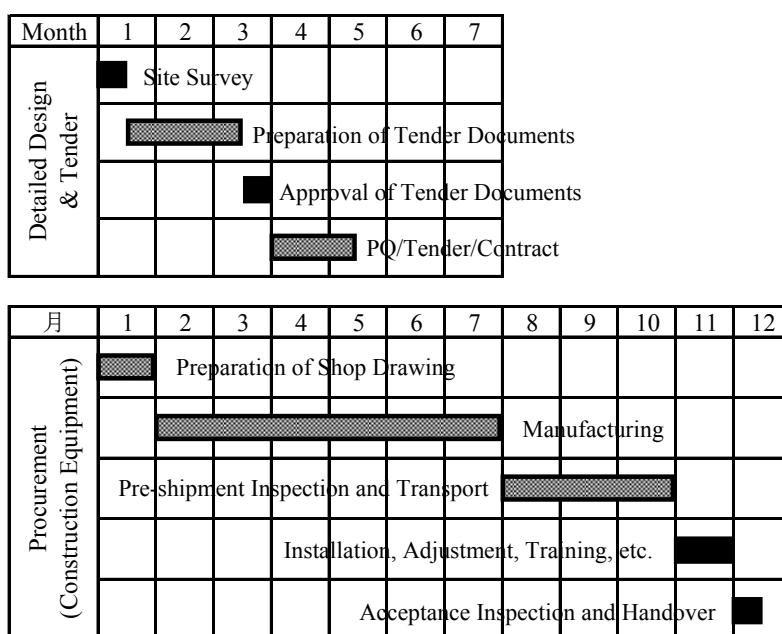
**(7) Initial Operation Training**

At the initial inspection, the maker’s engineer shall conduct initial operation training to the operators who are nominated by DPWH Region-VIII as equipment operator, so that those operators can operate and maintain the equipment well in the future.

**(8) Implementation Schedule**

This project must be executed in compliance with the procurement scheme of JICA and G/A (Grant Agreement) signed by both JICA and Philippine Government.

- From contract with consultant to contract with manufacturer: 4.5 months
- From contract with manufacturer to handover: 11.5 months



**Figure 2-2-12 Project Implementation Schedule (Construction)**

**2-2-5 Rehabilitation of Equipment for National Maritime Polytechnic**

Education and training equipment that were damaged by the typhoon Yolanda are divided to many types. They are also different for the damage situation. Condition of education and training equipment at the time of the mid-February survey was broadly classified as follows; restoration has been carried out already by NMP, restoration is planned, restoration is difficult to budget by NMP.

**2-2-5-1 Design Policy**

As a grant aid target range, the following selection criteria are given below.

- Education and training equipment required by the SOLAS Convention and STCW Convention.

- The education facilities which JICA donated in the past, and they have been used effectively.
- Education and training equipment that can't be recovered by the local government and the Philippine government.
- Equipment to be used for training in accordance with the qualification certificate.

In addition to satisfying these criteria, equipment to be used for education and training related to the life of seafarers and safe operation of the ship has been selected. These trainings are necessary for Filipino seafarers to board the foreign vessels, including Japanese ships.

## **2-2-5-2 Basic Plan**

### **(1) Whole Plan**

On the basis of the provision policy below, replace the education and training equipment with up-to-date equipment as shown in the following table.

Equipment provision policy:

- Policy 1: The education and training equipment required for training of seafarers to satisfy various international Conventions of the STCW, etc.
- Policy 2: Education and training equipment that will be able to correspond with a review in the future. (Review of the education and training equipment is carried out every five years)

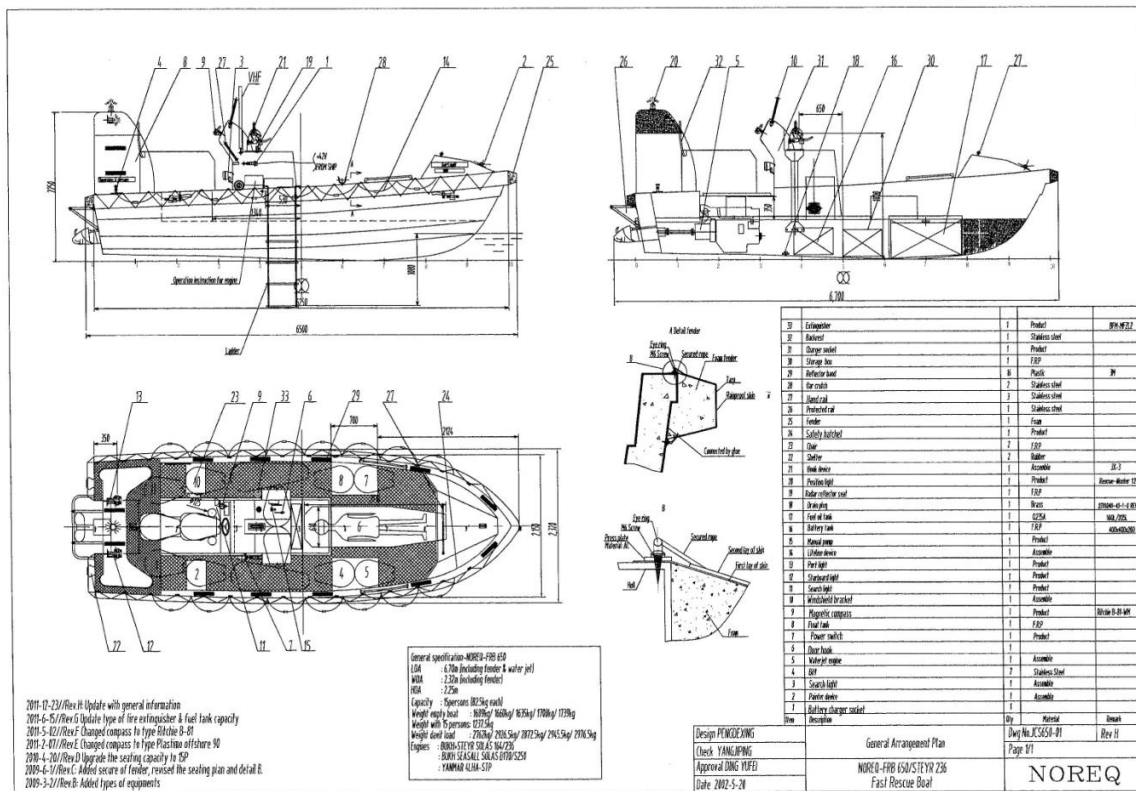
Education and training equipment provided by JICA has been used for 20 years and all is old style or unavailable. Because of limited budget, some equipment among those procured by NMP is general training apparatus or a version for personnel computers and lacks affect for education and training. It is difficult addressing all of the above aspects in this project because of the limited budget. However there is a risk that certificates will not be accepted internationally. So the potential is still present that NMP will seek aid on updating all of its equipment in the future.

### **(2) Equipment Plan**

Overview of education and training equipment to be provided and association specifications are the contents of the next table.

**Table 2-2-24 Overview of Equipment (NMP)**

Items	Specification
Fast rescue boat and Davits	Hull (L:6.35×B:2.3×H:2.3) Capacity 15 persons, with at least 30 knots, propulsion system (outboard motor or water jet)
	Hydraulic telescopic boom crane for ships (Including winch maximum load 30KN)
Totally Enclosed Lifeboat and Davits	Hull (L:5.25×B:2.3×d:1.) Capacity 25 persons, with at least 6 knots, propulsion system (inboard engine)
	Gravity type davits (Including winch maximum load 30KN)
Various Safety Equipment	Fireman's Outfit, Immersion Suit, Manikin, Portable resuscitator kit, Helicopter sling, Distress signal units, Multi Gas Detector
Full Mission Engine Room Simulator	Restoration and refurbishment (Engine room graphic panel, Control room control stand, Failure setting panel and bridge control stand) Add evaluation system
GMDSS (Global Maritime Distress and Safety System) simulator related equipment	MF/HF Receiver with DSC unit, VHF Radio Transmitter/Receiver with DSC, FACSIMILE (weather fax)



**Figure 2-2-13 Example of General View of a High-Speed Rescue Boat (NMP)**

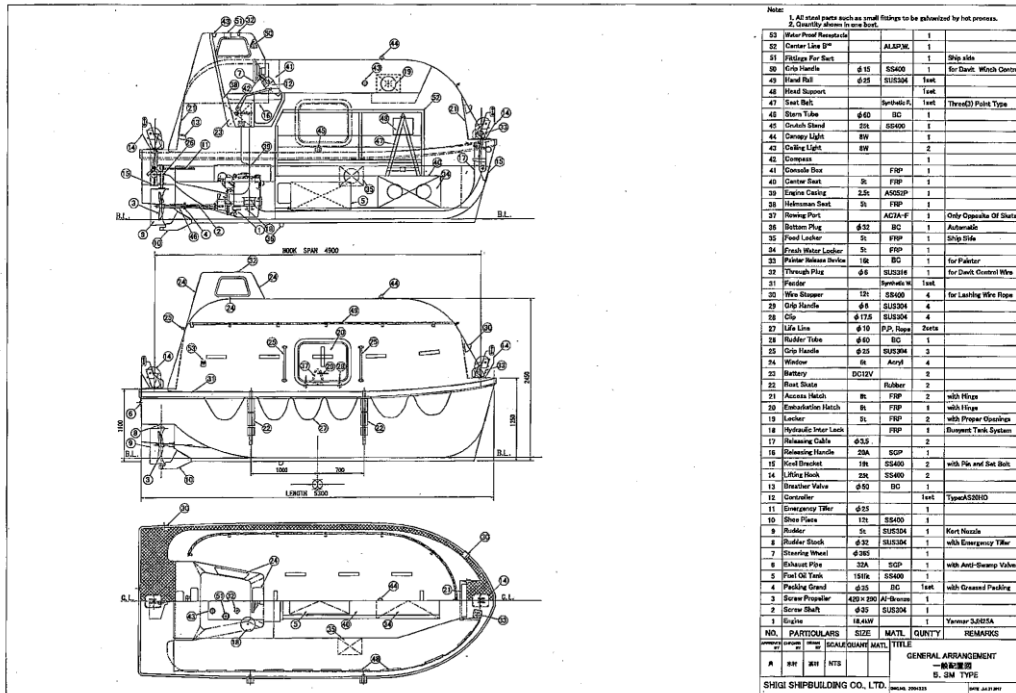


Figure 2-2-14 Example of Overall View of Totally Enclosed Lifeboat (NMP)



Figure 2-2-15 Example of GMDSS Simulator Overall View (NMP)

### (3) Necessity of Equipment

#### 1) High-speed Rescue Boat

In order to fulfill the purpose of saving lives of seafarers, many ships are obliged to carry out the deployment of the high-speed rescue boat. However, a number of injury accidents occur during handling of the high-speed rescue boat. As a result, the qualification certificate is needed for seafarers to use the high speed rescue boat in the STCW Convention. Therefore, demand for the

training for the high-speed rescue boat is increasing. By attending this training, seafarers will be able to operate the high-speed rescue boat safely.

## **2) Totally Enclosed Lifeboat**

Manila amendments to the STCW Convention came into force in 2010. In this revision, basic training in survival has been manifested as necessary ability requirements for seafarers. Therefore basic training in these became the necessary training before the embarkation. In other words, the training using the totally enclosed lifeboat is obligatory for all seafarers. The training using the lifeboat has high demand in NMP.

## **3) Various Safety Equipment**

Various Safety Equipment is used in the training for firefighting and life-saving. They are a part of basic training required for seafarers also the training for Survival. Because seafarers must attend this training to go on board, this equipment is utilized effectively.

## **4) Full Mission Type Engine Room Simulator**

In the Manila amendments of the STCW Convention, the training in engine room resource management (ERM) has been added as mandatory requirements for the ship engineer. STCW Convention also seeks the training in order to enhance the ability of the group in addition to the ability of each individual for safe operation of the vessel. The engine room simulator is used for the training of ERM and watch keeping.

## **5) GMDSS Simulator Related Equipment**

GMDSS automated communication was introduced in 1988, and it has become possible to send a distress signal to an on shore search and rescue agency with one button push. Since 1998, the officer or master of a vessel that should be equipped with wireless equipment has needed the necessary qualifications. GMDSS training has become the training required for boarding as officer.

### **2-2-5-3 Procurement Plan**

#### **(1) Procurement Policy**

“High speed rescue boat and Davits”, “Totally enclosed lifeboat and Davits”, “Various safety equipment” and “GMDSS simulator related equipment” to be procured in this project have not been produced in the Philippines. In addition, a full mission engine room simulator to be restored in this project are made in Japan and were provided previously in the project for the NMP expansion plan. Since the provision of such equipment is intended to be used for emergency recovery work, they will be procured by Japanese manufacture that can promptly procure and allocate them. When the procurement is planned, the equipment, which meet the specification on the bidding documents



and can be easily maintained, and the supporting system is established like the spare parts can be quickly provided when the faults occurred, shall be selected. The engineer of the manufacturer is required to implement the installation, adjustment, commissioning test, and training for initial operation and maintenance.

## (2) Consideration on Procurement

“High speed rescue boat and Davits”, “Totally enclosed lifeboat and Davits”, “Various safety equipment”, “Full mission engine room simulator” and “GMDSS simulator related equipment” are essential education and training equipment that are being used for training related to the issue of certificates that comply with the STCW Convention.

Since these are necessary education and training equipment for early restoration of NMP, the procurement schedule shall be designed as short as possible so as to efficiently complete each step, namely, manufacturing, installation, repair, restoration, commissioning test, training for initial operation and maintenance.

## (3) Classification of Procurement and Installation

Responsibility range of Japan and the Philippines is as shown in the table below.

**Table 2-2-25 Classification of Procurement and Installation (NMP)**

Target	Item	Japan Side	The Philippines Side
Common Items	Procedure of Banking Agreement(B/A) and Authorization to Pay(A/P)		○
	Bearing Duty, Customs Charge		○
	Procurement for Equipment	○	
	Packing and Transportation for Equipment	○	
	Installation, adjustment, and commissioning test for equipment	○	
Fast rescue boat and Totally Enclosed Lifeboat	Ensure the installation site		○
Fast rescue boat	Application for acquisition of ship identification number (If necessary)		○
Totally Enclosed Lifeboat	Application for acquisition of ship identification number (If necessary)		○
Various Safety Equipment	Secure storage location (Warehouse)		○
Full Mission Engine Room Simulator	Restoration and renovation construction work, debugging	○	
GMDSS simulator related equipment	Ensure the installation site		○

## (4) Procurement Administration Planning

According to the implementation procedure of the Japanese grant assistance, the consultant shall enter into agreement with the implementation agency in the Filipino government regarding execution of design and procurement and administration work related to this project, and implement it after obtaining the certification of the Japanese Foreign Ministry.

### **1) Design Work for Implementation**

The consultant shall implement the design work for implementation shown on contract documents based on the findings of this grant aid plan, Exchange of Notes (E/N), and Grant Agreement (G/A).

### **2) Tasks Related to Bidding**

The consultant shall discuss the selection of bidding participants and the method of bidding with the Filipino government execution agency, and assist in the tasks related to bidding, which shall be implemented by the Filipino execution agency. The specific tasks are as follows:

- Announcement of Tender
- Distribution of Tender Documents
- Implementation of Tender
- Tender Evaluation
- Assistance with Contract Negotiation with Contractor and Conclusion of Contract

### **3) Procurement and Administration Task**

The consultant shall implement supervising tasks such as, whether the equipment procured satisfies the technical specification and is properly installed, and whether the process is progressing as scheduled. As an administrative structure, the equipment inspector shall inspect and approve all equipment. Also, the procurement and administrative engineer shall reside on site during the period necessary for installation, acceptance, and delivery.

### **(5) Quality Management Planning**

The manufacturer, which can manufacture the targeted equipment, is the corporate enterprise that is specializing in this equipment, and has the management structure in which the quality of the equipment can be maintained. Accordingly, the equipment installed and adjusted through site acceptance test (SAT) shall be finally delivered after commissioning tests on site.

### **(6) Procurement Planning**

#### **1) Supplier of Equipment**

The equipment procured in this project shall be procured from a Japanese manufacturer because they can manufacture the equipment with specification shown in 2-2-5-1 and the procurement is required to be urgently conducted for early recovery of damaged distribution facilities. No Filipino product to comply with the above condition exists. Also, since targeted equipment requires quality functioning in terms of accuracy and endurance of functionality, the equipment including main parts such as bucket and auger shall be manufactured in countries which become members of the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD). The procured equipment, which has a one year guarantee period and can be

operated by Filipino operators and maintained by Filipino mechanics, shall be provided. Since the repair structure is needed even after guarantee period, the manufacturer, which has a branch office in the Philippines and neighboring countries, is desirable. Furthermore, it is essential to prepare spare parts beforehand for prompt repair. Accordingly, in this project, spare parts for one year shall be procured. Regarding spare parts from the second year on, it is necessary for each EC, which is the maintenance administrator for equipment, to procure them.

## **2) Transportation Planning**

The procured equipment is transported by ship from the port closest to the manufacturing plant in Japan, and landed and passes customs at Manila port. It takes approximate 2 months to transport equipment from Japan to Manila on the sea. On the other hand, the distance between Manila and Tacloban is approximate 700km on the sea and it takes approximately 1 week to transport it using periodic cargo ships. There is no concern about transportation of equipment from Manila to Tacloban.

## **(7) Training Plan for Initial Operation**

The operation method and maintenance procedure of the procured equipment is not different from those used before devastation. Therefore, operators and mechanics already have basic knowledge and skill. However, since the procured equipment is the latest, the initial guidance and training for operation and maintenance procedures shall be implemented by the engineer from the manufacturer in order to complement the technological capability of the operators and mechanics when the equipment is delivered.

## **(8) Implementation Schedule**

### **1) Procurement and Implementation Schedule Planning**

#### **a) Basic Policy**

The equipment procured in this project is intended to be provided for emergency recovery work, therefore it shall be allocated as soon as possible. The implementation schedule shall be determined to individually proceed each stage such as manufacturing, transportation, installation, adjustment, training, etc.

#### **b) Manufacturing Period**

Except some of the various safety equipment, all equipment shall be manufactured based on order-to-manufacturing basis. The manufacturer shall expedite them through the design, manufacturing, and inspection stages after receiving orders. According to manufacturers, the “High speed rescue boat and Davits” is about 8 months, “Totally enclosed lifeboat” is about 8 months, “Various safety equipment” is about 5 months, “GMDSS simulator related

equipment” is about 6 months. In addition, recovery and rehabilitation period of “full mission engine room simulator type” is about 10 months.

**c) Transportation Period and Delivery**

The marine transportation period is set to be 60 days in consideration of the time lost for waiting ships and transportation distance.

**d) The Period Required for Training for Initial Operation and Maintenance Methods, Acceptance, and Delivery**

The procured equipment should promptly start to be operated after installation and adjustment. Accordingly, the training for initial operation and maintenance method shall be implemented after installation. For “High speed rescue boat and Davits”, “Totally enclosed lifeboat and Davits” and “Various safety equipment”, the duration is 7 days altogether. Similarly, “Full mission engine room simulator” is 15 days, and “GMDSS simulator related equipment” is 10 days.

**2) Estimation for Procurement and Implementation Schedule**

Based on the policy aforementioned, the implementation schedule for this project is set to be as follows:

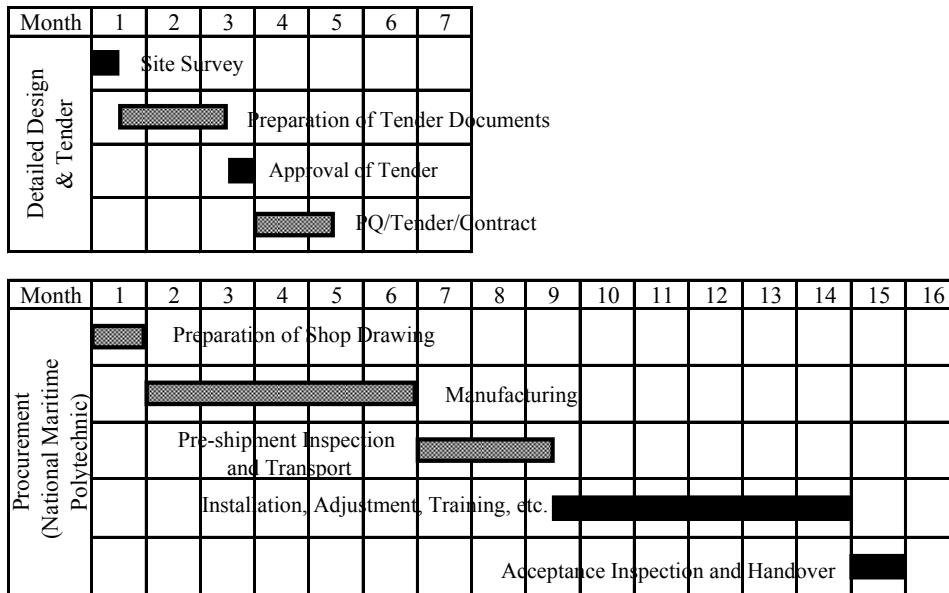
**Table 2-2-26 Procurement Schedule (NMP)**

Item	Fast rescue boat and Davits	Totally enclosed lifeboat	Various safety equipment	Full mission engine room simulator	GMDSS simulator related equipment
Equipment Design and Approval:	1.0months	1.0months	1.0months	1.0months	1.0months
Manufacturing Period:	8.0months	8.0months	5.0months	5.0months	6.0months
Product Inspection, Inspection before Shipment, Transportation Period:	2.5months	2.5months	2.5months	2.5months	2.5months
Installation, Restoration, Commissioning Test, Adjustment, Training, etc:	0.5months	0.5months	0.5months	5.5months	0.5months
Acceptance Inspection and Hand-over:	0.5months	0.5months	0.5months	1.0months	0.5months
Total	12.5months	12.5months	9.5months	15.0months	10.5months

**3) Procurement and Implementation Schedule Table**

The whole project schedule is set to be as follows:

- From contract with consultant to contract with manufacturer: 4.5 months
- From contract with manufacturer to handover:
  - Fast rescue boat and Davits: 12.5 months
  - Totally enclosed lifeboat: 12.5 months
  - Various safety equipment: 9.5 months
  - Full mission engine room simulator: 15.0 months
  - GMDSS simulator related equipment: 10.5 months



**Figure 2-2-16 Project Implementation Schedule (NMP)**

## 2-2-6 Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center

### 2-2-6-1 Design Policy

#### (1) Design Policy

The basic design policy of the Requested Japanese Assistance is listed below.

- In principle, the Project will replace equipment that is no longer used because of typhoon damage.
- The three main activities of the Guiuan Marine Fisheries Development Center, namely 1) distribution of fingerlings to fish farmers, 2) extension of aquaculture technology, 3) fish health and marine environmental monitoring, are the subjects of this Project.
- The Project adopts multi-species and multipurpose designs for the Project components, especially for equipment like fiberglass tanks, microscopes, etc.
- The Project design will be made with special consideration on ease in operation and maintenance as well as reduction in operational cost.
- The natural conditions around the Project site shall be carefully considered in the Project design.

#### (2) Policy on the Natural Conditions

The Project adopts the following policy on the natural conditions.

- The Project equipment being under hot and moist tropical monsoon climatic condition should be designed in consideration of applications of natural ventilation, shading from direct sunlight, etc.

- The Project site being located on the seashore is affected by the sea breeze. The Project designing should consider applications of rustproof measures for the equipment.
- Designing of underwater equipment like water pumps should be made carefully in consideration of the effects of littoral drifting and wave dynamics as well as conservation of the natural environment at the same time.

### **(3) Policy on Procurement of Equipment and Schedule**

The following is the policy on the procurement of the equipment.

- Adopt simple design placing importance on the functionality of the equipment.
- Considering factors including safety, durability, ease in operation and maintenance.
- Equipment poses no problem in terms of parts supply.
- The manufacture, installation, test operation, initial operation training for the equipment should be conducted effectively and promptly.

### **2-2-6-2 Basic Plan (Equipment Plan)**

#### **(1) Overall Plan**

This hatchery/laboratory is the biggest and sole marine fisheries development center in Region VIII. Seedstocks produced from this facility supplies the fish fry and fingerlings and juvenile demands, which are distributed to small cage and pond operators, to the Local Government Unit (LGU) for the Marine Protected Areas (MPA) in their municipal waters, fishers in all of Eastern Visayas and to nearby regions as well.

With the help of other kindhearted donors, BFAR intends to rehabilitate the buildings and facilities of the center. To supplement this initiative, this project comprehensively rehabilitates by replacing the lost equipment that was used in testing and maintaining a supply of good marine water quality as the basic requirement in the operation particularly in the rearing/culturing of the mentioned aquaculture species including the culturing of natural food for the seed stocks in attaining the maximum potential productivity of good quality fish fry and fingerlings.

## (2) Main Equipment by Activity

The main equipment by activity is as given below.

**Table 2-2-27 Main Equipment by Activity (GMFDC)**

Activity	Main Equipment
1. Milkfish hatchery	High density Polyethylene cages (Circular, 10 meters diameter, 225 mm diameter UV Stabilized (HDPE) pipe)
2. Blue swimming crab hatchery	Microscope, trinocular (High luminescent white LED illuminator, CFI optical system)
3. Abalone hatchery	UV lamp complete with ballast and housing
4. Sea cucumber hatchery	Multi water quality parameter tester (DO, pH, ammonium, nitrate, chloride, salinity, TDS, barometric pressure)
5. Giant clam hatchery	Water pump (5 HP engine drive water pump)
6. Scallop hatchery	Fiberglass tank (1 ton, rectangular shape)
7. Phycology Laboratory	Sterilizer (For outdoor, high pressure UV light)
8. Fish health and environmental monitoring	Current meter (direct reading, with water temperature & salinity)
9. Seaweed tissue culture laboratory	Autoclave (Chamber Size: 420mm Dia. X 795 D mm, Capacity: 110 L)
10. Seaweed nursery	Ammonia Meter (Bench top, ISE range 0-19999 ppm, resolution up to 3 digit, accuracy $\pm$ .02 or .05% reading; pH range .1m,)
11. Pearl Island experimental farm	Solar panel (150 watts, 12 volts)
12. Administration (support to hatchery production)	Generator (1000kva, 220 Volts)

### 2-2-6-3 Procurement Plan

#### (1) Procurement Policy

The sources for equipment supply will be widely sought, including Japan and third countries to check the prospects of after-care and parts supply so that equipment of reliable quality can be procured at a favorable cost.

#### (2) Scope of Works

The scope of works of the Japanese side and Pilipino side are summarized in the following table.

**Table 2-2-28 Scope of Works (GMFDC)**

Category	Item	By Japanese Side	By Filipino side
General	Commission for Banking Arrangement (B/A), Authorization to Pay (A/P)		○
	Bearing tax and customs declaration		○
	Procurement for Equipment	○	
	Packing and Transportation for Equipment	○	
	Installation, adjustment, and commissioning test for equipment	○	
Airport rescue and fire fighting vehicles	Secure Storage Space (Garage)		○
	Application for Car License for Road-going		○
X-ray Inspection System and Walk-through Metal Detector	Acquisition of permission for installation of X-ray scanning apparatus from Philippines Department of Health		○
	Power supply to equipment from the existing distribution panel		

### **(3) Procurement Administration Planning**

In accordance with the general procedures for the Japan's Grant Aid Project, the Consultant will conclude the agreement on the consulting services for the detailed design and procurement supervision for the Project with the implementing agency of the Government of Philippines. After verification of the agreement by the Government of Japan, the Consultant will implement the services as follows:

#### **1) Detailed Design**

Based on the result of the Preparatory Survey, Exchange of Notes, and Grant Agreement for the Project, the Consultant will carry out the review of cost estimation, and preparation of tender documents including drawings Based on the results of the detailed design.

#### **2) Tender Assistance**

The Consultant will confirm with the implementing agency the selection of tenderers and procedure of tender opening, and assist in the activities of the implementing agency listed below:

- Notice of tender
- Delivery of tender documents
- Opening of tender
- Evaluation of tender
- Support for negotiation and signing of the contract between the implementing agency and the selected tenderer.

#### **3) Procurement Supervision**

The Consultant will supervise conformity of equipment with technical specifications, accuracy of installation, progress of site works, etc. An equipment inspection engineer will review and approve shop drawings of the equipment. A procurement supervisor will stay at the site to supervise installation works to hand-over of equipment.

#### **(4) Quality Control and Plan**

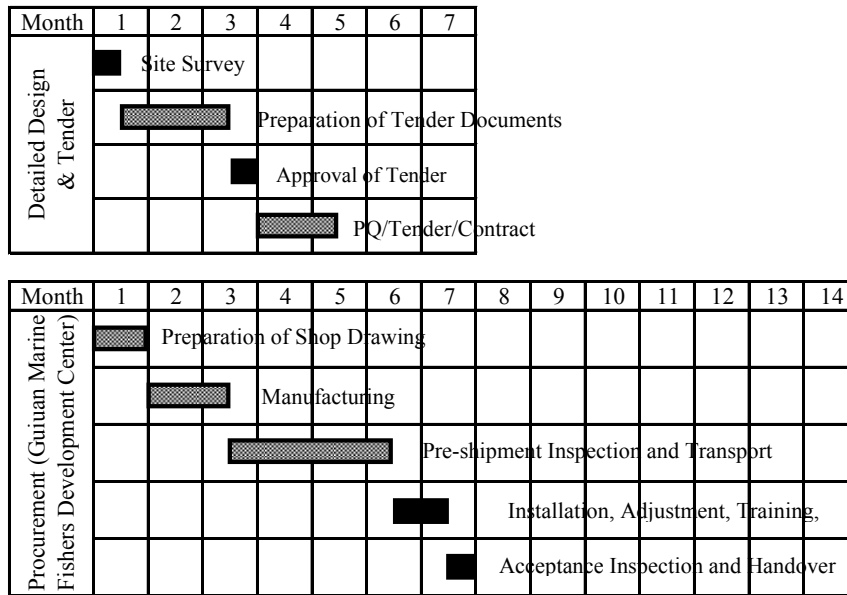
Factory checking of the equipment and operation checking of the equipment after its installation will be conducted. The installation of the equipment at the project site will be witnessed by the equipment supervisor and then specialist engineers will conduct the completion checking and performance checking of each piece of installed equipment prior to the handing over of the equipment to the Philippine side. The same engineers will convey important points for equipment operation and maintenance to the Philippine engineers.

#### **(5) Implementation Schedule**

The whole project schedule is set to be as follows:



- From contract with consultant to contract with manufacturer: 4.5 months
- From contract with manufacturer to handover: 7.0 months



**Figure 2-2-17 Project Implementation Schedule (GMFDC)**

**2-2-7 Rehabilitation of Equipment for Tacloban Airport**

**2-2-7-1 Design Policy**

**(1) Basic Policy**

In order to ensuring the safety of commercial flight service, necessary equipment is selected in accordance with the policies explained below.

**1) Airport Rescue and Fire Fighting Vehicles**

Since all three (3) ARFF were destroyed by the typhoon, Tacloban City diverted one fire fighting vehicle for ordinary fires (only sprays water) and another airport (ILOILO Airport) diverted one ARFF. However, it doesn't meet the international standard. In Annex 14 of the Convention on International Civil Aviation (ICAO) (Aerodromes) and "Airport Services Manual (DOC 9137-AN/898)," an international standard of rescue and firefighting that should be maintained in the aerodrome is provided. International and the domestic airports in the Philippines conform to this international standard based on the classification of the aerodrome (category 1-10), the modality of the fire equipment that should be provided, and minimum quantity, etc., of each size of aircraft that uses the aerodrome are provided in this standard. The firefighting rescue category of the Tacloban airport to which a 320 Airbus type machine (about 38 meters in total length and about 4 meters width of the body) operates is category 6, and the ability requested from it is "two (2) airport rescue

and firefighting vehicles" and "total water tank capacity: 7,900 liters." Therefore, the project will procure the equipment that meets the international requirement.

## **2) Hold baggage X-ray Inspection Systems**

Since two (2) x-ray inspection systems for hold baggage were destroyed, all physical inspections (manual) by security staff have been carried in an emergency manner before check-in. However, the passengers will feel the burden, because the manual check has insufficient quality and takes a long time. The security screening of hold baggage of domestic flights is carried out based on the international flight as provided in the Annex-17 "Security" of convention of International Civil Aviation Organization in order to prevent introduction of explosives in hold baggage. The security screening of hold baggage should be extremely important as the measure for Against Acts of Unlawful Interference to civil aviation, it is necessary to return the system of the security screening to a proper original condition. Therefore, the Project will procure equipment equivalent to the conventional.

## **3) Cabin baggage X-ray Inspection System**

Since 1 x-ray inspection system for cabin baggage at the entrance of the boarding area was destroyed, presently, this security checkpoint (Second check) has ceased temporarily and the above-mentioned first security checkpoint point both composes the initial and final inspection. Therefore, the Project will procure equipment equivalent to the conventional, and the system of the second security checkpoint will be recovered

## **4) Walk-through Metal Detector**

Two (2) walk-through metal detectors for passenger screening had been in service prior to the check-in and the entrance of the boarding area before the typhoon. Because this is essential equipment to detect a hidden weapon , the Project will procure equipment equivalent to the conventional. The quantity of the Walk-Through Metal Detector is the same as the X-ray and it will improve the efficiency with the strengthening of the system.

## **(2) Design Policy under Natural Environmental Condition**

The climate in Tacloban located in Leyte Island in the northeast near the shore of the Philippines is tropical rainforest climate in a tropical area. So the temperature fluctuation is slight and it rains much throughout the year. The temperature and precipitation are as follows:

**Table 2-2-29 Weather Condition in Tacloban (Airport)**

Item	Tacloban
Monthly average maximum temperature (Maximum month)	31.0 deg C. (May)
Monthly average minimum temperature (Minimum month)	23.0 deg C. (January)
Precipitation (Yearly)	2293mm
Precipitation (Monthly Maximum)	305.3mm (December)

Source: World Meteorological Organization

Considering the site natural condition, a tropical rainforest climate, for determining the specification of the equipment used outside, especially, the environmental condition such as high temperature and humidity, heavy rain, strong direct sunlight, and salt injury, should be considered

**(3) Design Policy under Social and Economic Condition**

The civil aviation industry in the Philippines has strongly requested improvement of the safety service and the measures for security. The components of the Project should be the equipment with high priority for improvement of safety and security of aviation.

**(4) Design Policy under Procurement, Business Practice, and Specific Circumstances**

The application to secure licenses for import and installation of X-ray inspection system apparatus such as EDS and vehicle/cargo scanners are to be submitted to the Philippines Department of Health (DOH). Considering that certain equipment may require export permission from the concerned government at the country of manufacturing, the lead time needed for application purposes should be considered when preparing the procurement schedule.

**(5) Design Policy by Utilization of Local Supplier**

The equipment procured by the Project will be installed primarily by the manufacturers. Some companies in the Philippines are maintaining the existing Airport rescue and fire fighting vehicles and security equipment in the airports, and they are available for maintenance of equipment procured by the Project. Some electrical works by the Filipino side are to be executed by local contractors.

**(6) Structure Policy on Operation and Maintenance**

The airport rescue and fire fighting vehicles should be in the proper state which can be dispatched at any time when aircraft accidents occur, therefore, the crash fire and rescue section always has the system for their maintenance. The equipment procured by the Project will be owned by DOTC/CAAP, and maintained by local agents or maintenance companies under maintenance contracts with DOTC/CAAP. They are to be located in the country or in the neighboring countries of the Philippines, and must provide services around the clock throughout the year. Currently,

DOTC/CAAP entrusts maintenance of the existing security equipment to the agents of each manufacturer, and the same procedure should continue

#### **(7) Policy on the Setting of Equipment Grade**

The Airport rescue and fire fighting vehicles and security equipment procured through this project have to meet the ICAO and IATA standard.

#### **(8) Procurement Methodology and Policy on Project Schedule**

All the equipment procured through this project is manufactured on the built -to -order basis. In order to urgently assist the recovery and rehabilitation of the damaged Tacloban airport, prompt delivery and installation of equipment are required. All Equipment will be supplied from the Japanese manufacturer or the overseas manufacturer of the third countries which can manufacture a product as soon as possible.

### **2-2-7-2 Basic Planning (Equipment Planning)**

#### **(1) Overall Plan**

##### **1) Type and Location of Equipment**

Based on the design policies mentioned above, the outline of each piece of equipment and quantity are explained below.

##### **a) Airport Rescue and Fire Fighting Vehicles**

The firefighting rescue category of the Tacloban airport is category 6, and the ability requested from it is "two (2) airport rescue and firefighting vehicles". Therefore, the project procures two and they will meet international standards. Moreover, although the ARFF before the typhoon carried six (6) firefighters into action (one driver, one firefighter) using three (3) vehicles, equipment procured through this project will be selected to ensure the same number of firefighters, this time two (2) vehicles with three (3) or more firefighters (one driver, two firefighters).

##### **b) Hold Baggage X-ray Inspection Systems (First Checkpoint)**

To inspect baggage, X-ray inspection systems with a fixed generator and single view, which can inspect bags of various sizes with a tunnel of more than 100 (w) x 80 (H) cm, is provided at the check-in counter area. The system should have high inspection capability, allowing it to classify organic material (explosives) and inorganic substances (arms) and assist the operator on the monitor via "material identify images processing" and "threat image projection", and it will be the same as the quality before the Typhoon.

**c) Cabin baggage X-ray Inspection System (Second checkpoint)**

To inspect baggage, X-ray inspection systems with a fixed generator and single view, which can inspect cabin bags of various sizes with a tunnel of more than 65 (w) x 41 (H) cm, is provided at the second checkpoint. And, it will be the same as the quality before the Typhoon.

**d) Walk-through Metal Detectors**

To facilitate the physical examination of passengers in the first checkpoint and in the Second checkpoint, the Walk-Through Metal Detector will be installed together with the baggage X-ray inspection system. It should include a multi-zone type function, which can identify the location of weapons as well as functions such as a sensitivity program and settings in accordance with EU and TSA standards.

Based on the design policies mentioned above, the quantity of equipment are explained below.

**Table 2-2-30 Present State and Quantity of Equipment (Airport)**

Equipment	Present state of after Typhoon	Quantity of equipment procured by the Project
1) Airport rescue and fire fighting vehicles (ARFF)	One fire-fighting vehicle for ordinary fires (from Tacloban city) and one ARFF (from Iloilo airport) were emergency diverted.	Two (2) sets. Meets with the international standard.
2) Hold baggage X-ray Inspection Systems (First checkpoint)	All physical inspection was carried out by the security staffs.	Two (2) sets. Return to the original condition.
3) Cabin baggage X-ray Inspection System (Second checkpoint)	The checkpoint does not exist after the typhoon. (Depends on First checkpoint.)	One (1) set. Return to the original condition.
4) Walk-through Metal Detectors (First and Second check	All body searches were carried out by the security staffs.	Three (3) sets. Return to the original condition.

**2) Existing Infrastructure at Project Sites**

Some electrical works for security equipment by the Filipino side are to be executed by local contractors. But because it takes time for the rehabilitation of the public power network, it is expected that the power supply is not adequate, therefore, to supplement the electric power supply for security equipment procured by this project, a compact standby generator (5kVA) will be provided by the project with the main body of the equipment.

**(2) Equipment Planning**

**1) Equipment Planning**

The following table summarizes the intended purpose and principal specifications of each type of equipment procured by the Project.

**Table 2-2-31 List of Equipment Procured by the Project (Airport)**

Name of Equipment	Qty	Installation Site and Purpose of Use	Principal Specification	
Airport rescue and fire fighting vehicles (ARFF)	2 sets	Tacloban airport: Rescue & firefighting facilities React to aircraft incidents	Dimension Overall length Width Height Seats Driving position Gross Vehicle Weight Water tank Foam tank Fire pump capacity Dry powder system Equipment on board  Maximum speed Engine type  Drive Traveling on the general road	12,000mm or less 3,100mm or less 3,900mm or less Driver +2 or more Center or Left hand drive 36,000kg or less 6,000L or more 720 L or more 4,000L/min. or more 250 kg or more In conformity with ICAO standard 100 km/h or more 4-cycle, direct injection, water-cooled, in-line, Diesel engine Four-wheel or six-wheel Meet local road regulations, able to acquire the normal number plate to travel on public roadway.
Hold baggage X-ray Inspection System	2 sets	Tacloban airport: passenger terminal building To inspect hold baggage	Type  System Dimension  Tunnel Size  Conveyor Height Max Conveyor Load Resolution (Wire detectability) Penetration (Steel) Image Processing Function  Power Supply  UPS  AVR  Standby generator Extension Roller	Single-view transmission x-ray equipment 1.5m(W) x 2.2m(H) x 4.0m(L) or less 100cm(W) x 80cm(H) or more 62cm or less 165 kg or more 36AWG or more  27mm or more Automatic visual identification of suspicious items to operator, Gray scale, Threat image projection, Color discrimination of organic/inorganic/metallic material, Edge enhancement, etc. Single-phase 220V±10%, 50 Hz In conformity with IEC standard, 10 minutes holding In conformity with IEC standard Max. output 5kVA, light oil In-feed side and exit side
Cabin baggage X-ray Inspection System	1 set	Tacloban airport: passenger terminal building To inspect cabin baggage	Type  System Dimension  Tunnel Size  Conveyor Height Max Conveyor Load Resolution (Wire detectability) Penetration (Steel) Image Processing Function	Single-view transmission x-ray equipment 1.5m(W) x 1.5m(H) x 3.3m(L) or less 65cm(W) x 41cm(H) or more 82cm or less 100kg or more 38AWG or more  28mm or more Automatic visual identification of suspicious items to operator, Gray scale, Threat image projection, Color discrimination of

Name of Equipment	Qty	Installation Site and Purpose of Use	Principal Specification
			organic/inorganic/metallic material, Edge enhancement, etc. Single-phase 220V±10%, 50 Hz Power Supply In conformity with IEC standard, 10 minutes holding UPS In conformity with IEC standard AVR Max. output 5kVA, light oil In-feed side and exit side Standby generator Extension Roller
Walk-through Metal Detector	3 sets	Tacloban airport: passenger terminal building To inspect passenger	External dimension 92cm(W) x 230cm(H) x 70cm(D) or less Internal dimension 76cm(W) x 210cm(H) x 63cm(D) or less Independent detection zone Multiple (8 zone or more) Object of detection Magnetic, non-magnetic and mixed alloy metal weapons 100 steps or more Sensitivity step Comply with NILECJ-STD-0601.02 Performance evaluation Shall not give a detrimental effect to pacemaker wearer, pregnant women, electrical or electronic devises and magnetic storage media Safety Power Supply Single-phase 220V±10%, 50 Hz UPS In conformity with IEC standard, 10 minutes holding AVR In conformity with IEC standard

## 2) Spare Parts Plan

Airport Rescue and Fire Fighting Vehicles and Security Equipment procured by the Project shall be continuously operated while the airport is under operation. Shutdown of equipment may seriously affect airport operations. Spare parts for each type of equipment must be stocked to minimize down time. Spare parts for each type of equipment will be provided by the Project as recommended by the manufacturer necessary for one year of operation. The warranty period of equipment by manufacturers is one year, which is standard in Japanese Grant Aid Projects. In the warranty period, manufacturers shall supply spare parts necessary for operation under normal conditions, perform periodical inspections, and make preparations for prompt repair when equipment is broken down. After the warranty period, DOTC/CAAP has to conclude a maintenance contract with local agents or maintenance companies for each type of equipment, as well as existing equipment, in order to ensure periodical maintenance and support for prompt repair of failed equipment.

### 2-2-7-3 Implementation Plan

#### (1) Implementation Policy

Airport Rescue and Fire Fighting Vehicles procured in the Project are not produced in the Philippines, and the X-ray Inspection System and Walk-through Metal Detector are not produced in Japan or the Philippines. All equipment will be procured to install at the earliest possible opportunity, since the equipment supplied in this project is needed urgently for short term rehabilitation. Therefore, these will be supplied from the Japanese manufacturer or the overseas manufacture of the third countries which can manufacture a product as soon as possible.

Equipment shall be selected in accordance with the following policies:

- Each piece of equipment satisfies the specifications shown in the tender documents.
- Maintenance of equipment is easy.
- An after-sales service system is established for technical support in case of breakdown of equipment and for prompt supply of spare parts.

Equipment installation, adjustment, commissioning, and initial operation/maintenance guidance shall be executed by the engineers of the manufacturers. Assistance of local laborers will be required for installation works under supervision of the manufacturer's engineers.

#### (2) Implementation Conditions

Since the airport rescue and fire fighting vehicles and X-ray inspection system and walk-through metal detector are intended for safety and security as essential equipment and it is required to installed them to recover the system as soon as possible, the procurement schedule shall be designed as short as possible so as to efficiently complete each step, namely, manufacturing, installation, commissioning test, and training for initial operation and maintenance.

#### (3) Scope of Works

The scope of works of the Japanese side and Filipino side are summarized in the following table.

**Table 2-2-32 Scope of Works (Airport)**

Category	Item	By Japanese Side	By Filipino side
General	Commission for Banking Arrangement (B/A), Authorization to Pay (A/P)		○
	Budget measures for VAT and custom duties, and customs declaration		○
	Procurement for Equipment	○	
	Packing and Transportation for Equipment	○	
	Installation, adjustment, and commissioning test for equipment	○	
Airport rescue and fire fighting vehicles	Secure Storage Space (Garage)		○
	Application for Car License for Road-going		○
X-ray Inspection System and Walk-through Metal Detector	Acquisition of permission for installation of X-ray scanning apparatus from Philippines Department of Health		○
	Power supply to equipment from the existing distribution panel		○



#### **(4) Procurement Administration Planning**

In accordance with the general procedures for the Japan's Grant Aid Project, the Consultant will conclude the agreement on the consulting services for the detailed design and procurement supervision for the Project with the implementing agency of the Government of Philippines. After verification of the agreement by the Government of Japan, the Consultant will implement the services as follows:

##### **1) Detailed Design**

Based on the result of the Preparatory Survey, Exchange of Notes, and Grant Agreement for the Project, the Consultant will carry out the review of the cost estimation, and preparation of tender documents including drawings Based on the results of the detailed design.

##### **2) Tender Assistance**

The Consultant will confirm with the implementing agency the selection of tenderers and procedure of tender opening, and assist in the activities of the implementing agency listed below:

- Notice of tender
- Delivery of tender documents
- Opening of tender
- Evaluation of tender
- Support for negotiation and signing of the contract between the implementing agency and the selected tenderer.

##### **3) Procurement Supervision**

The Consultant will supervise conformity of equipment with technical specifications, accuracy of installation, progress of site works, etc. An equipment inspection engineer will review and approve shop drawings of the equipment. A procurement supervisor will stay at the site to supervise installation works to hand-over of equipment.

#### **(5) Quality Control Plan**

Manufacturers who produce equipment to be procured in the Project are all world-class companies specialized in producing security equipment, and thus, they can control the quality of their products themselves. Therefore, after completion of installation and adjustment, the performance and other aspects of the equipment will be examined at the final Site Acceptance Test (SAT), and delivered.

## **(6) Procurement Plan**

### **1) Procurement of Equipment**

In the Project, all the equipment will be the product of Japan or third countries which can manufacture product as soon as possible since there are no products in the Philippines that conform to the specifications. The equipment including main parts such as firefighting pumps or X-ray generators, shall be products of the member countries of the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD) since a high level of function, accuracy and durability are required for each system.

### **2) Transportation Plan**

The equipment will be transported by ship from the port near the factory in the countries of the manufacturers such as the Japan, United States, Germany, or France. The equipment will be unloaded at the port of Manila, and will clear through customs. Marine transport will take a maximum of two months. On the other hand, the distance between Manila and Tacloban is approximate 700km on the sea and it takes approximately 1 week to transport it using periodical cargo ships. There is no concern about transportation of equipment from Manila to Tacloban.

## **(7) Operational Guidance Plan**

The operation method and maintenance procedure of the procured equipment is not different from those used before the devastation. Therefore, operators and mechanics already have basic knowledge and skill. However, since the procured equipment is the latest, the training for initial operation and maintenance procedures and methods shall be implemented by the engineer from the manufacturer.

## **(8) Implementation Schedule**

### **1) Planning of Implementation Schedule**

#### **a) Basic Policy**

The equipment procured in this project is intended to be provided for urgent recovery work described in 2-2-7-1, it shall be allocated as soon as possible. The implementation schedule shall be determined to individually expedite each stage such as manufacturing, transportation, installation, adjustment, training, etc.

#### **b) Period for Manufacturing of Equipment**

All equipment shall be manufactured based on order-to-manufacture basis. The manufacturer shall expedite them through the design, manufacturing, and inspection stage after receiving the orders. According to the manufacturers, the manufacturing period of the Airport rescue

and fire fighting vehicles is 10 to 12 months, X-ray inspection system is 4 to 5 months. And the manufacturing period of walk-through metal detectors is 2 to 3 months; transport and the installation of the walk-through metal detectors are planned simultaneously with the X-ray inspection system.

**c) Period for Transportation to Site**

The necessary periods for marine transport of equipment are almost the same regardless of the country of origin and embarkation port. It is generally estimated at around 60 days from the countries of origin to the port of the Philippines for all equipment.

**d) Period for Initial Operation Training, Acceptance Inspection, and Hand-Over**

Initial operation training will be executed in parallel with installation works so that installed equipment may be operated as early as possible. Necessary period is four days for airport rescue and fire fighting vehicles and X-ray inspection system, and two days for the Walk-through Metal Detector

**2) Period Necessary for Procurement**

The required duration for the Project is estimated as follows:

**Table 2-2-33 Required Duration for Project (Airport)**

Item	Airport rescue and fire fighting vehicles (Month)	X-ray Inspection System and Walk-through Metal Detector (Month)
Preparation of shop drawings of equipment and approval:	1.0	1.0
Manufacturing of equipment:	11.0	4.0
Factory inspection, pre-shipment inspection and marine transport:	2.5	2.5
Installation, adjustment and operation training:	0.5	1.0
Acceptance inspection and hand-over:	0.5	0.5
Totals	15.5	9.0

**3) Project Implementation Schedule**

The whole project schedule is set to be as follows:

- From contract with consultant to tender announcement : 4.5 months
- From contract with manufacturer to handover:
  - Airport rescue and fire fighting vehicles : 15.5 months
  - X-ray inspection system and Walk-through Metal Detector : 9.0 months

The following figure indicates the implementation schedule for the Project.

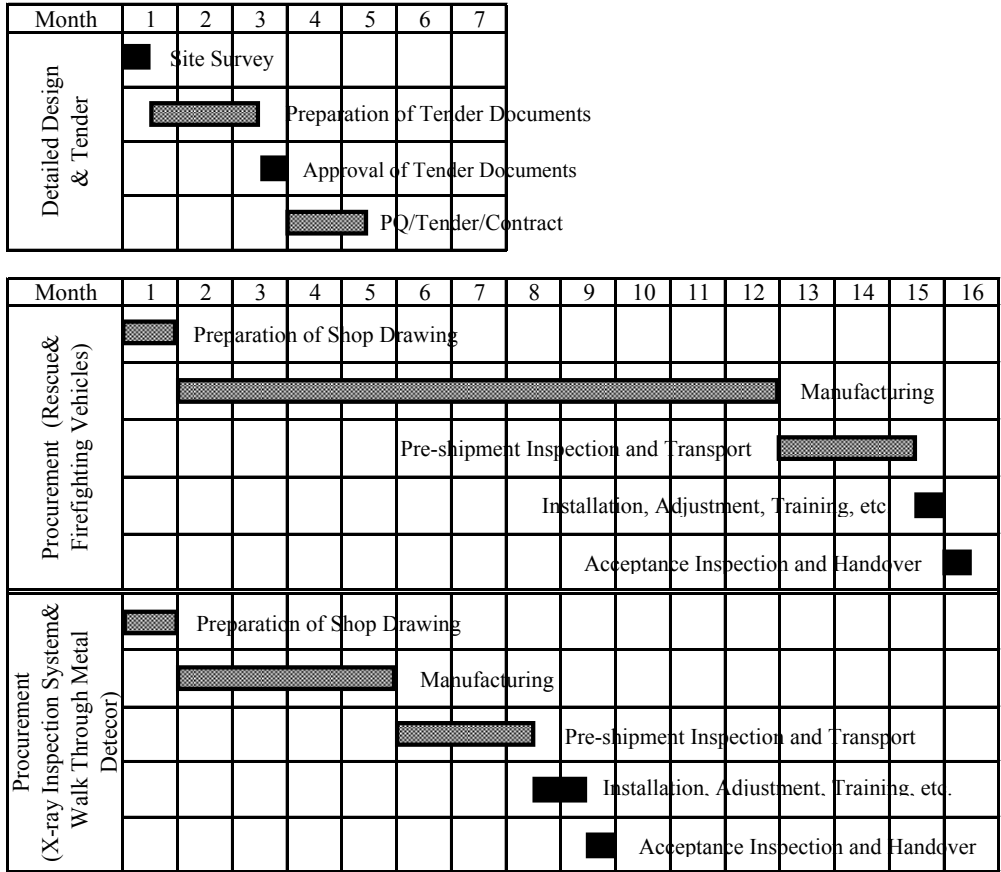


Figure 2-2-18 Project Implementation Schedule (Airport)

2-2-8 Reconstruction of Local Government Offices

2-2-8-1 Design Policy

(1) Design Policy

Based on the discussion with the organization concerned and the survey results, facilities planning on each target site shall be planned with the consideration of the following policies;

Policy-1: The following codes, standards, guidelines and manuals are principally used in establishing design conditions of structures:

- General Regulation: National Building Code of the Philippines (NBCP)
- Fire Code of the Philippines (FCP)
- Structural Regulation: National Structural Code of the Philippines
- Supplementary applicable Japanese practice for building safe structures

Policy-2: Building design nature that is based on the Philippine local practice, the building grade shall be set to enable the adequate selection of materials, construction methods and applicable technique based on the Build-Back-Better policy.

Policy-3: They shall be designed as disaster resistance buildings against seismic and wind load for the function of emergency safety shelter which has a standby generator.

Policy-4: They shall be designed as a public facility which has the function of evacuation shelter for neighboring people.

Policy-5: They shall be designed as facilities that shall allow space for increasing the population in the future by allocating a multifunctional space.

**Table 2-2-34 Summary of Facilities (Local Government Office)**

Location & Name of Facility				Building Type / Scale	Target Size
1	W. Samar	Marabut	Municipal Office	RC, 2 stories (piloti)	829 sqm
2	E. Samar	Lawaan	Municipal Office	RC, single story	829 sqm

**2-2-8-2 Basic Plan (facilities plan)**

**(1) Site Layout Plan**

Two of the target sites for building facilities construction in Marabut (Samar Province) and Lawaan (Eastern Samar Province) are planned in this Project. It is not possible to make a common site plan since each target site is a different distance from the seashore, shape and size and different on-site infrastructures are available. Therefore, the layout plan shall be carried out appropriately in accordance with the basic policies described hereinafter with the consideration of the characteristics of each target site, in order to grasp the detailed site condition, based on the results of a geological survey and topographic survey as well as the conditions of the site including the existing facilities on site and its location.

And, although the target sites for the building facilities construction for this Project are reconstruction on the existing site, it was confirmed that all target sites are legally available for the implementation of the Project and there are no problems with boundary lines since most of the target sites belong to the government (Copies of land registration certificates for all target sites will be received).

**(2) Basic Policy of Site Layout**

The following points shall be considered carefully in preparation of the facilities layout plan:

- The facility layout plan shall be taken in developing the entire plan, which carefully considers the mutual cooperation with the existing facilities and RHU to be constructed by this project.
- The facility layout plan shall be prepared to enable to secure a large open space as much as possible, giving consideration to the future extension on each target site.

### 2-2-8-3 Architectural Planning

#### (1) Components of the Facility

There is no standard basic floor area requirement for the local government facilities because standard design criteria for facilities have not been provided in the Philippines. The office to be required in the Municipal Office is defined to include the following organizations (offices ) in “section 443 of Chapter II Municipal Officials in General” on” Local Government Code of 1991”

**Table 2-2-35 List of Required Offices (Local Government Office)**

No.	Office Name
1	Municipal mayor
2	Municipal Vice mayor
3	Sangguniang bayan members
4	Secretary to the sangguniang bayan
5	Municipal treasurer
6	Municipal assessor
7	Municipal accountant
8	Municipal budget officer
9	Municipal planning and development coordinator
10	Municipal engineer/building official
11	Municipal health officer
12	Municipal civil registrar

In addition, it was mentioned that “the mayor will appoint a municipal administrator, a municipal legal officer, a municipal agriculturist, a municipal environment and natural resources officer, a municipal social welfare and development officer, a municipal architect and a municipal information officer” in this Code.

#### (2) Facility Capacity Planning

The respective scales of necessary rooms will be decided in line with each Municipality’s needs and the operation and management of the Municipal Office. The operation and management structures are required to be in conformance with the staffing plan based on the personnel arrangement and the number of personnel.

#### (3) Floor Plan

Because the Municipal Office will have the function of local government office and also have a shelter function as an evacuation center at the time of the disaster, it shall be planned for these functions. Specifically, it shall be planned as an evacuation space that can be used to avoid the storm and the courtyard and lounge will be the emergency stockyard for relief supplies. The corridor, which is 2.4m wide, around the courtyard is planned to be a temporary evacuation space.

**1) Mayor's Office**

The Mayor Office is planned as the office for the Municipal Mayor, Private Secretary and another 4 to 5 staff.

**2) Human Resources Office**

The Human Resources Office is planned as the office for the head and another 4 to 5 staff.

**3) Vice Mayor's Office**

The Vice Mayor's Office is planned as the office for the Vice Mayor and another 3 to 4 staff. Because the Vice Mayor is operated as an organization that is independent of the government building, rooms is provided in the parliament area.

**4) SB (Sanggun Treasurer Iang Bayan) Office**

The SB office is planned as the office for 10 SB members.

**5) Financial Office**

The Financial office is constituted of four offices, the Budget office, Account Office, Treasurer's Office and Assessor's Office. It is planned as the office for 15 to 18 staff. It is a large room without a partition wall.

**6) Social Welfare Development Office**

The Social Welfare Development Office is planned as the office for 3 to 5 staff. Because it has a counseling service, it is planned to have a private room.

**7) Planning Office**

The Planning Office is planned as the office for 3 to 4 staff.

**8) Civil Registry Office**

The Civil Registry Office is planned as the office for 2 to 3 staff.

**9) Agricultural Office**

The Agricultural Office is planned as the management office for 7 to 9 staff of agriculture and fishery.

**10) Engineering Office**

The Engineering Office is planned as the office for 3 to 5 engineers.

**11) ABC (Association of Barangay Councils) Hall**

The ABC Hall is planned as the meeting room for twenty members of the Barangay Captain. It's also planned as the multipurpose room which can be used for meetings and community activities.

**12) Session Hall**

The Session Hall is planned as the chamber for 10 of the SB members and their staff.

**13) BIR (Bureau of Internal Revenue) Office**

The BIR Office is planned as the office for the local agency of the Department of Finance.

**14) DILG (Department of the Interior and Local Government) Office**

The DILG Office is planned as the office for the local agency of the Department of Interior and Local Government.

**15) Courtyard**

A paved courtyard is planned for use as an evacuation space and stockyard for relief supplies at the time of disaster.

**16) Ramp way**

A ramp way is planned for the Marabut Municipal Office in which the main floor is elevated 3.5m above ground level. A ramp is also planned for the RHU which will be constructed beside the Municipal Office. It will be helpful for pregnant women, wheelchairs and stretchers to access the RHU.

**(4) Required Floor Area**

Required floor area is planned as follows.



**Table 2-2-36 Required Floor Area (Local Government Office)**

Organization	Room Name	Area (sqm)
Municipal Office	Mayor's office	34.5
	Human Resources Office	23.0
	Social Welfare Development Office,	20.1
	Civil Registry Office, Planning Office, Treasurers Office, Accounting Office, Budget Office, Assessors Office, Agricultural Office, Engineering Office	207.3
	ABC Hall	43.2
	BIR Office	23.0
	Electrical & Generator Room	23.0
	Toilet, Pantry	34.5
Legislative	Vice Mayor Office	34.5
	SB members' Office	34.5
	Session Hall	43.2
	DILG Office	14.4
	Toilet, Pantry	20.1
Communal area	Entrance Hall, Corridor, Staircase	274.1
Total		829.4
Piloti (for Marabut Municipal Office)		1,036.8
Ramp way		111.3

**(5) Cross-Section Plan**

It shall be designed disaster resistance building against seismic and wind load for the function of emergency safety shelter for neighboring people as follow;

**1) Roof Design**

**a) Concrete Ridge Frame**

To prevent damage to the steel truss from heavy winds, we introduce a concrete ridge frame into the building. The sloped ceilings along the ridge frame shall maximize its air space and minimize floor-to-floor height, which keeps the room cool and comfortable.

**b) Roof Material**

It will be 0.6 mm thick galvalume (aluminum and zinc - plated) iron sheets taking the advantage of durability and weather-proof into consideration.

**2) Piloti**

In order to minimize the number of victims in the sites close to the coast where high storm surges were recorded during typhoon Yolanda, the floor of the Municipal Office / shelter will be elevated to the second floor level. And it will have a ramp for disabled up to the second floor. Then, the ground floor is a piloti space. In the normal time, the piloti can be utilized as the shaded multi-purpose space for meetings, children's play and etc. free from the rain and the strong sunshine. For those buildings where piloti is not applied, the floor level shall be elevated enough to protect against flooding.

### **3) Courtyard**

A courtyard will be created to actively take natural ventilation and natural light via the aisles and the openings of the rooms.

### **4) Exterior Walls**

The exterior windows of the rooms will be covered with sunshade walls to mitigate direct sunlight into the rooms and protect glass windows and outside A/C units.

The space under the floor around the toilet and bathroom will be a pit. By planning the ground floor level at around GL + 0.5 m, the space under the floor will ensure the necessary height for facility construction and maintenance.

## **(6) Structure Plan**

### **1) Basic Policy of Structural Design**

The structural design will be developed in accordance with the National Structural Code of the Philippines.

In addition, considering the use of the buildings as evacuation shelters at the time of the disaster, 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 (AIJ), containing the latest knowledge of Japan will be referred to.

The basic grids for the square building structure will be 7.2 x 7.2 from the perspective of economy. For the structure type and frame construction, the reinforced concrete rigid frame will be employed. For the exterior walls and partitions in the building, the local concrete block masonry construction will be employed.

### **2) Foundation Structure**

The foundation will be a non-pile foundation. Since the surface soils are uneven and a sufficient bearing capacity of soil cannot be expected, the ground bearing capacity indicated in the soil investigation report will be used as the design capacity.

## **(7) Utility and Building Systems Planning**

### **1) Mechanical and Plumbing Installation**

#### **a) Water Supply System**

The water supply facilities plan for the Municipal office is to store the water received from the existing water supply line in a water tank, and then pump it up to an elevated water tank with a lifting pump. It will then be fed to all locations by gravity. The water tank and elevated water tank will be made of stainless steel, and it is expected that the capacity of the

water tanks will be the equivalent of one day's water usage.

#### **b) Wastewater Sewerage Systems**

The sewage and waste water pipes will be joined and discharged into the 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.

#### **c) Sanitary Fixtures**

It is planned that a western-style toilet basin and a urinal type will be used.

The water supply system to the lavatory basins will employ a "low-tank system", which is a versatile local system that takes into consideration maintenance aspects and water-saving.

#### **d) Fire Fighting Facility**

There are plans to install fire extinguishers, which make it possible to bring the fire under control at an early stage and not to require technically complicated maintenance.

### **2) Heating, Ventilation and Air-Conditioning Systems**

#### **a) Cooling Systems**

Separate systems utilizing a split air conditioner that is energy-efficient and easy to maintain and operate are planned for only office rooms and meeting rooms.

#### **b) Ventilation Systems**

The basic plan is to use natural ventilation. However, ventilating fans are planned for the toilets.

### **3) Power Supply Systems**

#### **a) Power and Transformer Facility**

To enable power distribution in the Municipal Office, a transformer (for stepping down) shall be installed by the Philippine side.

#### **b) Main Cables**

Primary power equipment transmits power from the incoming panel and delivers power to the necessary rooms via a host of distribution panels. Primary power capacity is set to ensure that the voltage drop and current value are adequate to operate the equipment. As a rule, the cable rack method is used as the wiring method inside the shaft. Apart from that, pipe and wire are used.

**c) Power Generator**

A generator capable of operating the electrical equipment in times of blackouts and/or disaster will be provided.

**d) Lighting and Outlets**

This plan considers the use of fluorescent lights as the main type of lighting for all rooms, the entrance hall and corridors for maintenance and running cost reasons.

A circuit is partitioned and installed to handle power socket equipment including general sockets,

**e) Cable Piping for Information Network**

This plan is considering only handling sockets for wireless LAN equipment so that a network can be built within the facility that will one day have Internet access capability.

**f) Public-Address System**

Public-address equipment in this Municipal Office shall be provided to enable emergency calls and communication between staff members. It is able to make a broadcast to alert all facilities simultaneously of a fire by public-address system. Since this greatly aids early evacuation, it will be considered.

**g) Fire Alarm System**

Alarm equipment is considered to be extremely important because it will promptly alert staff of a fire enabling them to be evacuated speedily before the fire spreads.

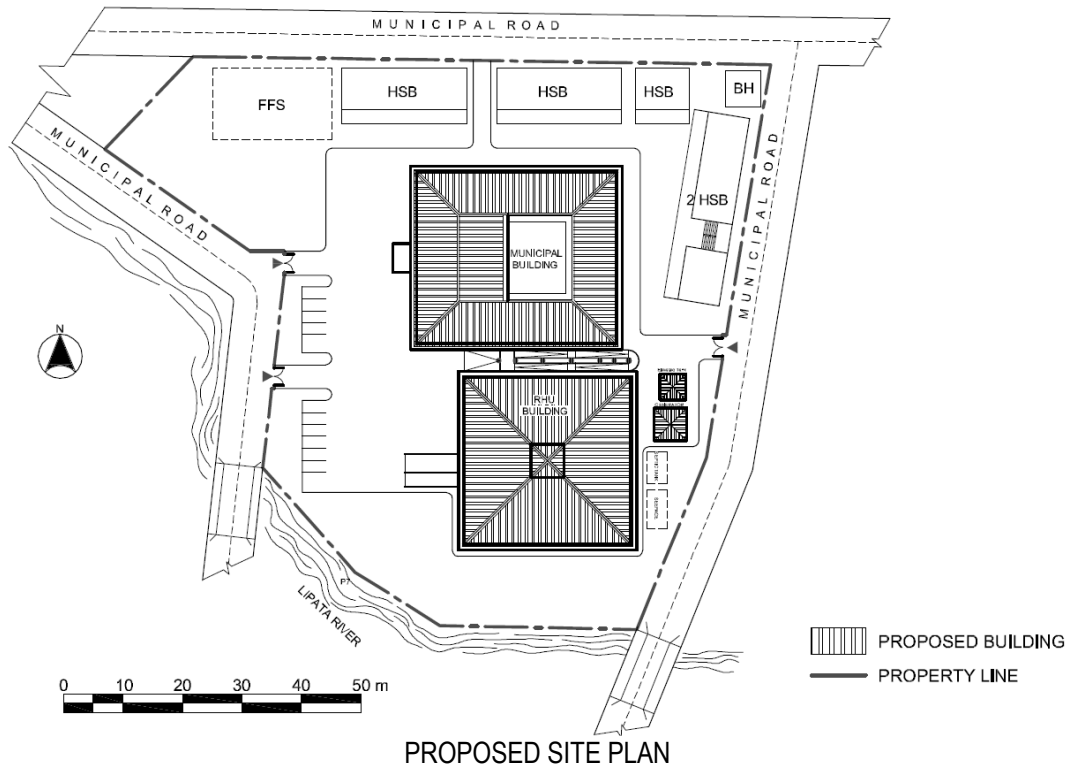
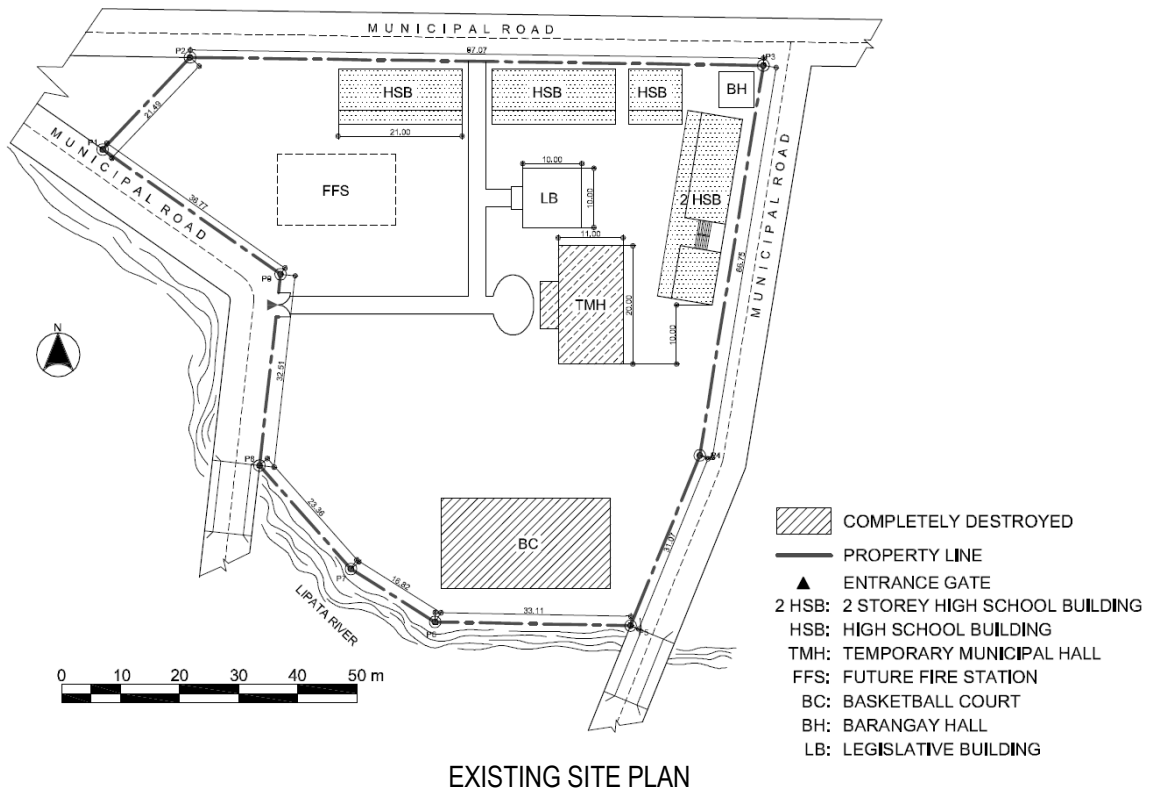
The fire alarm equipment will take into consideration the systems in this country, and be easy to maintain and handle.

**h) Lightning Arrester and Grounding**

Because lightning often strikes in the East Visaya area, lightning rod equipment is needed - especially at a public facility with many people. Equipment to prepare for all accidents, avoid substantial damage and protect buildings as a whole will be considered.

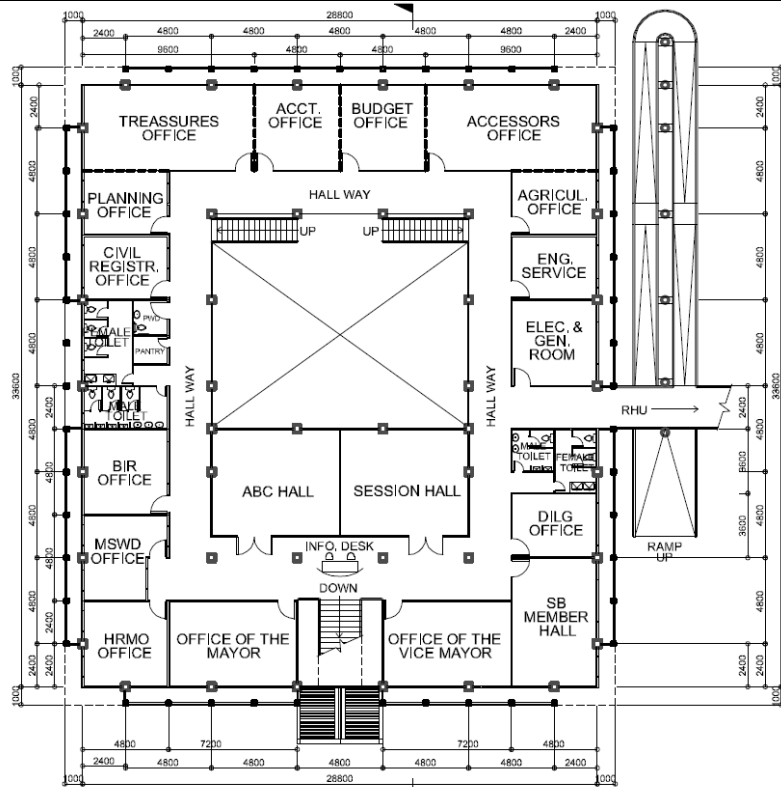
**2-2-8-4 Outline Design Drawing**

The outline design drawing is given in below.

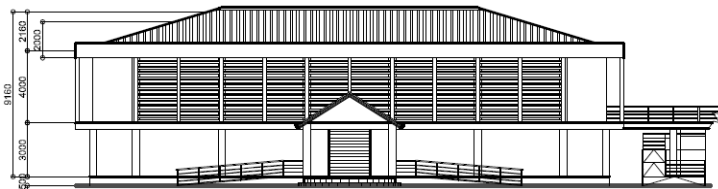


**Figure 2-2-19 Outline Design Drawing (Municipal Office - 1)**

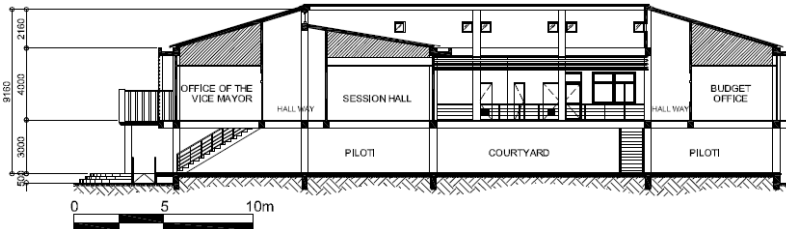
THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	SITE PLANS	Samar, Marabut Municipal Office	1
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PLAN



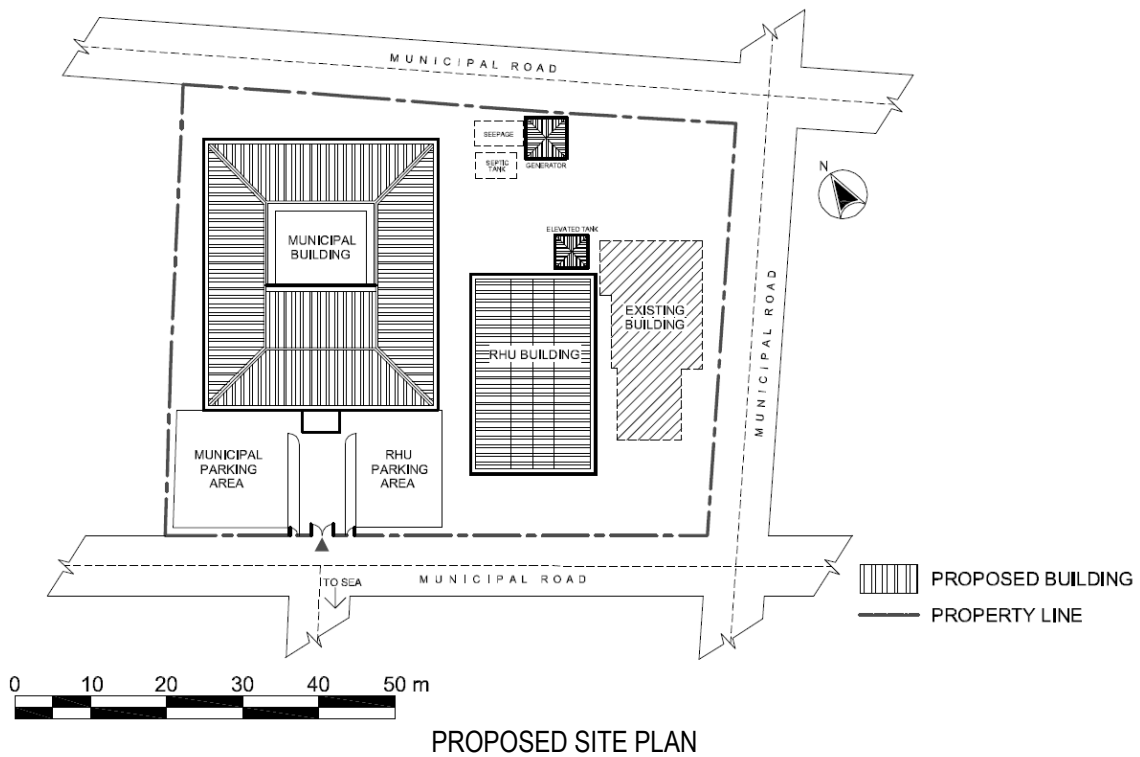
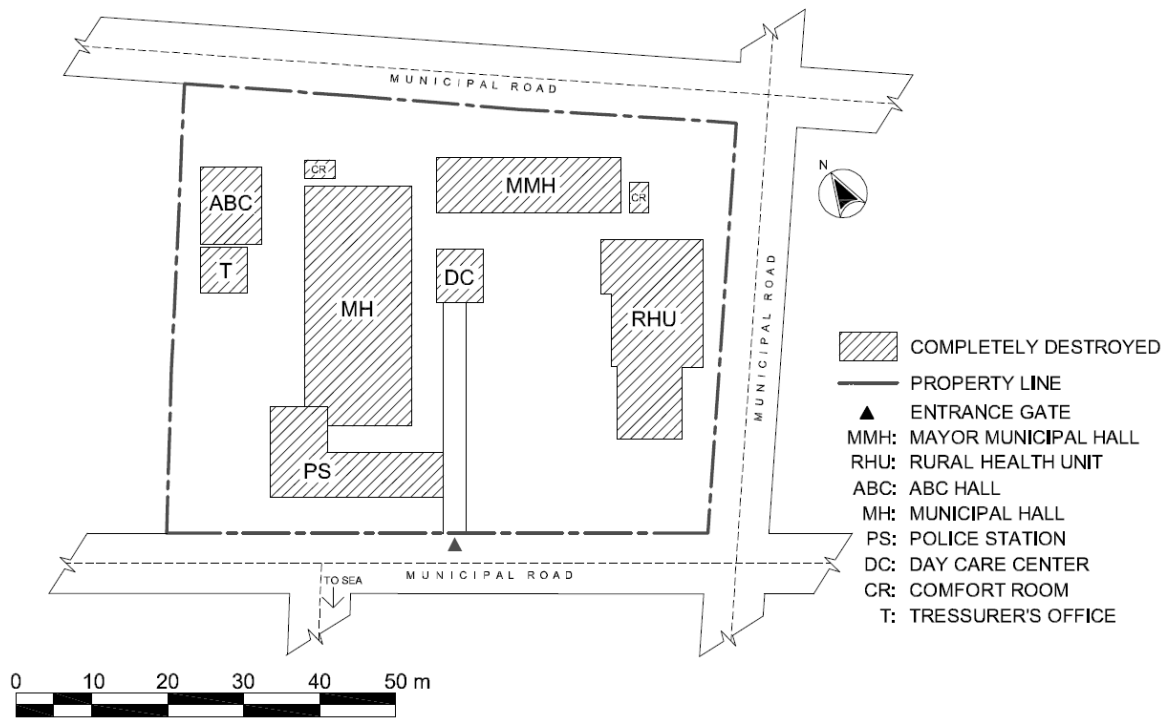
FRONT ELEVATION



SECTION

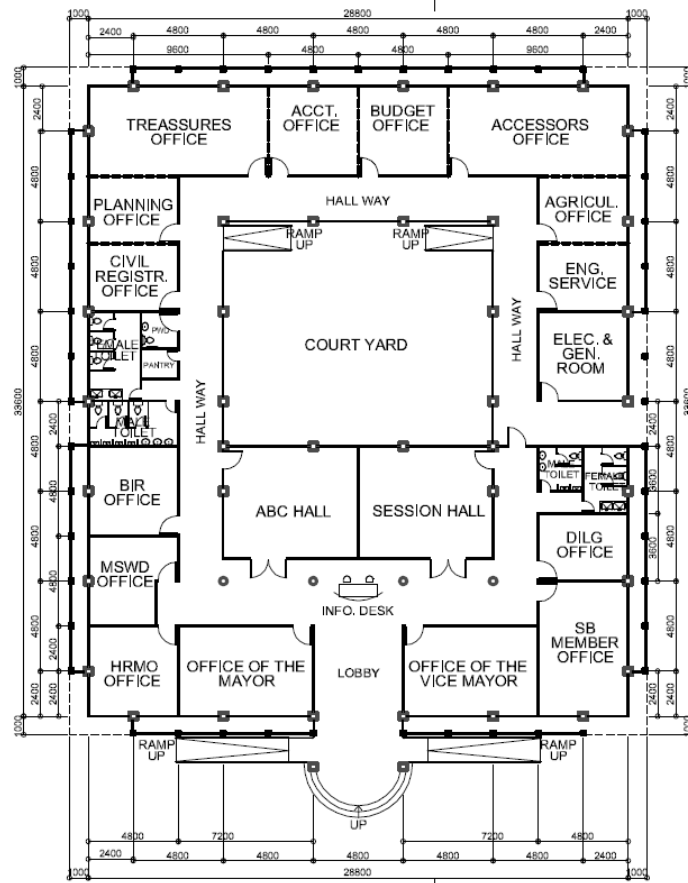
FINISH SCHEDULE		
EXTERIOR	ROOF	GALVALUME IRON SHEET
	WALL	PAINT ON CEMENT MORTAR PLASTERING
	DOOR & PILOTI	STEEL DOOR, WOODEN DOOR, ALUMINUM SASH
		INTERLOCKING BLOCK / PEBBLE WASHOUT FINISH
INTERIOR	FLOOR	TILE
	WALL	PAINT ON CEMENT MORTAR PLASTERING
	CEILING	T-SUSPENSION CEILING + PLASTER BOARDS, PAINT ON

Figure 2-2-20 Outline Design Drawing (Municipal Office - 2)



**Figure 2-2-21 Outline Design Drawing (Municipal Office - 3)**

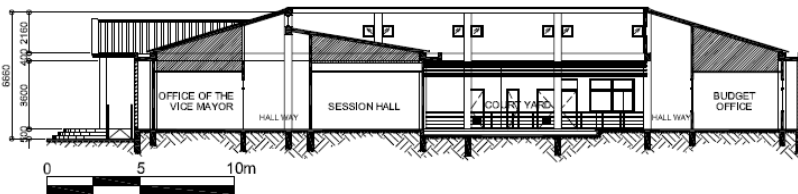
THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	SITE PLANS	Eastern Samar, Lawaan Municipal Office	3
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PLAN



FRONT ELEVATION



SECTION

FINISH SCHEDULE		
EXTERIOR	ROOF	GALVALUME IRON SHEET
	WALL	PAINT ON CEMENT MORTAR PLASTERING
	DOOR & COURTYARD	STEEL DOOR, WOODEN DOOR, ALUMINUM SASH INTERLOCKING BLOCK / PEBBLE WASHOUT FINISH
	FLOOR	TILE
INTERIOR	WALL	PAINT ON CEMENT MORTAR PLASTERING
	CEILING	T-SUSPENSION CEILING + PLASTER BOARDS, PAINT ON

Figure 2-2-22 Outline Design Drawing (Municipal Office - 4)

THE PROJECT ON REHABILITATION AND RECOVERY FROM TYPHOON YOLANDA	BUILDING PLAN, ELEVATION, SECTION	Eastern Samar , Lawaan Municipal Office	4
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## **2-2-8-5 Construction and Procurement Plan**

### **(1) Construction and Procurement Plan**

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.

- In principal, the Japanese commitment to the Project will be funded by the taxes collected from the Japanese people, and implemented under the budgetary system of Japan.
- 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.
- With the assistance of the above-mentioned Consultant, the Province will implement a 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**

- 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.
- The Project will give full attention to safety control, quality control, and schedule control, and utilize the skills of the Japanese contractor.
- The security and theft prevention within the construction site for the overall construction work will be sufficiently considered.
- 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.

### 3) Demolition of Existing Buildings and Removal of On-site Obstacles

As a Grant Aid project, since the existing buildings and underground barrier objects are obstacles for new facility constructions, their removal is normally done by the Recipient country's side. The table below shows necessary demolition and removal works at each site.

**Table 2-2-37 Necessary Demolition and Removal Works at Each Site  
(Local Government Office)**

No.	Site Name	obstacle
1	MARABUT Municipal Office	RC structure (Single story, 2 buildings, : 320 m <sup>2</sup> )
2	LAWAAN Municipal Office	RC structure (2story 1 building : 360 m <sup>2</sup> ) RC structure (single story, 5 buildings : 800 m <sup>2</sup> )

### (2) Points to be Regarded for Construction and Procurement

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.

- 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 existing buildings in relation to the construction site.
- Since the construction will be either an extension or reconstruction in the existing sites, safety measures will be taken by separating the traffic related to construction and that of the others, and by separating the entrances as much as possible.
- 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.

### (3) Demarcation of Construction and Procurement

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

- Construction of the facilities in the Project (2 Municipal Office sites)
- Dismantling and clearing obstacles at the construction sites (including underground obstacles)

#### 2) Construction and Procurement to be Undertaken by the Philippine Side

- Acquisition of the construction sites
- Arrangement for a storage yard for construction material

- Application for and supply of temporary electricity
- Installation of permanent electricity and city water connections
- Bearing value add tax

#### **(4) Construction Supervision Plan (Municipal Office)**

##### **1) Detailed Design Stage**

Because of the fast track project, the Consultant shall prepare the Detailed Design documents consisting of the drawings, specifications, and bill of quantities in a short time. During this stage, the Consultant will work mainly in Japan, and make business trips to the Philippines for Detail Design Survey and obtaining the approval for the final tender documents by the Philippine side before going on to the tender stage.

##### **2) Tendering Stage**

After the Detailed Design stage, pre-qualification screening for the tender will take place in Japan. Based on the results, the Philippine side will invite the participating contractors and carry out the tender in the presence of the people concerned. The tenderer who proposes the lowest price will be the successful tenderer, and enter into a construction contract with the Philippine side.

##### **3) Construction Supervision Plan**

The supervision of the Project will be put into practice using a two-fold system of general supervision and resident supervision.

###### **a) 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.

###### **b) Supervision in the Philippines**

A Japanese architect with relevant supervising experience will be stationed in the Province and work with the local engineers 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 Philippine side.

The resident supervision office will be set up in Tacloban 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.

## (5) Quality Control

In compliance with the supervision plan and the drawings and specifications, an examination of the execution 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 the table below.

**Table 2-2-38 Principal Quality Control Items (Local Government Office)**

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 DPWH regional office or private laboratory (Quantum Testing Laboratory). However, testing equipment of DPWH has been damaged by the typhoon and cannot be used temporarily. 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 laboratory for a compression test.

## (6) Procurement of Machinery and Materials

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 Tacloban city, there is no concern about procurement. In case particular items are out of stock, they could easily be procured by land from Metropolitan Manila or Cebu city. 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 Table3-2-6.

**Table 2-2-39 List of Material to be Locally Procured (Local Government Office)**

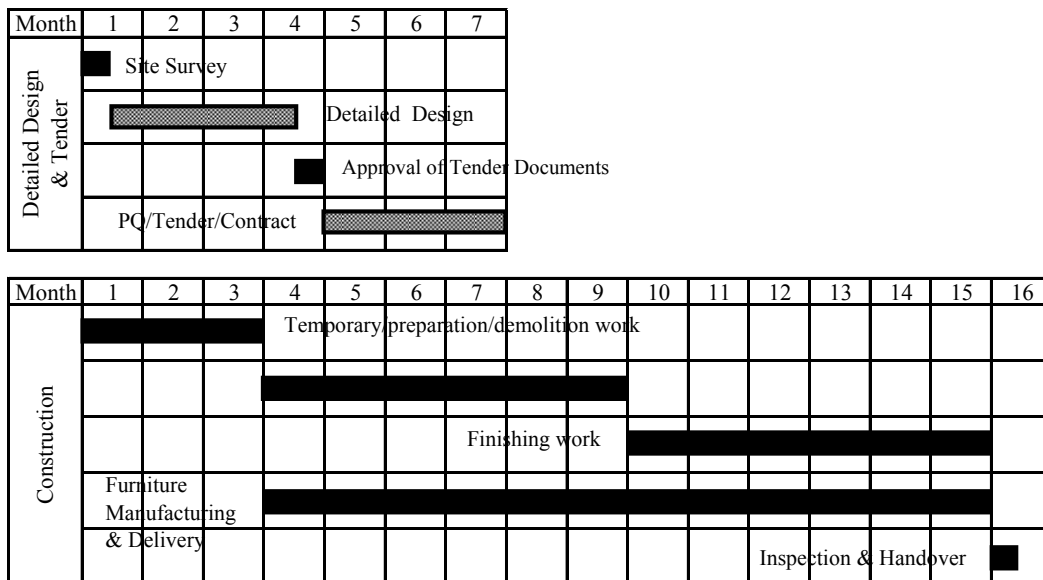
Items	Domestic	Import	Original country
Architectural material			
Portland cement	○		
Plaster	○		
Concrete aggregate	○		
Deformed steel bar	○		
Steel	○		
Form material	○		
Concrete block	○		
Galvalume steel plate for roof	○		
Ceramic tile	○	○	China
Wood	○		
Steel door and window	○		
Aluminum door and 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	○		
Material for plumbing work			
Galvanized steel pipe	○		
Valve	○		
PVC pipe	○		
Sanitary ware	○	○	China

**(7) Execution Schedule**

As the result of aforesaid analyses, the execution schedule of the Project is set as shown in the figure below.

- From the consultant agreement to the construction contract : 7.0 months
- From the construction contract to the handover : 15.5 months

(Including demolition of existing concrete slabs, foundation and etc.)



**Figure 2-2-23 Implementation Schedule (Local Government Office)**

## **2-3 Obligations of Recipient Country**

### **2-3-1 Reconstruction of Elementary Schools**

#### **2-3-1-1 Measures Concerning Various Agreements**

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

#### **2-3-1-2 Measures to be Undertaken for the Implementation of Construction**

- To prepare the necessary land for the Project and to provide a copy of the land ownership or lease certificates.
- To acquire the building permit. DPWH is responsible for this matter, including the application fee charged by the Local Government Units (LGUs).
- 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.
- To provide the connection for electricity, waterworks, telephone lines, and other installations necessary for the new facilities.

#### **2-3-2 Reconstruction of Medical Facilities**

- Acquisition of the ownership of construction sites
- Obtain any permission for the Construction
- Arrangement for prompt procedure of importation and customs
- To accommodate immigration clearance to enter into the Philippines due to the contract between the procurement company and procurement authority.
- Arrangement of bearing taxation for the material for the Project in the Philippines
- The Philippine Government shall be accountable for the Philippine portion

#### **2-3-3 Rehabilitation of Electricity Equipments**

The Filipino side is required to implement the items shown below at the predetermined time based on the Table 2-2-19 when this project is implemented as a Japanese grant-assistance project. This work to be done by the Filipino side doesn't include large-scale construction work and technically

difficult construction work and there is no concern for implementation on the Filipino side. In terms of budget, there is no concern considering the budget and balance of the execution agent, DOE.

**Table 2-3-1 Summary of Work to be done by the Philippines (Electricity)**

Item	Implementation Period	Implementation Item
Stock Space (Garage)	By commencement of installation of heavy equipment	Securing Parking Space
Various Procedures	Time of Implementation Design	Procedure of Banking Agreement(B/A) and Authorization to Pay(A/P)
	Time of Procurement	Budget measures for VAT and custom duties, and customs declaration
	By commencement of installation of heavy equipment	Application for Car License for Road-going

#### **2-3-4 Recovery of Construction Equipment**

Obligations of the recipient country, i.e. the Republic of the Philippines, in this project are listed mainly as below.

- Complying with the contents of G/A, all taxes, such as Value Add Tax (VAT), customs duty, import duty and so on, for procurement of construction equipment from Japan to the Philippines, shall be bore. Accordingly, the Philippine government shall secure and proceed the bearing tax for the equipment on time.
- Providing proper storage facility for the equipment to prevent direct sun-shine, rain and winds.
- Smoothly proceeding unloading/loading of equipment at Manila port, clearance of customs and bearing tax without any idle time.
- Adequately operating and maintaining all equipment granted in this project with full effort. Necessary manpower and budgets for operation and maintenance must be provided on time.
- Any equipment granted in this project cannot be exported/re-imported from/to the Republic of the Philippines.
- Including the initial test and training, cost for fuel for the equipment shall be covered by DPWH Region-VIII office.

#### **2-3-5 Rehabilitation of Equipment for National Maritime Polytechnic**

For the equipment to be provided by JICA, the burden of the following is generated.

- To ensure a safe place in the buildings for storage and installation locations for the provided equipment.
- To ensure a safe place in the buildings for the storage and installation location of provided equipment.
- To ensure a storage location for the materials to be used for restoration work.
- To ensure room for the workers for the restoration work.

- To supply electricity and water, necessary for the restoration work.
- To support the convenience of businesses associated with the restoration work. (Telephone, copy and etc.)
- To carry out the operation and the maintenance of provided equipment.

#### **2-3-6 Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center**

- Reconstruction / repair of buildings and facilities including the Pearl Farm (Pearl Island) of the GMFDC.
- Acquisition of all approvals and permits necessary for implementation of the Project.
- Prompt conclusion of the Banking Arrangement and issuing of Authorization to Pay required for the implementation of the Project.
- Securing of swift customs clearance and bearing tax arrangements necessary for implementation of the Project and procurement of the equipment.
- Arrangement of bearing all tax and any other surcharges that would be levied on Japanese workers and Japanese corporations rendering the equipment procurement and services that are related to the Project in the Philippines.
- Issuing of entry and stay permits required for implementation of the Project to the Japanese personnel.
- Procurement of office furniture and equipment, telephone and internet communication equipment and other equipment that are to be installed in the Administration building and other facilities.
- Rehabilitation of power, water supply and telephone lines.
- Payment of all financial costs that are not included in the Japanese Grand Aid but required for implementation of the Project.

#### **2-3-7 Rehabilitation of Equipment for Tacloban Airport**

##### **2-3-7-1 Outline of Obligations of the Philippine Side**

The Philippine side shall be responsible for execution of the obligations listed in the table below upon implementation of the Project with Japanese grant aid, which are based on the scope of works for both sides mentioned in Section 2-2-7-3. Since these obligations do not include large-scale construction works or technically complicated works, there are no significant problems expected regarding implementation by the Philippine side. Since the financial results of DOTC/CAAP indicate sufficient surplus, the budget for implementation of these obligations will be prepared without major problems.



**Table 2-3-2 Obligations of Philippine Side (Airport)**

Category	Timing	Obligations
Storage location (Garage)	Before commencement of installation of Airport rescue and firefighting vehicles	Removal of items such as destroyed materials with CFR, Repair of rescue & firefighting facilities
Electrical Works	Before Commencement of Security Equipment Installation	Power supply to equipment from the existing distribution panels
Administrative Procedures	At Commencement of Consulting Services	Commission for Banking Arrangement (B/A) and Authorization to Pay (A/P)
	At Procurement of Equipment	Bearing tax and customs declaration
	Before Commencement of Security Equipment Installation	Acquisition of permission for installation of X-ray scanning apparatus from Philippines Department of Health

**2-3-7-2 Electrical Works for Security Equipment by Philippine Side**

The obligations of installation equipment do not include large-scale construction works or technically complicated works, therefore there are no significant problems expected regarding implementation by the Philippine side. The Philippine side is going to carry out the repair such as damaged passenger terminal building and related equipment, etc. within 2014, but because it takes time for the rehabilitation of a public power network, it is expected that the power supply is not adequate. Therefore, to supplement the electric power supply for the security equipment procured by this project, a compact standby generator (5kVA), uninterruptible power supply (UPS), and automatic voltage regulators (AVR) are procured by the project with the main body of the equipment.

**2-3-8 Reconstruction of Local Government Offices**

**2-3-8-1 Measures Concerning Various Agreements**

- According to banking arrangements with a bank based in Japan, the recipient side should pay the necessary handling charge for the issuance of Authority to Pay (A/P) and the bank commission.
- The Philippine side shall bear 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.
- 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.

**2-3-8-2 Measures to be Undertaken for the Implementation of Construction**

- To prepare the necessary land for the Project and to provide a copy of the land ownership or lease certificates.
- To acquire the building permit. DPWH is responsible for this matter, including the application fee charged by the Local Government Units (LGUs).

- To construct the temporary Municipal Office to use during the construction period.
- To provide the physical move from the Existing Municipal Office to the temporary Municipal Office before construction and from the temporary Municipal Office to the new Municipal Office after completion of the new facilities.
- 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.
- To provide the connection for electricity, waterworks, telephone lines, and other installations necessary for the new facilities.

## **2-4 Project Operation Plan**

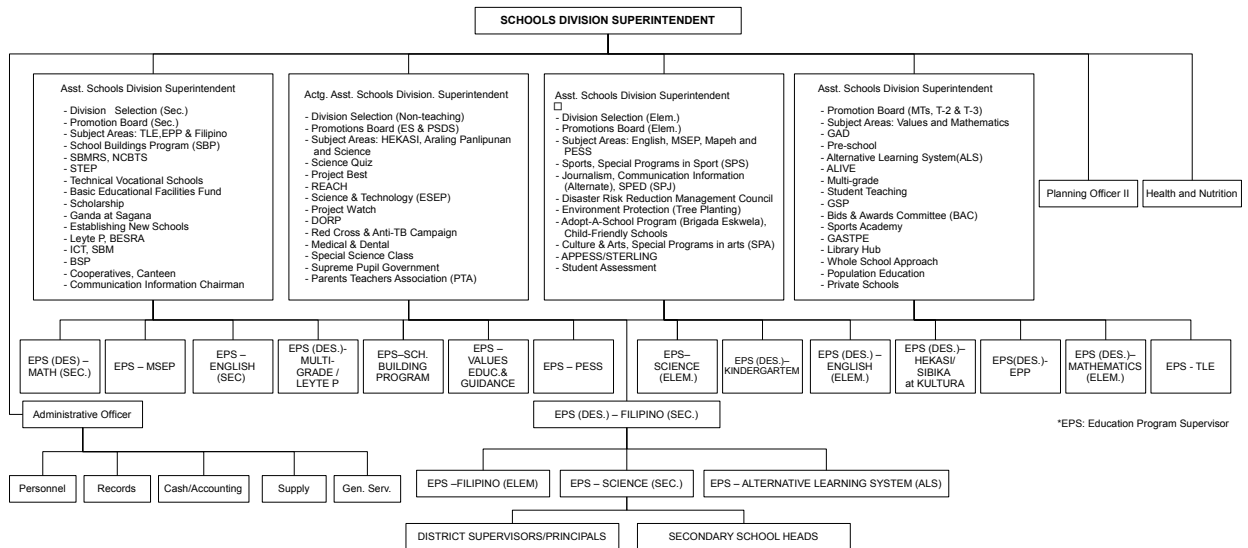
### **2-4-1 Reconstruction of Elementary Schools**

#### **2-4-1-1 Organization and Staffing for Operation and Maintenance**

##### **(1) Operation and Maintenance of Public Schools in the Philippines**

Operation and daily maintenance of public schools in the Philippines is carried out at each school under the Ministry of Education (DepEd). On the other hand, the need for large-scale repairs, new construction, and building extension is determined by DepEd Division Office, and it sends a request for same to DepEd Regional Office. The regional office considers all requests within the jurisdiction of 6 provinces, to determine annual budget allocation for each division office with the consent of the central government. The approved requests are going to be carried out by each division office.

The organization chart of the DepEd Leyte Division Office is shown in Figure 2-4-1. The other provinces have the same organizational structure, however the organization chart is different from the system of the DepEd Regional Office. Therefore, it is under review in order to match the regional office for the purpose of operating efficiency. There is a plan to migrate to the new system by the end of June in this year.



**Figure 2-4-1 Organization Chart of Department of Education, Division of Leyte**

**(2) Operation and Maintenance of Target Schools**

The division office has an EPS (Education Program Supervisor) that focuses on education courses and it includes a school building program officer. They have a strong connection with each school site through their activities and monitoring school facilities is also one of their services. The monitoring system will continue after the change in the organization chart. The school building program officer compiles monitoring information from each EPS, and then undertakes additional research as necessary with an engineer that is dispatched to division office from the central government. The results are shared with the regional office.

The new organizational structure plans to establish a new independent section of school facility management to enhance the monitoring and management system. And a new position of school building program officer that is the Physical Facility Coordinator has begun to be used in the division office already.

When large-scale repair is required, division office is requested in the same way as for new construction and building extension projects from each school. The division office considers the requests from each school along with the annual budget plan utilizing the daily monitoring results and the Basic Education Information System (BEIS) database that summarizes the number of students, number of teachers, number of classes, etc. The result of the review is submitted to the regional office.

Daily operation and maintenance budget is allocated to each school by the division office, based on the BEIS database. Each school carries out daily maintenance including replacement of broken glass, roof repair, and maintenance of painting. The school also asks private companies to repair as necessary.

In case of the situation of new construction and building extension, if budget is allocated to the Department of Public Works and Highways (DPWH), the DPWH Regional Office is responsible to adjust selection of the school, design, bidding, construction supervision with the DepEd Regional

Office. DepEd Regional Office conducts the monitoring of construction. There is also a joint final inspection of building construction prior to completion. In an interview with the DPWH, the budget involved in items such as new school building construction has been allocated to DPWH from 2013. The budget situation is identified by the 2013 Capital Outlays of DepEd in Table 2-4-1. (Capital outlay is reducing.)

#### 2-4-1-2 Budget Status

The number of students and budget of DepEd Leyte Division Office, Samar Division Office and Eastern Samar Division Office is shown in Table 2-4-1. The number of schools and students and amount of budgeting shown includes public elementary schools kindergartens and secondary schools.

The Personnel Services includes salaries of regular employees including teachers. Maintenance & Other Operating Expenses (MOOE) includes operation and maintenance cost of each school.

The budget for capital outlays has decreased because the budget for new construction has been allocated to DPWH since 2013. However, the total budget grew by 120 % in the 2011-2013 time period, while the growth in the number of students in the three provinces in 2011-2013 was 110%. This shows budget is being allocated for the development of the educational environment.

The allocation of MOOE of the average elementary school in Leyte with 250 students, 7 teachers and 7 classrooms is 150 thousand pesos. This is sometimes not sufficient, therefore schools request that the Local Government Unit (LGU) support the budget for school activities. Some of the LGU also send contract teachers to the schools. Activities that utilize the PTA (Parent Teacher Association) are also being carried out such as repairing the schools.

**Table 2-4-1 Budget Status of 3 Division Offices of DepEd (Target Area)**

Item	Year	Personnel Services (PhP)	Maintenance & Other Operating Expenses (PhP)	Capital Outlays (PhP)	Total (PhP)	Number of Students (PhP)	Number of Schools (PhP)
Division of Leyte	2011	3,427,345,955	289,412,513	185,772,945	3,902,531,412	409,885	1,462
	2012	3,948,733,821	348,940,221	162,403,241	4,460,077,283	414,123	1,475
	2013	4,474,687,192	389,286,833	86,101,712	4,950,075,737	461,025	1,476
Division of Eastern Samar	2011	1,536,674,745	153,927,753	143,016,506	1,833,619,004	196,052	949
	2012	1,657,477,439	171,566,784	89,578,192	1,918,622,415	194,947	971
	2013	1,737,434,939	181,504,198	43,600,435	1,962,539,572	200,553	973
Division of Eastern Samar	2011	1,430,471,189	127,427,238	132,298,184	1,690,196,612	113,217	526
	2012	1,562,556,085	128,740,072	113,490,048	1,804,786,205	112,175	528
	2013	1,757,364,006	162,646,084	42,003,600	1,962,013,690	130,670	528

The budget for capital outlays in Leyte Division Office is shown in Table 2-4-2. It shows public schools (kindergarten, primary school, secondary school) construction and repair in 2012.

**Table 2-4-2 Construction, Repair of School Building in DepEd Leyte Division (2012)**

Type	Budget (Thousand PhP)	Number of Project
Construction of School Buildings	81,075	42
Repair of School Buildings	19,525	21
Construction of Laboratory, Workshop Buildings	2,983	2
Construction of Toilets & Hand washing facilities	12,078	18
Repair, Rehabilitation of Gabaldon	9,446	7
Variety of Construction, Repair (School Building, Toilets, Hand washing facilities)	11,102	6
Repair of Division Offices	2960	1
Total	139,169	97

### **2-4-1-3 School Building Maintenance Capacity**

There is a system in which DepEd monitors the school facilities and allocates necessary budget to each school in the case of large-scale repair and also new construction and building expansion. The daily maintenance of school facilities and minor repairs are the responsibility of each school. There is technical assistance from DepEd Division Office, and a school can request a private construction company to make the repairs.

School construction, building extension and large-scale repairs are made by DPWH or DepEd, depending on the budget situation. There are two different school design standards, one for DPWH and one for DepEd. Which of the 2 standards is used depends on the implementing agency.

When DPWH is in charge of the construction, DepEd conducts monitoring and they should jointly implement the final inspection. However DepEd cannot carry out the inspections with DPWH, because of the lack of staffs. To carry out the maintenance including the repair, various information related to the plan and construction are important. Close cooperation between DPWH and DepEd is required.

### **2-4-1-4 Contents of Operation and Maintenance**

There is no need for special maintenance for the school buildings to be constructed under this project. Daily cleaning and checking the condition of the facility is important. Each school has carried out the regular management with LGU and PTA. Also, DepEd Division Office regularly monitors the situation, therefore, there is no problem maintaining the day-to-day management.

### **2-4-1-5 Current Status of School Operation and Maintenance**

The information regarding the plan and construction of the school buildings is important for carrying out the maintenance including repairs. DPWH is going to be mainly in charge of new construction of school buildings, therefore the close cooperation between DPWH and DepEd will be required more than now.

Additionally, there are 2 school building standards one each for DPWH and DepEd. It is recommended to provide a unified school building standard considering typhoon disaster prevention.

## 2-4-2 Reconstruction of Medical Facilities

### 2-4-2-1 Organization and Staffing for Operation and Maintenance

#### (1) Operation and Maintenance of Medical Facilities and Equipment in the Philippines

Operation and maintenance of Rural Health Unit (RHU) facilities (buildings) and medical equipment are carried out by the Local Government Unit (LGU). The Health section (City Health Office (CHO), Municipal Health Office (MHO)) of LGU determines the management policy for the RHU along with the policy for health and medical care that are set up by the Center for Health Development (CHD) and Provincial Health Office (PHO). For large-scale repair for the RHU, budget is requested from the CHD the same as new construction, building expansion and purchase of medical equipment.

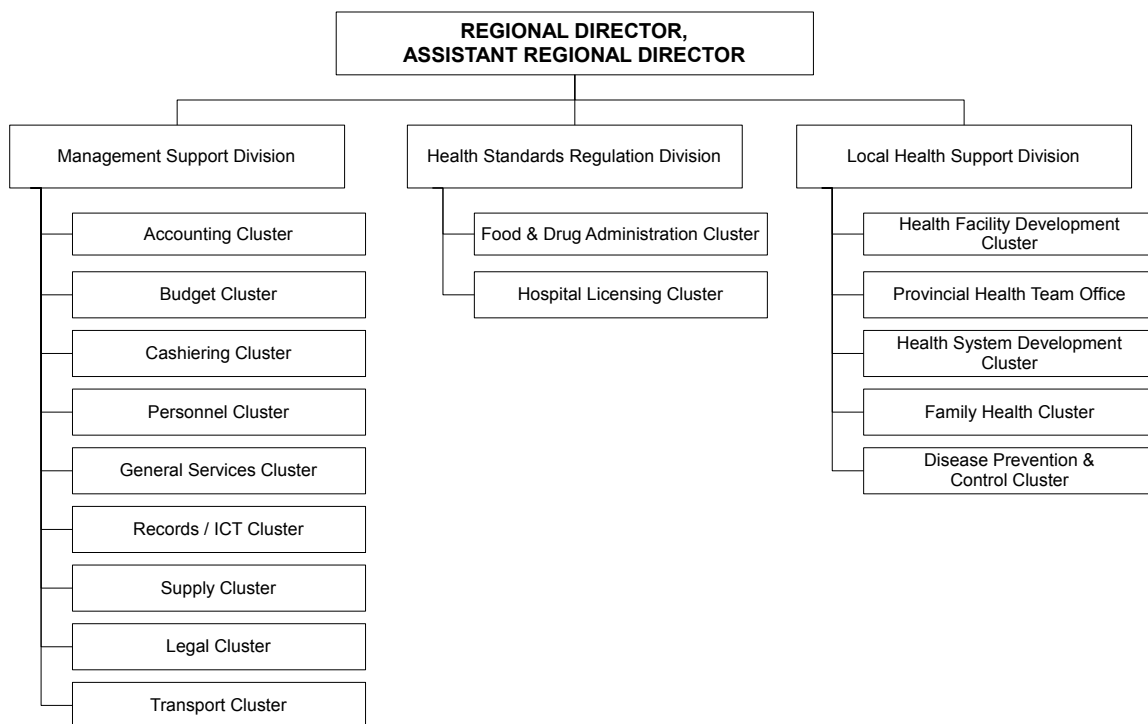
The Health Facility Development Cluster is the part of the CHD that is in charge of medical facilities and equipment in Eastern Visayas. The organization chart of CHD is shown in Figure 2-4-2. The organization chart and staffing of the Health Facility Development Cluster is shown in Figure 2-4-3.

Jurisdiction for operation and maintenance of health facilities (hospitals, RHU, etc.) is different in each area and Eastern Visayas Regional Medical Center (EVRMC) is carried out on their own with support at the national level.

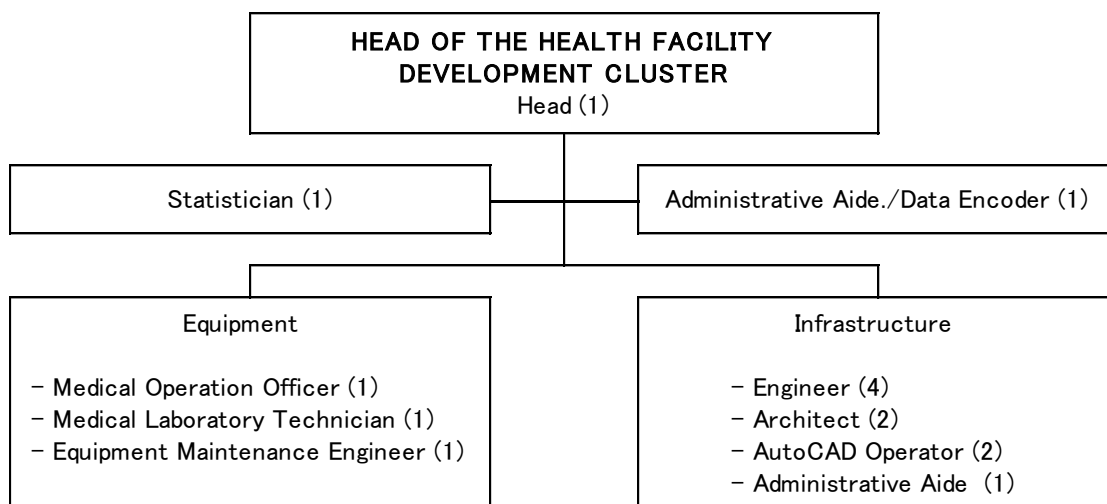
Jurisdiction of health facilities in the Philippines is shown in Table 2-4-3.

**Table 2-4-3 Jurisdiction of Medical Facilities**

	Facilities
National	Eastern Visayas Regional Medical Center
Province	Provincial Hospital, District Hospital
City, Municipality	Rural Health Unit (RHU), City Hospital
Barangay	Barangay Health Station (BHS), Barangay Health Centre (BHC)



**Figure 2-4-2 Organization Chart of the Center for Health Development (CHD)**



**Figure 2-4-3 Organization Chart and Staffing of the Health Facility Development Cluster of CHD**

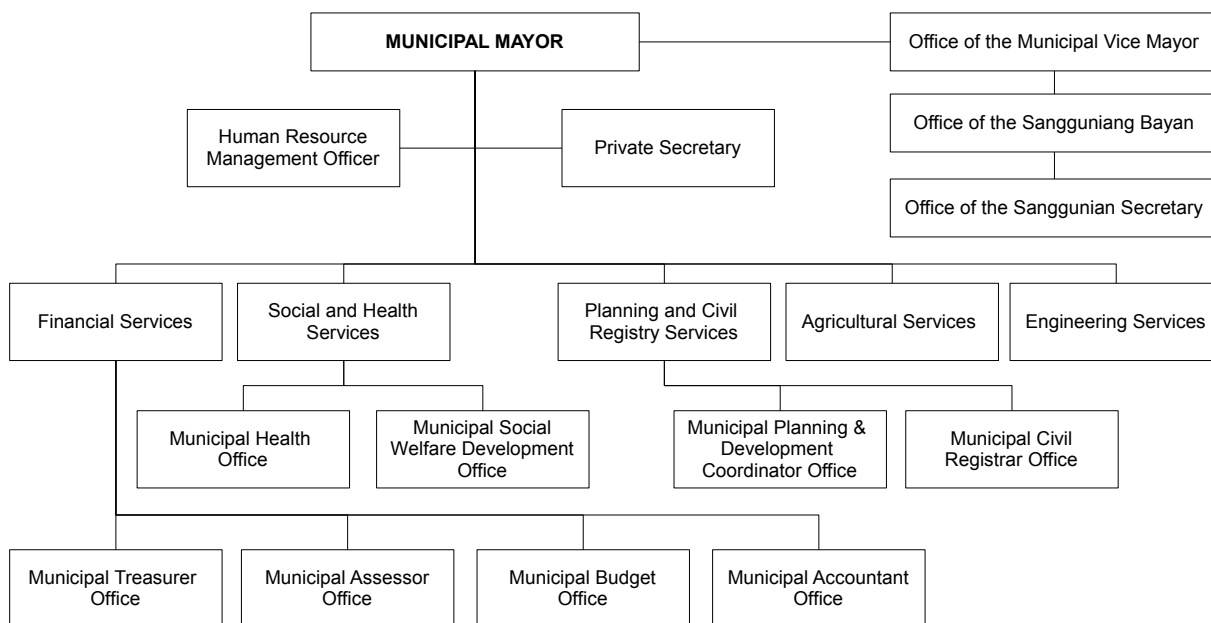
**(2) Maintenance of Target Health Facilities**

The RHU is a local health facility under each LGU and it conducts a wide range of health activities such as basic treatment (Level 1), maternal and child health, and public health activities. The LGU determines the management policy of the RHU and also takes care of the maintenance of the RHU with the technical support of PHO and CHD.

Daily maintenance of the facility is carried out by utility workers and the engineering section of LGU. The organization chart of the target LGU is shown in Figure 2-4-4 (Lawaan Municipality), Figure 2-4-5 (Malabut Municipality), Figure 2-4-6 (Dulag Municipality), and Figure 2-4-7 (Abuyog Municipality).

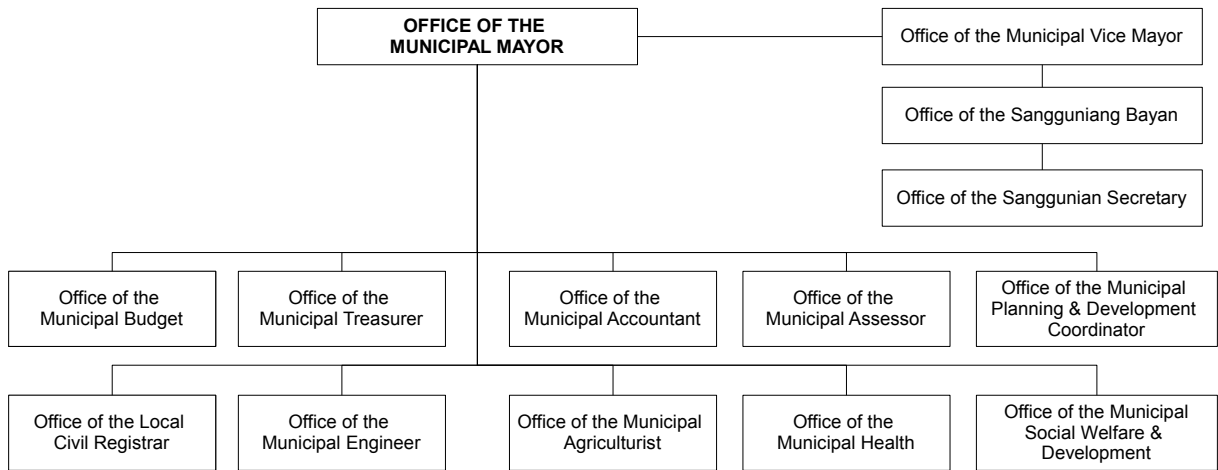
The staffing of the target RHU is shown in Table 2-4-4.

The LGU submits a budget request, based on the rough estimation scale to the CHD for large-scale repair, and also for the purchase of medical equipment. When the request for repair is approved, the Department of Public Works and Highways Regional Office (DPWH Regional Office) makes plan and estimation by discussing with the LGU. If the donor or LGU prepares plan and estimation, DPWH inspects the plan. Subsequently, the plan and estimation are inspected by the Health Facility Development Cluster of CHD to determine if the plan follows the DOH standards as a medical facility or not. DPWH undertakes the construction and CHD carries out monitoring during construction. There is also a joint final inspection of the building construction prior to completion. However, CHD cannot monitor all of the activities, and it may be inspected by either DPWH or CHD, because of the lack of staffs.

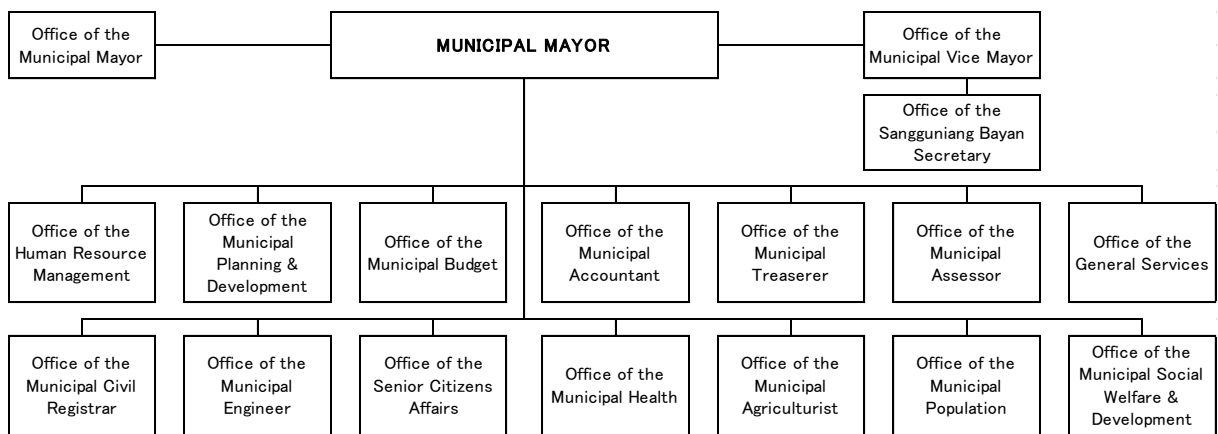


**Figure 2-4-4 Organization Chart of Lawaan Municipality**

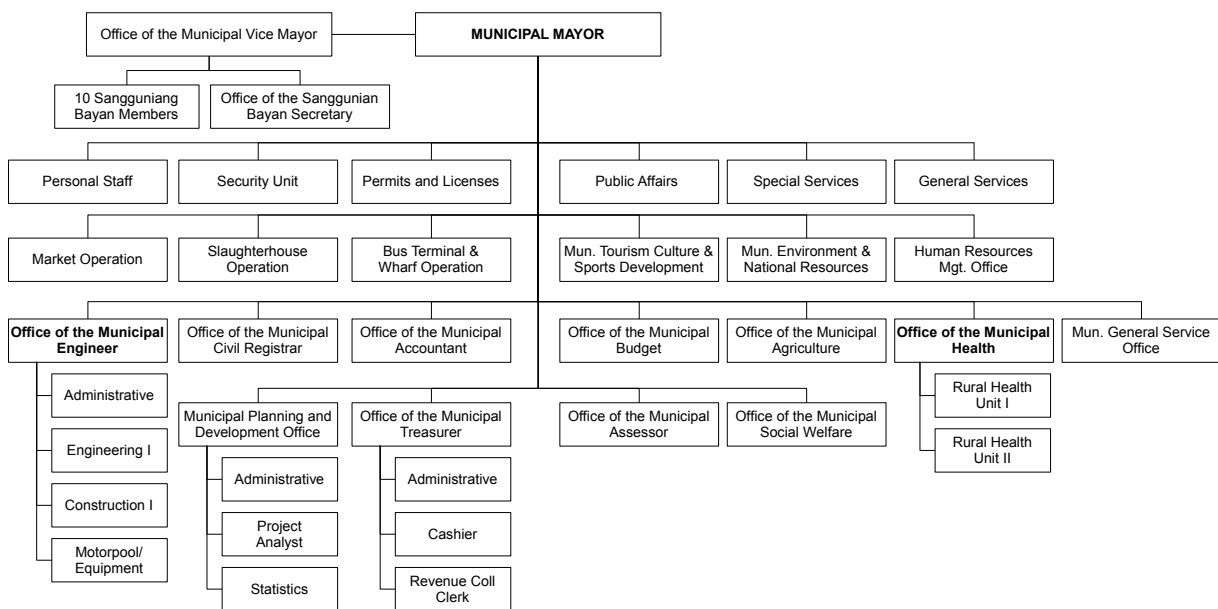




**Figure 2-4-5 Organization Chart of Marabut Municipality**



**Figure 2-4-6 Organization Chart of Dulag Municipality**



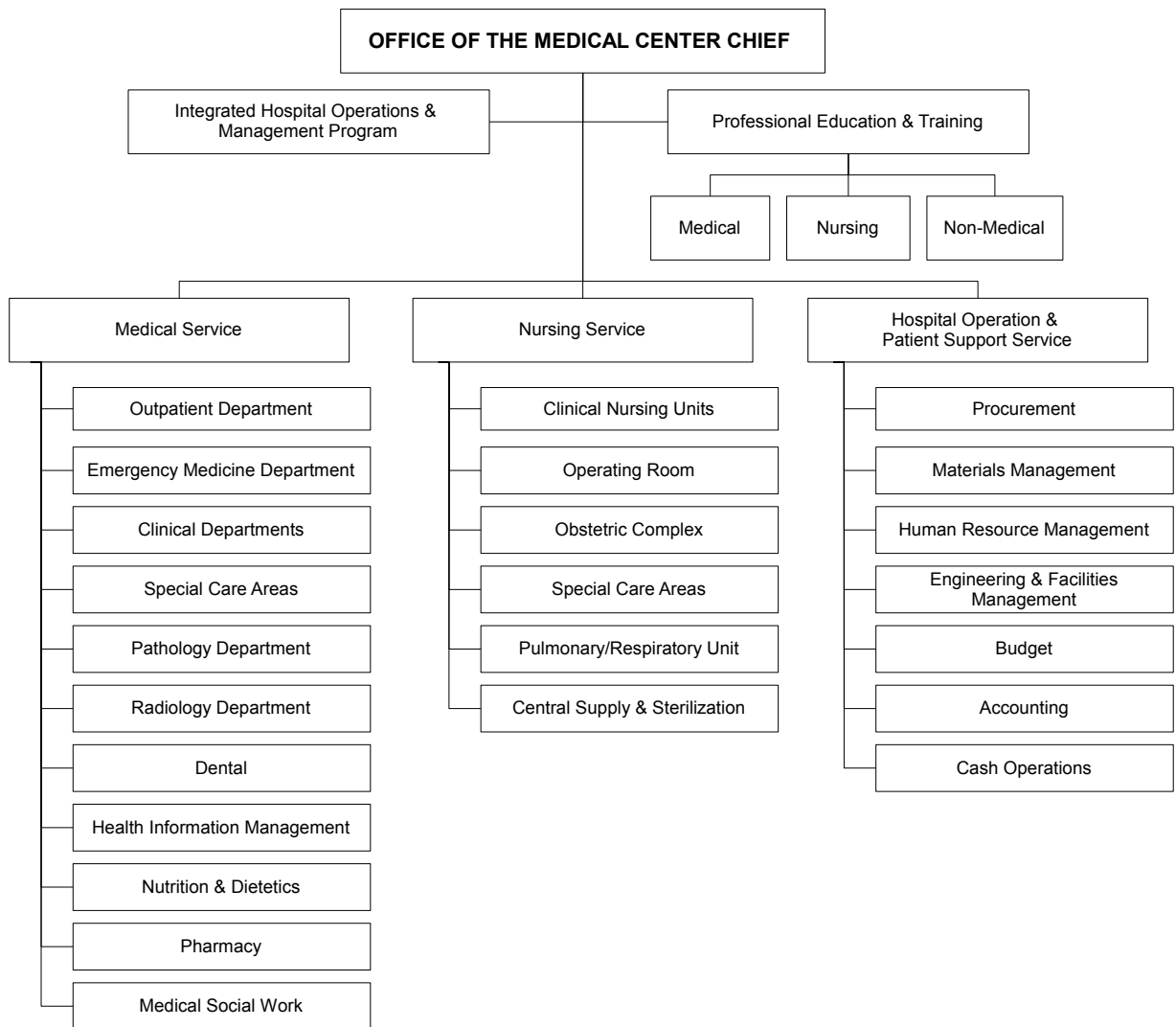
**Figure 2-4-7 Organization Chart of Abuyog Municipality**

**Table 2-4-4 Staffing of RHU**

	Municipal Health Officer (Dr.)	Dentist	Nurse	Midwife	Medical Technologist	Laboratory Technician	Sanitary Inspector	Driver	Others	Total
Lawaan	1	1 (visiting)	1	4	1	-	1	1	-	10
Marabut	1	1 (visiting)	1	8	1	-	1	1	1	15
Durag	1	1	2	7	1	-	1	2	9	25
Abuyog II	1	-	1	10	1	1	1	-	2	17

EVRMC is a level 3 hospital and receives patients from the RHU and hospitals as the central medical institutions in Eastern Visayas. Operation and maintenance are carried out on their own with support at the national level. Total number of employees as of March 2014 is 597 staffs of which regular employees is 365 staffs. There are utility workers responsible for daily maintenance, but also there is the Engineering and Facilities Management section to take care of buildings and medical equipment maintenance. The section consist of 1 civil engineer, 1 CAD operator, 1 electrical engineer, 1 medical engineer, 1 mechanical engineer, 1 chemical engineer, 4 carpenters, 2 plumbers, 2 electricians and the other 16 staffs.

The organization chart of EVRMC is shown in Figure 2-4-8. There is a plan to establish the "Finance Service" section to independently manage the Budget, Accounting, and Cash Operations. Authorized bed capacity of the current hospital is 275 beds. However the organizational structure will be the same up to 500 beds, even though the number of staff will be increased.



**Figure 2-4-8 Organization Chart of Eastern Visayas Regional Medical Center (EVRMC)**

**(3) Maintenance of Target Medical Equipment**

Daily maintenance of medical equipment is carried out by the RHU staff that are in charge of daily operation of the equipment. Simple repairs are made by the utility workers. The technician of the Health Facility Development Cluster also repairs simple equipment such as microscopes.

Some of the equipment is difficult to repair and LGU purchases some equipment with the budget of LGU. There is a private company dealing with various medical equipment in Tacloban. All of the target LGUs utilize the company. The LGU can also apply to CHD, however it takes time. Therefore LGUs purchase simple equipment. Daily maintenance of the ambulance is carried out by the LGU driver. LGU employs a private repair shop when technical repair is necessary. The main purpose of the transportation is to connect to obstetrics. Patients are transported to EVRMC, LPH, private hospitals, etc.

Daily maintenance of medical equipment in EVRMC is carried out by the EVRMC staff that are in charge of daily operation, and also staffs of Engineering and Facilities Management section repair them. The repair of sophisticated medical equipment is requested to Hospital Maintenance Service

(HMS) which is installed in the CHD for Central Visayas region. The HMS is in charge of medical equipment repair support for the areas of 3 CHD (Eastern Visayas, Western Visayas and Central Visayas Region). HMS provides several levels of short-term training courses for the maintenance of medical equipment. Engineers of EVRMC have taken the training already. EVRMC also requests repair directly to the manufacturer of the sophisticated equipment.

#### **2-4-2-2 Budget Status**

The budget related to large-scale repair of medical facilities, new construction, building extension, and purchase of medical equipment is determined at the Health Facility Enhancement Meeting, which is coordinated by the CHD with the attendance of representatives of public hospitals, PHO, and LGU/CHO/MHO in Eastern Visayas, at the beginning of a new fiscal year. At the meeting the Annual Operation Plan is prepared based on the applications from the representatives, and it is submitted to the DOH.

The budget status of CHD is shown in Table 2-4-5. The budget of the Health Facility Development Cluster, which coordinates the meeting mentioned above, is included in the Local Health Support Division. The budget for health project activities is allocated separately for the various programs.

The budget status of the Health Facility Enhancement Program is shown in Table 2-4-6. As a special budget for disaster response, there are an additional 200 million pesos for facilities and 150 million pesos for equipment. The most of the additional budget is supported by donors, therefore the total amount is not finally determined yet.

CHD can monitor the condition of health facilities in their jurisdictional area and appropriate the budget to the required place according to the priority of the area, through the Health Facility Enhancement Meeting.

**Table 2-4-5 Budget Status of CHD**

Year	Division	Personal Services (PhP)	Maintenance & Other Operating Expenses (PhP)	Total (PhP)
2013	Management Support Division	34,453,000	10,492,000	44,945,000
	Health Standards Regulation Division	2,304,000	3,926,000	6,230,000
	Local Health Support Division	74,334,000	157,460,000	231,794,000
	Total	111,091,000	171,878,000	282,969,000
2014	Management Support Division	54,709,000	10,492,000	65,201,000
	Health Standards Regulation Division	1,920,000	4,748,000	6,668,000
	Local Health Support Division	71,138,000	157,460,000	228,598,000
	Total	127,767,000	172,700,000	300,467,000

**Table 2-4-6 Budget Status of Health Facility Enhancement Program**

Year	Province	Infrastructure (Thousand PhP)	Equipment (Thousand PhP)	Total (Thousand PhP)
2012	Leyte	66,330	4,650	70,980
	Samar	19,000	15,000	34,000
	Eastern Samar	68,500	41,543	110,043
	Regional VIII	254,136	89,443	343,579
2013	Leyte	156,450	n/a	n/a
	Samar	34,100	n/a	n/a
	Eastern Samar	7,200	n/a	n/a
	Regional VIII	244,700	202,740	447,440
2014	Leyte	19,000	17,547	36,547
	Samar	11,800	10,077	21,877
	Eastern Samar	23,019	5,022	28,041
	Regional VIII	179,842	41,998	221,840

The budget status of EVRMC is shown in Table 2-4-7. The amount is based on an interview survey, because the official records at the hospital were damaged by the typhoon. Therefore the amount is rough. Remuneration for Medical Care is increasing as the health care system has become more popular. At least 25% of the remuneration is utilized for facility development of EVRMC, and it is also utilized to cover the cost of office supplies, pharmaceuticals, spare parts for medical equipment and temporary staff employment.

**Table 2-4-7 Budget Status of EVRMC**

Year	Personal Services (Thousand PhP)	Maintenance & Other Operating Expenses (Thousand PhP)	Others (Thousand PhP)	Total (Thousand PhP)	Remuneration for Medical Care (Thousand PhP)
2011	125,000	43,000	25,000	193,000	54,000
2012	157,000	46,000	25,000	228,000	60,000
2013	161,547	51,037	102,190	314,774	92,000

The budget status of the target LGU/RHU is shown in Table 2-4-8. The budget of the RHU is included in the health section. The special budget from the Health Facility Enhancement Meeting is not included. The budget for operation and maintenance is included in Maintenance & Other Operating Expenses (MOOE), additionally there is also budget for the health sector in budget of Others as one of the special purpose appropriations.

**Table 2-4-8 Budget Status of Municipality and Health Section**

Lawaan	Year	Personal Services (PhP)	Maintenance & Other Operating Expenses (PhP)	Capital Outlays (PhP)	Others (PhP)	Total (PhP)
Municipality Total	2011	19,757,731	6,010,728	-	11,240,205	37,008,664
	2012	20,417,765	7,024,778	105,000	11,576,924	39,124,467
	2013	22,503,399	8,255,600	62,000	12,889,374	43,710,373
Health Section	2011	2,880,908	627,585	-	-	3,508,493
	2012	3,245,629	662,585	-	-	3,908,214
	2013	3,589,710	779,759	-	-	4,369,469
<b>Marabut</b>						
Municipality Total	2012	20,692,529	9,211,356	300,000	10,353,962	40,557,846
	2013	22,870,748	10,387,374	300,000	11,791,375	45,349,497
	2014	25,129,629	11,308,425	350,000	13,468,018	50,256,072
Health Section	2012	3,871,600	458,781	-	-	4,330,381
	2013	4,243,986	282,731	-	-	4,526,717
	2014	4,578,448	1,373,120	-	-	5,951,568
<b>Durag</b>						
Municipality Total	2011	32,220,850	13,442,680	751,022	16,753,090	63,167,641
	2012	35,067,943	12,534,245	0	22,792,084	70,394,272
	2013	41,653,064	12,144,485	100,000	23,949,087	77,846,636
Health Section	2011	4,776,868	387,033	-	-	5,163,901
	2012	4,794,670	512,500	-	-	5,307,170
	2013	5,406,672	417,000	-	-	5,823,672
<b>Abuyogu</b>						
Municipality Total	2012	61,547,892	27,576,404	3,145,980	35,822,541	128,092,817
	2013	64,101,883	34,345,900	876,691	48,892,158	148,216,632
	2014	69,853,133	35,497,900	2,178,300	53,429,209	160,958,542
Health Section	2012	8,577,298	2,504,778	148,583	-	11,230,659
	2013	8,446,695	3,642,400	50,000	-	12,139,095
	2014	8,776,637	3,712,400	100,000	-	12,589,037

**2-4-2-3 Maintenance Capacity****(1) Maintenance Capacity of Health Facilities**

The engineering section of the LGU is responsible for maintenance of the RHU facility. Each LGU employs at least one engineer and utility workers are also employed to undertake daily maintenance. Technical assistance specializing in the RHU is supported by CHD. There is an appropriate system. Daily maintenance of EVRMC facilities is carried out by utility workers. Repairs are carried out by the Engineering and Facilities Management section. It is determined that there is no problem in the daily building maintenance.

However, if the new facilities such as EV are placed in the new construction building, the engineer needs to learn the maintenance skills. Additionally, by the engineers joining the construction, the engineer's technical capacity is going to be developed and can get the knowledge of the new building maintenance.

## **(2) Maintenance Capacity of Medical Equipment**

The medical equipment in RHU is not complicated and the maintenance is carried out by the RHU staffs. The function of the ambulance is to concentrate on transporting patients and it is operated by an LGU driver. Therefore, it is determined that there is no problem with the daily maintenance.

### **2-4-2-4 Contents of Operation and Maintenance**

#### **(1) Contents of Operation and Maintenance of Health Facilities**

In the RHU buildings to be constructed under this project, there is no need for special maintenance. Daily cleaning and checking the condition of the facility is important. Each RHU has carried out the regular management with PHO, CHD. Therefore, it is determined that there is no problem with the daily maintenance.

#### **(2) Contents of Operation and Maintenance of Medical Equipment**

Daily maintenance and simple repairs are carried out by the RHU staffs. Procurement equipment including the ambulance are the same specification as those currently being used. Therefore, it is determined that there is no problem with the daily maintenance.

### **2-4-2-5 Current Status of Operation and Maintenance**

#### **(1) Current Status of Health Facility Operation and Maintenance**

Daily maintenance of RHU is no problem because it is conducted by LGU. However, the new buildings have been planned based on disaster prevention with new construction standards. Therefore, the engineer should join the construction work with DPWH to build up his technical capacity.

EVRMC has an Engineering and Facilities Management section, however some of the engineers are contract staffs. Experienced workers are important in the long-term maintenance . Making the position stable should be considered in order to maintain a good condition for a long time.

Additionally, it is necessary to learn the maintenance of new facilities. Engineers should be involved from the time of construction, then they will be able to get technical experience and knowledge of new buildings to make effective and efficient maintenance implementation.

#### **(2) Current Status of Medical Equipment Operation and Maintenance**

There is no problem with daily maintenance of medical equipment in RHU. There is no sophisticated equipment in the RHU, but the status of HMS could not be confirmed. However, HMS provides basic maintenance training courses for those that work with medical equipment. Joining the training course is suggested. When ambulance is delivered, initial description of it from the manufacturer should be required for the operation and maintenance.

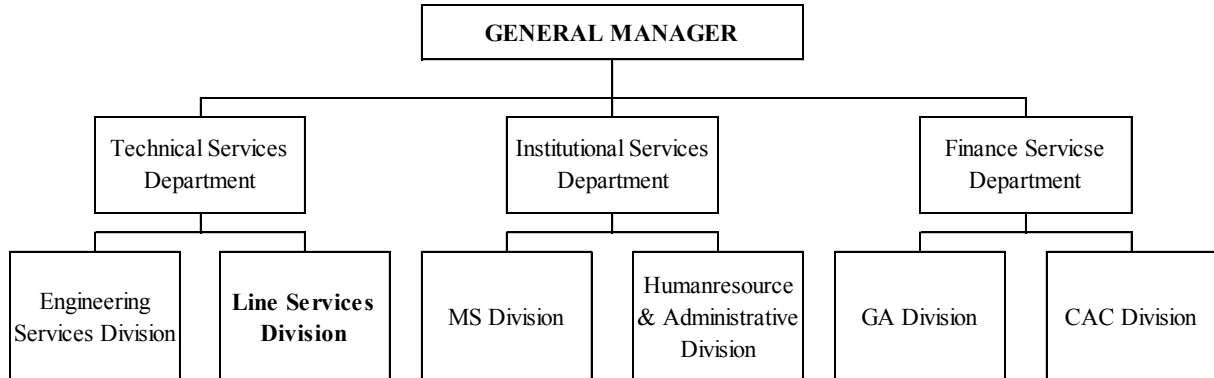
### 2-4-3 Rehabilitation of Electricity Equipment

#### 2-4-3-1 Organization for O&M and Allocation of Human Resources

The operation and maintenance of power distribution systems in the Philippines is carried out by each EC under the supervision of NEA. The heavy equipment procured in this project will be provided to each EC and they shall be maintained by each EC. The allocation of human resources in each EC targeted for the provision of heavy equipment procured in this project is shown in Table 2-4-9. Depending on the EC, the department in charge of maintenance and administration for heavy equipment differs. However, there is no big difference among ECs in terms of basic organization. For reference, the organization chart for Leyeco II, which supplies the power for most households in targeted ECs, is shown in Figure 2-4-9.

**Table 2-4-9 Allocation of Personnel Related to O&M for Heavy Equipment in EC**

EC	Number of Employees	Maintenance and Administrative Department	Number of Employees for Maintenance and Administrative Department	Number of Operators for Heavy Equipment	Number of Mechanics
Dorelco	119	Vehicle Maintenance Division	20	10	2
Leyeco II	134	Line Services Division	62	15	2
Samelco II	136	General Services Section	13	10	3
Esamelco	146	General Services Section	14	2 (only for BTwB)	3



**Figure 2-4-9 Organization Chart for Leyeco II**

#### 2-4-3-2 Budget in Each EC

Each EC is operated based on its own budget and is a non-profit and public electric cooperative. The financial statement for each EC is shown in Table 2-4-10. Also, the budget including repair and maintenance cost is shown in Table 2-4-11.



**Table 2-4-10 Financial Statement for Targeted ECs**

	Don Orestes Romalko Electric Cooperative, Inc. (Dorelco)			Leyte II Electric Cooperative, Inc. (Leyeco II)			Samur II Electric Cooperative, Inc. (Sameco II)			Eastern Samar Electric Cooperative, Inc. (Esamelco)		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
<b>Revenues</b>												
Sale of energy												
Residential sales	204,672,799	220,077,537	248,546,742	430,139,745	481,151,133	584,371,919	222,609,175	224,003,132	243,315,719	251,393,910	257,000,891	297,366,836
Industrial sales	75,305,337	50,412,382	59,878,200	402,505,395	448,616,969	542,206,234	10,765,999	15,824,131	15,741,558	12,939,433	14,104,056	11,941,058
Commercial sales	43,350,660	50,483,365	55,951,366	168,221,626	181,157,725	210,232,850	63,369,866	61,047,163	76,138,578	39,278,837	38,283,437	43,759,429
Sales to public buildings and facilities	16,725,785	19,304,389	22,942,553	81,561,684	85,099,033	103,824,622	30,614,899	29,719,197	31,780,574	25,040,679	25,600,454	31,081,585
Sales to public and private security lighting	4,854,285	5,735,326	6,231,944	23,798,733	23,489,940	27,407,304	12,569,513	11,485,625	10,705,707	10,512,434	11,091,364	12,081,746
Other revenues	34,938,013	32,534,327	47,745,478	20,697,074	26,218,347	31,007,266	11,183,078	10,539,999	10,924,527	7,204,825	7,768,996	15,744,253
<b>Total Revenues</b>	<b>379,846,889</b>	<b>378,547,326</b>	<b>441,296,283</b>	<b>1,126,924,257</b>	<b>1,245,703,147</b>	<b>1,499,050,285</b>	<b>351,112,130</b>	<b>352,987,247</b>	<b>388,606,663</b>	<b>346,370,118</b>	<b>353,849,198</b>	<b>411,944,897</b>
<b>Direct Costs</b>												
Cost of power	284,871,078	288,283,409	361,826,366	948,193,184	1,057,129,620	1,293,954,267	260,452,764	261,897,780	300,554,265	262,104,605	273,080,424	315,519,179
Distribution	23,461,143	25,582,241	26,647,139	44,426,267	57,352,015	54,724,548	24,499,190	29,153,474	27,236,652	23,088,314	25,846,975	25,537,242
Consumers' accounts	15,280,291	16,226,916	18,779,856	30,979,525	30,876,135	33,402,477	18,730,542	20,555,472	22,369,804	13,336,777	15,628,260	16,258,421
Depreciation	4,756,474	5,436,857	4,875,477	29,750,277	32,548,202	34,433,884	11,260,367	12,138,336	12,966,521	10,104,519	12,482,399	13,408,460
<b>Total Direct Costs</b>	<b>328,368,986</b>	<b>335,529,423</b>	<b>412,128,838</b>	<b>1,053,352,253</b>	<b>1,177,906,172</b>	<b>1,416,515,476</b>	<b>314,902,863</b>	<b>322,745,062</b>	<b>363,127,242</b>	<b>308,714,215</b>	<b>327,038,058</b>	<b>370,543,302</b>
<b>Gross Profit</b>	<b>51,477,903</b>	<b>43,017,903</b>	<b>29,167,445</b>	<b>73,572,005</b>	<b>67,796,975</b>	<b>82,534,809</b>	<b>36,209,266</b>	<b>30,242,185</b>	<b>25,479,421</b>	<b>37,655,903</b>	<b>26,811,140</b>	<b>41,401,595</b>
<b>Other Operating Expense(Income)</b>												
Administrative and general	33,602,672	40,613,143	43,737,209	61,340,077	57,066,578	79,994,661	24,791,080	26,361,249	35,174,569	44,896,655	43,672,307	41,449,788
Depreciation	3,346,154	4,557,124	2,882,772	7,862,960	6,944,655	0	—	—	—	—	—	—
Finance charges	5,911,626	5,327,150	4,211,212	209,044	37,866	37,866	1,056,477	—	221,214	191,853	1,890,101	2,173,675
Others, net	-7,263,156	-4,962,579	-4,410,611	-4,276,574	2,302,872	-1,167,987	—	—	—	-8,052,888	-7,661,074	-6,033,010
<b>Total Other Operating Expenses</b>	<b>35,616,696</b>	<b>45,534,838</b>	<b>46,420,712</b>	<b>69,780,201</b>	<b>67,270,276</b>	<b>85,370,780</b>	<b>25,847,557</b>	<b>26,582,463</b>	<b>35,366,422</b>	<b>38,733,868</b>	<b>38,184,908</b>	<b>41,115,410</b>
<b>Net Profit (Loss) for the Year</b>	<b>15,861,207</b>	<b>-2,516,935</b>	<b>-17,253,267</b>	<b>3,791,804</b>	<b>526,699</b>	<b>-2,835,921</b>	<b>10,361,709</b>	<b>3,659,722</b>	<b>-9,887,001</b>	<b>-1,077,965</b>	<b>-11,373,768</b>	<b>286,176</b>
<b>Assets</b>												
Total Non-Current Assets	172,719,306	199,939,201	251,566,908	306,311,242	328,384,834	311,795,171	362,874,111	378,204,624	404,032,389	400,925,741	457,804,776	550,980,621
Administrative and general	104,560,301	142,342,988	190,087,070	316,423,755	367,456,481	362,284,578	120,984,069	155,422,578	152,088,016	176,847,284	180,299,531	183,665,781
<b>Total Current Assets</b>	<b>277,279,607</b>	<b>342,281,599</b>	<b>401,653,978</b>	<b>622,732,997</b>	<b>695,841,315</b>	<b>674,079,749</b>	<b>483,458,180</b>	<b>533,627,202</b>	<b>556,070,405</b>	<b>577,773,025</b>	<b>607,014,307</b>	<b>714,586,402</b>
<b>Member's Equity and Liabilities</b>												
Total Member's Equity	63,539,755	78,279,375	61,620,831	427,366,929	452,883,979	425,287,303	371,367,471	411,302,980	375,287,823	381,570,767	417,272,718	506,936,802
Total Non-current Liabilities	87,577,402	80,783,376	74,865,417	84,055,351	87,374,982	91,612,331	12,347,079	7,912,000	58,489,756	43,215,100	39,441,870	114,919,914
<b>Total Current Liabilities</b>	<b>126,162,470</b>	<b>183,227,848</b>	<b>265,167,790</b>	<b>111,308,717</b>	<b>157,133,354</b>	<b>157,179,715</b>	<b>99,743,630</b>	<b>114,412,132</b>	<b>121,832,826</b>	<b>152,987,555</b>	<b>156,299,719</b>	<b>92,729,608</b>
<b>Total Member's Equity And Liabilities</b>	<b>277,279,607</b>	<b>342,281,599</b>	<b>401,653,978</b>	<b>622,732,997</b>	<b>695,841,315</b>	<b>674,079,749</b>	<b>483,458,180</b>	<b>533,627,202</b>	<b>556,070,405</b>	<b>577,773,025</b>	<b>607,014,307</b>	<b>714,586,402</b>
<b>Maximum Peak Demand (kW)</b>	12,230	11,983	12,421	38,716	39,676	40,112	10,695	11,787	12,187	11,933	13,210	13,280
<b>kWh Sold (kWh)</b>	80,124,902	47,148,486	51,203,759	182,622,658	187,078,306	193,295,183	46,432,988	45,645,409	49,101,984	44,182,002	45,021,598	49,906,780

**Table 2-4-11 Budget Status for Each EC in 2012**

Unit : Thousand Php

EC	Labor Cost	Repair and Maintenance Cost	Others	Total
Dorelco	24,712,832	2,611,685	49,419,020	76,743,536
Leyeco II	53,127,745	2,884,364	81,081,993	137,094,102
Sameco II	36,727,075	2,224,731	39,787,240	78,739,046
Esamelco	38,011,028	2,263,475	38,387,982	78,662,486

**2-4-3-3 Securing of Human Resources for O&M for Heavy Equipment**

The procured heavy equipment requires 1 operator who can manipulate and drive it, and 2 high lift workers per 1 unit. According to Table 2-4-9, in Doelco, Leyeco II, and Sameco II, there are more operators than procured heavy equipment. Accordingly, there is no concern in terms of human resources. As Esamelco doesn't have a boom truck with digger, they at least need 2 operators who can make use of the pole erection function and 1 mechanic who can conduct its maintenance work. Regarding the mechanics, all ECs except for Esamelco have two mechanics who are engaged in maintenance work for heavy equipment. Accordingly, O&M under the current structure can be implemented without problems.

**2-4-3-4 Education and Training of Human Resources**

As shown in 2-2-3-3(7) "Training Plan for Initial Operation", O&M can be carried out without problems because the heavy equipment that was used before the devastation was equivalent to the procured equipment and O&M has been and will be implemented sufficiently as long as the training for O&M is provided by the engineer from the manufacturer. As a result of the training, mechanics can acquire the knowledge and skill required for O&M and it enables the Filipino side to sustainably conduct educational training on their own.

#### **2-4-3-5 Technical Capability for O&M for Heavy Equipment and Owned Maintenance Tools**

Each EC, which is targeted for the provision of heavy equipment in this project, has facilities and equipment stock space adjacent to its main office and the maintenance work for heavy equipment such as oil replacement work and periodic inspections can be conducted there. Tools necessary for maintenance work are prepared and there is no concern about the O&M environment. However, since Esamelco doesn't own a boom truck with digger, they need to acquire techniques required for maintenance work for a boom truck with digger through supplementary training regarding the inspection and repair methods in preparation for the provision of a boom truck with digger.

#### **2-4-3-6 Contents of O&M Work**

In the maintenance work for heavy equipment, daily cleaning is conducted and an oil change is implemented every 3 months. Furthermore, periodic inspection is implemented by mechanics.

#### **2-4-3-7 Consideration on Current O&M Work**

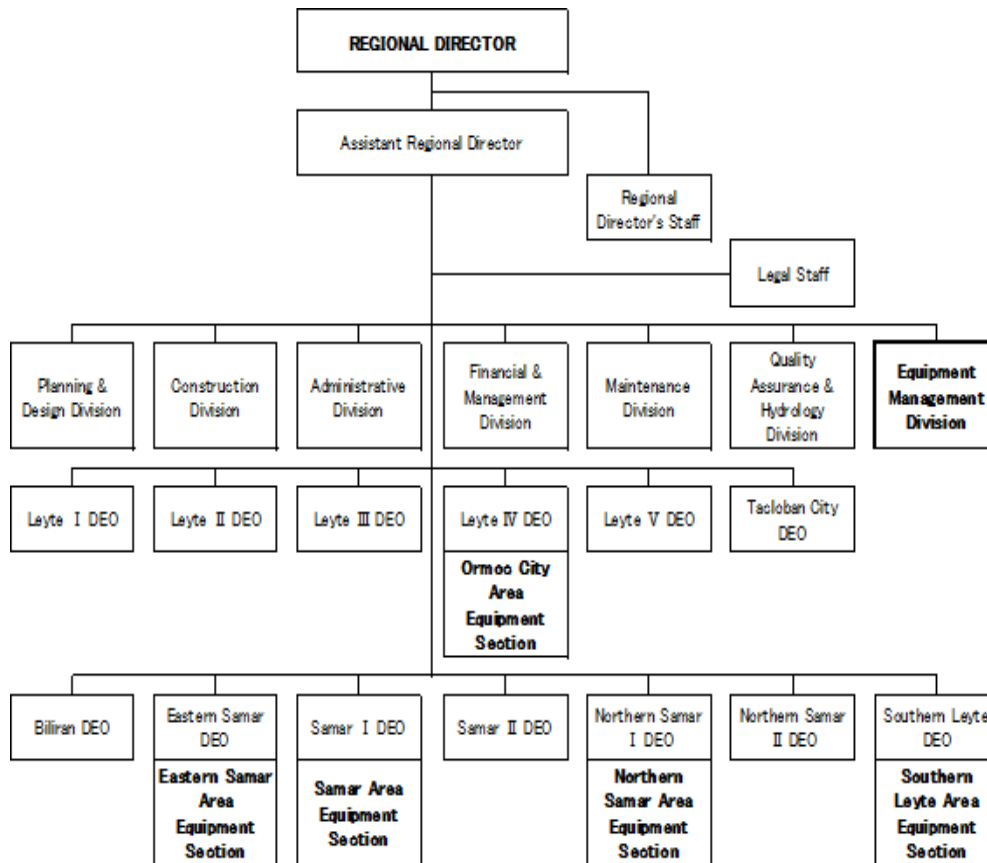
There seems to be no concerns regarding retaining operators and mechanics, and acquisition of O&M technique for the boom truck with digger mentioned in 2-4-3-3 and 2-4-3-5.

### **2-4-4 Recovery of Construction Equipment**

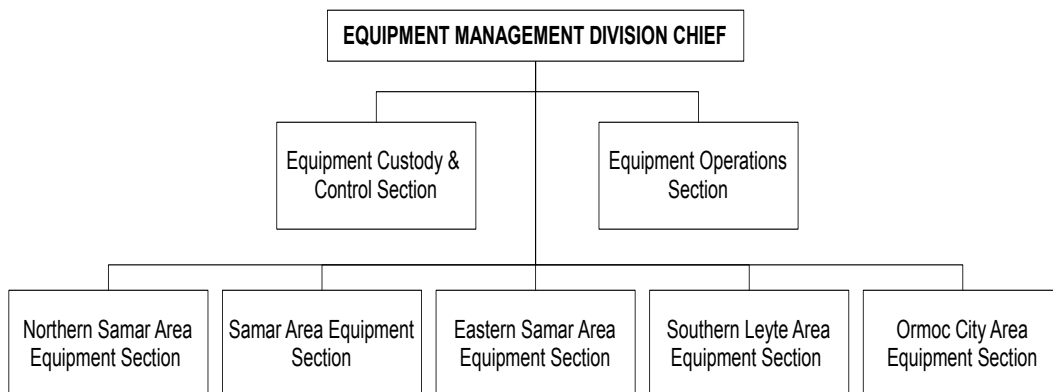
#### **2-4-4-1 Organization and Staffing for Operation & Maintenance**

##### **(1) Organization for Operation & Maintenance for Equipment**

The Equipment Management Division of DPWH Region VIII office shall be responsible for the operation and maintenance for all equipment owned by DPWH Region VIII. The following figure shows the organization of DPWH Region VIII as well as the Equipment Management Division (EDM). Number of personnel of EDM is 107 persons in total.



**Figure 2-4-10 Organization Chart of DPWH Region VIII**



**Figure 2-4-11 Organization Chart of EMD**

**(2) Organization and Staffing**

DPWH Region-VIII office is currently managing 13 district offices in Leyte Island and Samar Island. Those district offices are responsible for areal emergency activity at the time of disaster. The equipment management division, which is a sub-division of DPWH Region-VIII office, is responsible for operation and maintenance of all construction equipment owned by DPWH Region-VIII.

The equipment management division has 5 areal storage yards in Region-VIII and dispatches the equipment as needed to those storage yards from the main storage yards in Palo.

Basically, employees of each storage yard should consist of 1 Engineer, 3 Mechanics, 2 Operators, 1 Automotive Equipment Inspector, 1 Electrician and 1 Welder.

**Table 2-4-12 Management Department in Charge of Providing Equipment**

	Equipment Storage yard	Number (person)
	Equipment Management Division	37
1	Catarman, Northern Samar	10
2	Catbalogan City, Western Samar	16
3	Borongan City, Eastern Samar	14
4	Maasin City, Southern Leyte	14
5	Ormoc City, Leyte	16
	Total	107

※There is 7 vacancies

Also, the employees for the Equipment Management Division at Palo storage yards are shown in the table below.

**Table 2-4-13 Number of Employees at Palo Storage Yards**

Job Description	Number (person)	Remarks
Engineer	6	
Mechanic	11	
Operator	2	
Welder	2	
Metal Worker	2	
Plumber	1	
Store Keeper	3	
Automotive Equipment Inspector	2	
Human Resource Management Assistant	1	
Administration	3	
Supply Officer	1	
Disbursing Officer	1	
Nurse	1	
Utility Worker	1	
Total	37	

※There is 1 vacancy.

#### 2-4-4-2 Budget Status

The following table shows the budget status of EMD. It is tentative since parts of the official monetary data/record have been lost in Typhoon Yolanda. According to the information obtained, the organization of EMD has been restructured in 2011 and many staffs have been retired up to 2012.

Therefore, expenses for retirement and so on in 2012 have increased.

Furthermore, the maintenance cost has increased since many pieces of equipment, which are quite aged and almost at the limit of their life-times, were intensively repaired and maintained.

As the result of those tentative increases in 2012, the necessary budget in 2013 has been reduced. Budget for 2014 is still under consideration in the central government. It will be allocated sufficiently based on the requirements of EMD like that of 2012.

**Table 2-4-14 Budget Status of EMD (Equipment Management Division)**

Currency: peso

Year	Employment Cost	O & M Cost	Capital Outlay Expenses	Total
2011	57,778,275	2,806,203	36,337,039	96,921,517
2012	66,377,781	5,756,224	17,480,431	89,614,436
2013	40,397,344	3,847,152	13,426,606	57,671,102

### 2-4-4-3 Maintenance Capacity

#### (1) Maintenance for Construction Equipment

Even after retirement age, the experienced and skilled engineers still continue to work for EMD. Organization of EMD is, therefore, still adequate to take an immediate action at the time of emergency. Accordingly, it is judged that the current organization is sufficient for the operation and maintenance works on the existing equipment.

On the other hand, it is reported that some equipment storage yards still lack engineers. Those situations should be improved as soon as practically possible.

#### (2) Number of Owned Equipment

The following equipment in the table below is property of DPWH Region-VIII.

**Table 2-4-15 Construction Equipment List that belongs to DPWH**

No.	Equipment Type	Specification	Current Number of Units
1	Bulldozer	265 hp	0
2	Crane	25 ton	1
3	Backhoe(Excavtor)	0.6 m3	1
4	Pay Loader	1.5 m3	5
5	Road Grader	140 hp	1
6	Dump Trucks	6-8 m3, 6 wheeler	10
7	Trailer	-	0
8	Chain Saw	24" & 36 "	3
9	Generator Set *	5 kva-30 kva	154
10	Backhoe/Loader	(Hyundai)	0
11	Submersible Pump	-	0
12	Water Pump	-	2
13	Service Car	-	15
14	Shuttle Bus	-	1
Total Number			193

\*Note: Most of generator set is used for office (emergency) power supply

#### **2-4-4-4 Contents of Operation & Maintenance**

Operation and maintenance works for construction equipment are the daily checkup, regular checkup, annual checkup and so on. Additionally, emergency rescue activity and equipment support for local government (with operator) based upon their request.

#### **2-4-4-5 Current Status of Operation & Maintenance**

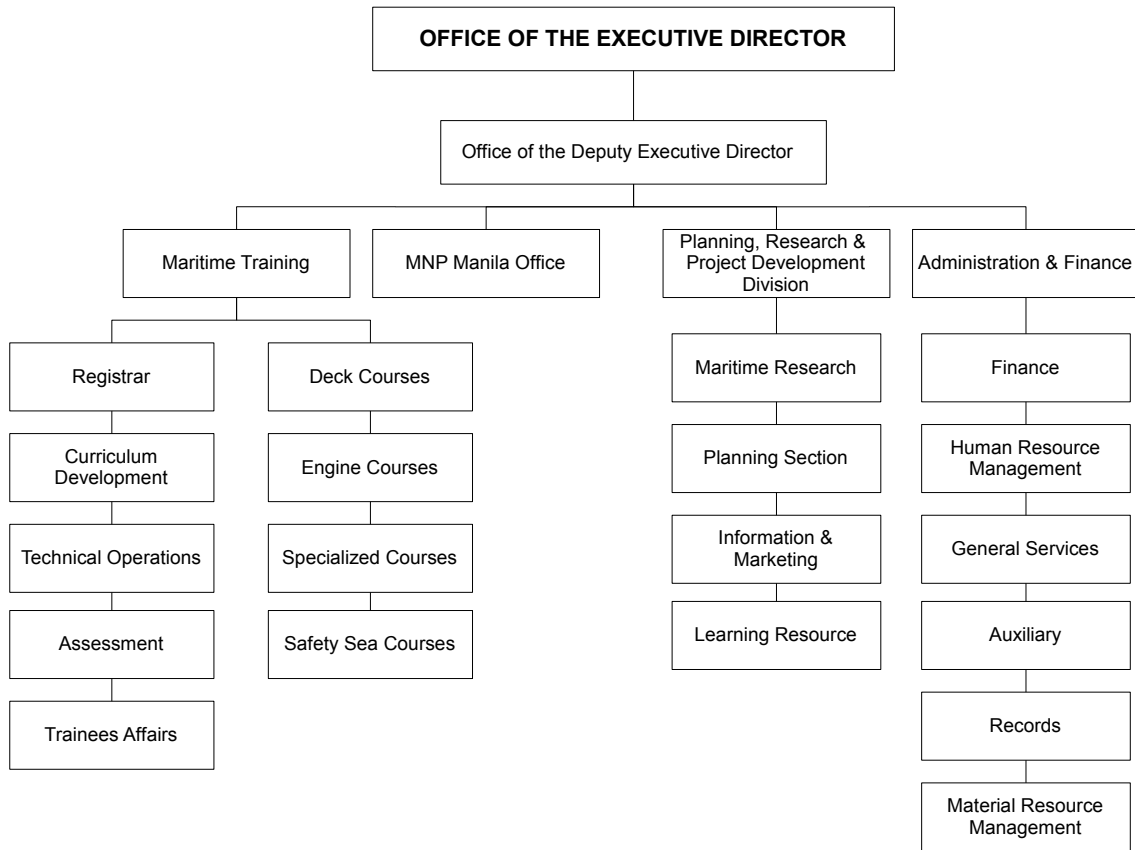
The amount of existing equipment is quite limited as shown above, therefore, all the equipment is kept in Palo storage yards. Under this situation, there is no significant problem for operation and maintenance of construction equipment so far. However, future repair cost and cost for spare parts which will be necessary after emergency rehabilitation and recovery works after typhoon Yolanda, seems to be a rather heavy burden on the Equipment Management Division of DPWH Region-VIII.

#### **2-4-5 Rehabilitation of Equipment for National Maritime Polytechnic**

##### **2-4-5-1 Organization and Staffing for Operation and Maintenance**

NMP is the organization directly under the DOLE. Therefore, NMP is run by the budget of DOLE. Thus, agencies experienced in the provision of equipment in this project is the DOLE, the agency responsible for maintenance of the equipment provided is NMP. Equipment provided is to be maintained by the staff of NMP in the same way that it has been in the past. Figure 2-4-12 is an organization chart of NMP. Among the 103 people on the entire staff of the current NMP, 54 people are full-time and 49 people are temporary staff.

Technical Operations (6 persons) is responsible for the maintenance of education and training equipment, General Service (11 people) is primarily in charge of maintenance of buildings and general equipment. Since the person in charge of both has the sufficient skill, there is no problem for the operation and maintenance of the equipment provided.



**Figure 2-4-12 Organization Chart of NMP**

**Table 2-4-16 Management Department in Charge of Providing Equipment (NMP)**

Item	Training to use	Department	Number of staff
Fast rescue boat and Davits	Basic training, High-speed rescue boat training	Specialized Courses	3
Totally Enclosed Lifeboat and Davits	Basic training, Lifeboat training (Survival)		
Various Safety Equipment	Lifesaving training, Firefighting training, First-aid training		
Full Mission Engine Room Simulator	ERM(Engine-room Resource Management) , Watch keeping training	Engine Courses	4
GMDSS simulator related equipment	GMDSS training	Deck Courses	4

\* Apart from the full time staff, the staff of 20 people is responsible for 4 Courses, including Safety Courses.

### 2-4-5-2 Budget Status

If education and training equipment has been provided by this project to the NMP, operation and maintenance after installation is carried out at the cost of NMP. Table 2-4-17 shows the budget status of NMP to the current fiscal year from fiscal 2009. The overall budget has been reduced and budget to buy new equipment has plummeted in fiscal 2014. It is plain that maintenance costs have increased to more than 40% of the overall budget in order to perform the restoration needed due to typhoon Yolanda damage. Therefore, the cost of maintenance of the equipment provided in NMP can be borne by NMP.

Also, because about one-third of the annual budget of the NMP every year is being used for maintenance, there is no concern about insufficient maintenance budget. From these circumstances, it is seen that there are no problems with the operation and maintenance for the provided equipment in the future.

**Table 2-4-17 Budget Execution Status of Each Fiscal Year (NMP)**

Year	Personnel expenses	Maintenance costs	Capital investment costs	Total
2009	31,039	32,443	38,050	101,532
2010	27,886	35,601	1,500	64,987
2011	30,911	27,418	34,932	93,261
2012	31,323	31,880	48,150	111,353
2013	35,222	34,360	24,300	93,882
2014	29,488	35,296	9,500	74,284

(Unit: Thousand Philippine Peso)

### 2-4-5-3 The Technical Capacity for Maintenance of Provided Equipment

The department in charge of maintenance of the equipment provided is Technical Operations, the staff number is six. Ability of these officials is at a high level, some personnel have trained a few months in Japan as a counterpart. They are accustomed to repair and maintenance of the equipment. They have been operating equipment equivalent to this project's, maintenance was also performed well from before the disaster. As a result, the knowledge and the skill that are required for the operation and maintenance of the procurement equipment will be obtained and it is possible that the Philippines can also perform the education and training needed in the future.

### 2-4-5-4 Contents of the Operation and Maintenance

To make effective use of the provided equipment, it is necessary to maintain it in good condition. For this purpose, it is necessary to conduct the operational and maintenance shown in Table 2-4-18.

**Table 2-4-18 Management Department in Charge of Providing Equipment (NMP)**

Item	Contents of the operation and maintenance
Fast rescue boat and Davits	Splashdown fast rescue boat, Storage, Driving, Hull maintenance, Bilge processing, Inspection and maintenance of Engine, Consumables replacement, Refueling, Touch-up paint, Greasing up of the movable parts, etc.
Totally Enclosed Lifeboat and Davits	Splashdown, Storage, operation, Hull maintenance, Cabin cleaning, Bilge processing, Inspection and maintenance of Engine, Consumables replenishment, Refueling, Touch-up paint, Oil, Greasing up of the movable parts, etc.
Various Safety Equipment	Consumables replenishment, Inspection, Repair, Drying, Keeping things in order, Storage, Operation verification, etc.
Full Mission Engine Room Simulator	Operation verification of system (Including software), Operation, Inspection and maintenance, Consumables replenishment, Greasing up of moving parts, etc.
GMDSS simulator related equipment	Operation verification of the system, maintenance and inspection, operation, consumables replenishing, etc.



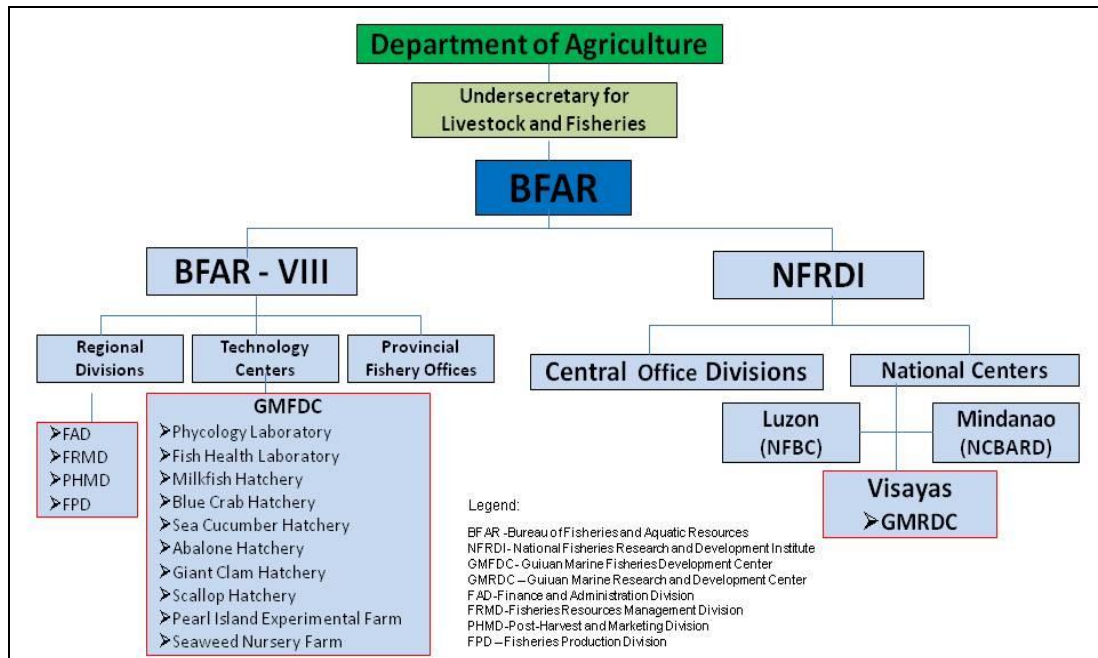
**2-4-5-5 Notes on Operation and Maintenance in the Current Situation**

Number of all employees is 103 people, full-time employees in 54 people, the rest are part-time staff. Given the effective operation of the provided equipment, employment should continue in the long term. In addition, the salary of the staff of NMP is lower than that of seafarers. Therefore, it is difficult to employ experienced excellent seafarers in the long term. This problem is a common problem of all Maritime Training Centers.

**2-4-6 Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center**

**2-4-6-1 Organization and Staffing for Operation and Maintenance**

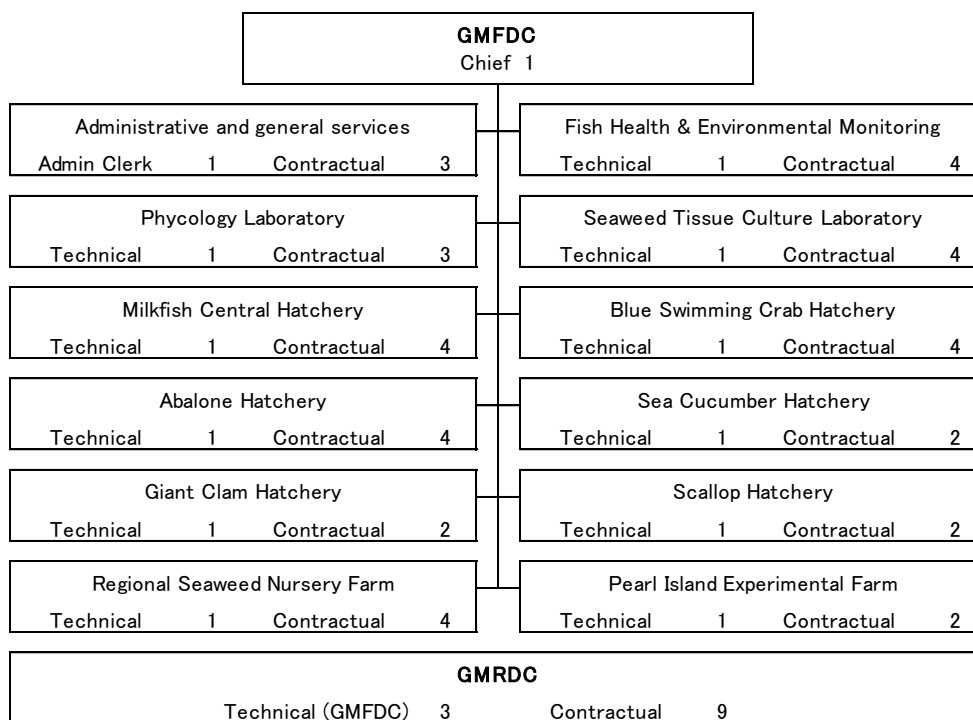
The procured equipment is going to be placed in GMFDC (Guiuan Marine Fisheries Development Center) an organization under the BFAR (Bureau of Fisheries and Agriculture Resources) of the DA (Department of Agriculture). GMFDC carries out operation and maintenance of the equipment with budget allocation from DA. The facility also houses the GMRDC (Guiuan Mariculture Research and Development Center) under the NFRDI (National Fisheries Research and Development Institute) of DA whose function is to conduct research. The organizational relationship diagram is shown in Figure 2-4-13.



**Figure 2-4-13 Organizational Relationship Diagram (GMFDC)**

The total number of staff engaged in GMFDC and GMRDC, is composed of 63 people. The organization chart and state of staffing are shown in Figure 2-4-14. GMFDC has 13 regular staffs including a chief in the total staffs of 38. GMRDC has 3 regular staffs in the total staffs of 12, however the 3 regular staffs are actually posted at GMFDC and work for GMRDC. There isn't any GMRDC original staff in the center.

The procured equipment is going to be operated and maintained under each section's technical staff supported by contractual staff, and also in collaboration with GMRDC.



**Figure 2-4-14 Organization Chart and Staffing (GMFDC)**

**2-4-6-2 Budget Status**

The budget status is shown in Table 2-4-19. GMFDC supplies fry that are hatched and farmed in the center and distributed to fishermen who are doing fish farming and provided to LGU (Local Government Unit) in the region for stock enhancement in the marine reserve. The revenue acquired for providing milkfish was 495 thousand pesos last year. However the amount is not used for operating expenses for the next season. It is remitted to the national treasury.

**Table 2-4-19 Budget Status of GMFDC, GMRDC**

(In thousand pesos)

Year	BFAR				NFRDI				Grand Total
	Personal Services	Maintenance & Other Operating Expenses	Capital Outlays	Total	Personal Services	Maintenance & Other Operating Expenses	Capital Outlays	Total	
2011	1,911	9,014	1,000	11,925	983	722	-	1,705	13,630
2012	2,016	9,056	1,000	12,072	1,116	1,705	1000	3,821	15,893
2013	2,087	9,130	1,000	12,217	1,265	1,250	1000	3,515	15,732

### **2-4-6-3 Maintenance Capacity**

GMFDC operates equipment that is equivalent to what will be provided and maintenance was performed well before the disaster. It is believed that GMFDC will operate and maintain the procurement equipment without problems, by following the maintenance guide procedure and instructions during the instillation as presented by the technician for the initial operation of the equipment. The project is going to make a trial run for the procurement equipment. And also the equipment includes the spare parts that are easily available in the Philippines. In addition, similar research equipment is operated in the BFAR Regional No. VIII office in Tacloban City and they share the necessary knowledge and experience with GMFDC. Thus, it is determined that it is possible to be operated continuously by the Philippines learning, sharing knowledge and experience with the equipment.

### **2-4-6-4 Contents of Operation and Maintenance**

The intake pump to be installed is a submerged type. There is a risk of damage when the sea is rough. The other matter is sucking a foreign object in along with the water. It may put the pump out of commission. Therefore, it is necessary to increase the frequency of inspection and cleaning, carrying out repair and timely update. The aim of the update is 6-10 years.

### **2-4-6-5 Current Status of Operation and Maintenance**

GMFDC has just one regular staff for each section and the others are contract staffs as shown in Figure 2-4-14. In addition, 3 GMFDC staffs are also doing functions of NFRDI which is research. Thus, the staffing situation should be noted. It is determined that the contract employees are continuously employed basically. However by fixing the position of the regular employment of experienced staffs, it supports the activity effectively for long-term operation.

NFRDI is positioned under the BFAR at the moment. There is a plan for it to be upgraded to the same level as BFAR in 2015. It should be considered to post the regular staffing of NFRDI to the GMRDC.

### **2-4-7 Rehabilitation of Equipment for Tacloban Airport**

#### **2-4-7-1 Human Resources Required for Operation and Maintenance of Equipment**

Three firefighters (One driver and two firefighters) are required to operate one Airport rescue and fire fighting vehicle procured by the Project, and two vehicles will be procured. Therefore, the necessary security personnel to operate equipment are 6 persons per shift. As equipment is operated in four shifts, the total required personnel would be 24. Presently, the Crash Fire and Rescue Section have sufficient manpower at 26, and additional manpower will be not required. Furthermore, since 21 security staffs (DOTC/OTS : Office of Transportation Security) have already been in office, the personnel who are operators, the 12 persons required for operation of security equipment are already satisfactorily employed.

### 2-4-7-2 Operation and Maintenance of Equipment

The operation and maintenance of the Airport Chemical Fire Engines is carried out by the Crash Fire & Rescue Section of Tacloban Airport. They have 26 staffs and 7 of the staffs are temporary workers. However, it has been planned to make them regular staffs in 2014. Moreover, they have a plan to recruit 4 additional staffs to make total 30 staffs. Although the current staff system can operate the project fire engines, this will make a more effective operation and maintenance system. The organization chart of Tacloban Airport is shown in Figure 2-4-15. As shown in 2-2-7, the airport utilizes the private sector on regular inspections of the vehicles. It is determined that there is no problem even in situations that require professional repair. The condition of X-ray Inspection Devices and Gate Style Metal Detectors is the same.

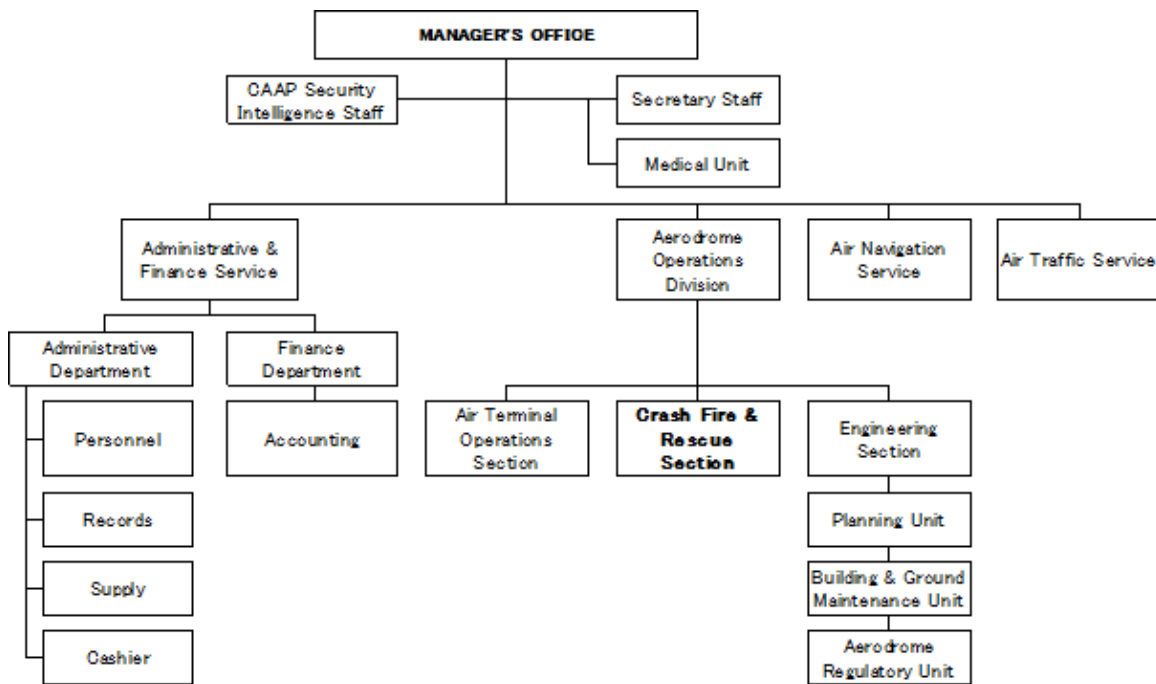


Figure 2-4-15 Organization Chart of Tacloban Airport

### 2-4-7-3 Budget Status

The budget for the daily operation and maintenance comes from the Maintenance and Other Operating Expenses (MOOE), which are allocated to Tacloban airport from DOTC/CAAP. The budget of Tacloban airport is shown in Table 2-4-20. It is the proposed budget for 2014. The budget for the period from 2011 to 2013 was 43 million pesos per year. The increase in the total budget is a consequence of the plan to increase up to 159 regular employees by shifting from contract staffs and recruiting new staffs, from the 135 staffs at present.

Table 2-4-20 Management Department in Charge of Providing Equipment (Airport)

Year	Personal Services (peso)	MOOE (peso)	Capital Outlays (peso)	Total (peso)
2014	33,664,634	38,846,344	16,200,000	88,710,978

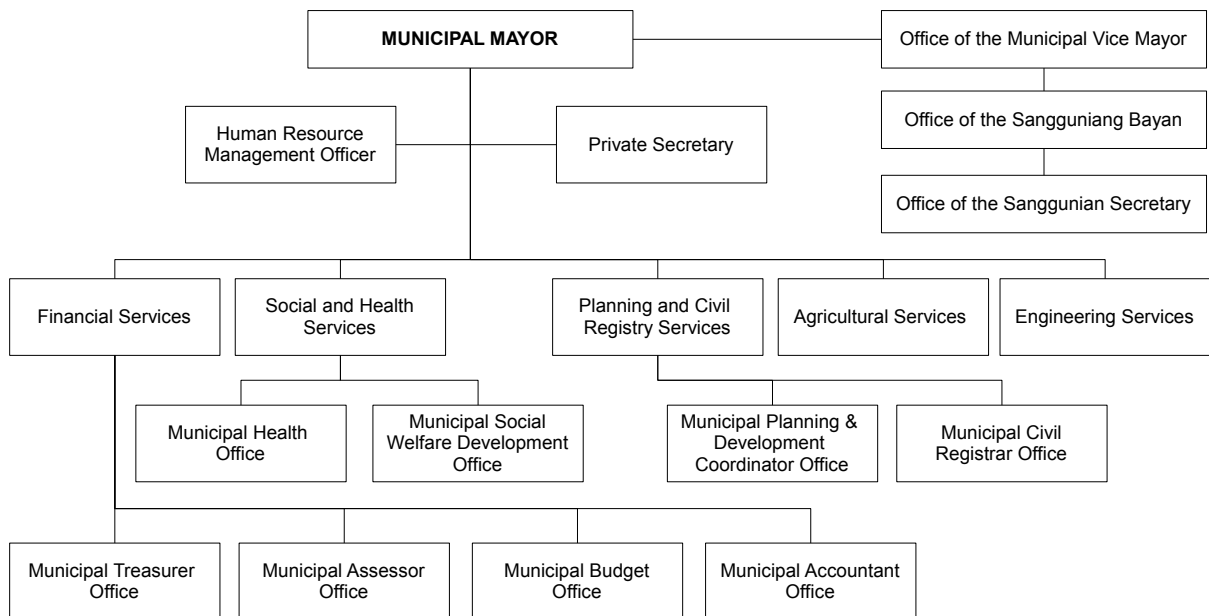
**2-4-7-4 Education and Training of Human Resources**

Education and training of human resources necessary for the Project will be executed through operation/maintenance training by the manufacturers. Details are explained in “2-2-7-3(7) Operation Guidance Plan” As a result, necessary education and training for operation/maintenance of the equipment will be carried out by the Project, and necessary education and training in the future will be continuously carried out by the Philippines side.

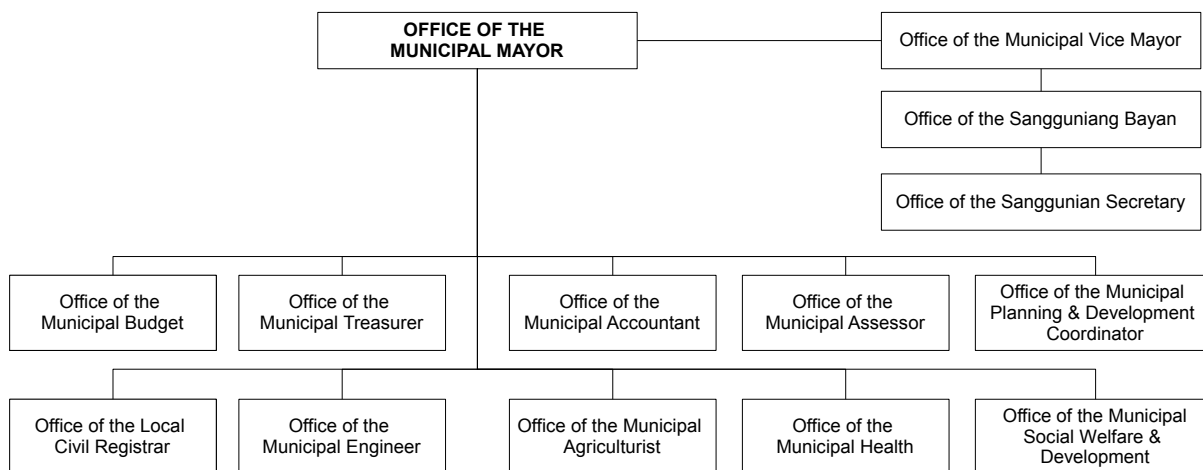
**2-4-8 Reconstruction of Local Government Offices**

**2-4-8-1 Organization and Staffing for Operation and Maintenance**

Maintenance of the town halls is the responsibility of each Local Government Unit (LGU), especially the engineering section is in charge of technical support. The organization chart of Lawaan municipality and Marabut municipalities are shown in Figure 2-4-16, Figure 2-4-17.



**Figure 2-4-16 Organization Chart of Lawaan Municipality**



**Figure 2-4-17 Organization Chart of Marabut Municipality**

Number of all staffs of the municipality and staffing of the engineering section is shown in Table 2-4-21. The number of all staffs includes regular staffs, contract staffs, the mayor and councilors. The building maintenance is mainly supported by the maintenance section, but also daily maintenance is carried out by utility workers. Both municipalities employ around 5 utility workers.

**Table 2-4-21 Number of Staffs (Local Government Office)**

	Number of Staffs of Municipality	Name of Maintenance Section	Number of Staffs of Maintenance Section	Number of Engineers
Lawaan	72	Engineering Services	5	1
Marabut	135	Office of the Municipal Engineer	1	1

#### 2-4-8-2 Budget Status

The budget status of Lawaan and Marabut municipalities are shown in Table 2-4-22. Both budgets are increasing. The buildings under the control of the municipality are the town hall, RHU, market house, etc. The budget of the Maintenance & Other Operating Expenses (MOOE) is for operation and maintenance of these buildings and also budget of others is utilized as one of the special purpose appropriations.

In order to make effective use of the limited budget, the budget allocation tends to intensively distribute priority section each year. The budget of personal services consists of around 50% of total budget, as the maximum rate of personal services is regulated in the Local Act. in order to allocate the budget to required municipality services including infrastructure maintenance.

**Table 2-4-22 Budget Status of Lawaan, Marabut Municipality**

	Year	Personal Services	Maintenance & Other Operating Expenses	Capital Outlays	Others	Total
Lawaan	2011	19,757,731	6,010,728	-	11,240,205	37,008,664
	2012	20,417,765	7,024,778	105,000	11,576,924	39,124,467
	2013	22,503,399	8,255,600	62,000	12,889,374	43,710,373
Marabut	2012	20,692,529	9,211,356	300,000	10,353,962	40,557,846
	2013	22,870,748	10,387,374	300,000	11,791,375	45,349,497
	2014	25,129,629	11,308,425	350,000	13,468,018	50,256,072

### **2-4-8-3 Office Building Maintenance Capacity**

Both municipalities employ an appropriate engineer and utility workers for the daily maintenance. However, the lack of skilled technicians is a concern when working with technical repair. It is determined that a close relationship with DPWH is needed for construction of the town hall, and joining in the construction contributes to the engineer's technical capacity development.

### **2-4-8-4 Contents of Operation and Maintenance**

There is no need for special maintenance for the town hall to be constructed under this project. Daily cleaning and checking the condition of the facility is important. Utility workers carry out simple carpentry, electrical repair and pipe repair. Therefore, there is no problem maintaining the day-to-day problems.

### **2-4-8-5 Current Status of Office Building Operation and Maintenance**

Both municipalities employ an appropriate engineer. However engineer for the buildings and infrastructure under the municipality is limited. The shortage of regular staff of the maintenance section is a concern, particularly in Marabut municipality.

In addition, the new buildings have been planned based on disaster prevention with new architecture standards. Therefore, the engineer should join in the construction work with DPWH to build up his technical capacity.

## **2-5 Other Relevant Issues**

### **2-5-1 Reconstruction of Elementary School**

#### **2-5-1-1 Bearing Value Added Tax**

DepEd shall arrange necessary processes for VAT refund since value added tax of the project shall be the responsibility of DepEd. Since the payment reimbursement system is a regular procedure as a tax refund, it is important to coordinate with DepEd in order to carry out necessary processes including securing their budget.

#### **2-5-1-2 Prevention of Overlapping with Other Donors' Support**

Since it will take about two years from the commencement till completion of the construction, community will continue to face the current poor environment for teaching and learning during the construction period, which may encourage some communities to accept other donor's offers to build school facilities faster than this Project by the Japanese side. In order to prevent overlapping with other donors' supports, it is recommended to coordinate with UNICEF, which has been providing temporary school facilities for the affected areas, to facilitate temporary facilities until the schools are handed-over.

### **2-5-2 Reconstruction of Medical Facilities**

DOH shall arrange necessary processes for VAT refund since value added tax of the project shall be the responsibility of DOH. Since the payment reimbursement system is a regular procedure as a tax refund, it is important to coordinate with DOH in order to carry out necessary processes including securing their budget.

### **2-5-3 Rehabilitation of Electricity Equipment**

The consideration for the grant assistance project implementation is as follows:

- In Esamelco, to secure the operators and mechanics for BTwD and make existing mechanics acquire the knowledge and skill required for maintenance work for BTwD before the provision

### **2-5-4 Recovery of Construction Equipment**

The warehouse for the construction equipment has also been damaged by this typhoon. Roofs and windows have been blown away and the wall of the warehouse has collapsed. It needs to be repaired completely prior to new equipment arrival. If it is possible, the warehouse itself should be relocated to a place safer from storm surge.

Prior to the project implementation, therefore, the progress of the repair works on the warehouse for the construction equipment shall be carefully monitored.

### **2-5-5 Rehabilitation of Equipment for National Maritime Polytechnic**

#### **2-5-5-1 Installation Site**

There is a fear that the educational equipment to be provided by the project could be damaged by a typhoon like Yolanda. Therefore, the new equipment to be installed in the second floor of the training building or in the new training building on the hill.

#### **2-5-5-2 Technology Transfer**

At the same time as the provision of equipment, technology related to maintenance and operation will be transferred from the manufacturer. In addition, technical information for maintenance will be provided.

### **2-5-6 Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center**

Yolanda-damaged equipment, ceilings, lighting, etc. should be removed from the hatcheries and laboratories before the Project starts.

### **2-5-7 Rehabilitation of Equipment for Tacloban Airport**

The consideration for the grant assistance project implementation is as follows:



- Complete the repair of the other passenger terminal building and airport related facilities DOTC/CAAP is due to perform within 2014 before installing the equipment procured by project.

#### **2-5-8 Reconstruction of Local Government Offices**

DILG shall arrange the necessary processes for VAT exemptions since the value added tax of the project shall be the responsibility of by DILG. Since the money pay-back system is a regular procedure for a tax exemption, it is important to coordinate with DILG in order to carry out necessary processes including securing their budget.

## **CHAPTER 3      Project Evaluation**

### **3-1    Preconditions**

#### **3-1-1    Reconstruction of Elementary Schools**

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

- Adequate land for the project is to be secured, and the construction permit shall be ready to be issued.
- Bearing VAT shall be the responsibility of the Philippines side, which means that all tax payments for the project that are made shall be reimbursed.

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

- DepEd's disaster management organization shall function as planned in case of any disaster.
- At school facilities, operation and maintenance shall be carried out smoothly by DepEd.

#### **3-1-2    Reconstruction of Medical Facilities**

##### **3-1-2-1    Requirements for Project Implementation**

###### **(1)    Conditions Related to the Environment**

The RHU is the functional center for rural health-care and medical service. Prompt rehabilitation of the huge damaged that was sustained will provide the neighborhood community with a safe and usual life.

###### **(2)    Conditions Related to Facilities**

The RHU will be recovered for rural first-aid center with high protection against wind-load and installation of an emergency generator.

##### **3-1-2-2    External Conditions to Achieve the Overall Plan**

###### **(1)    Basic Conditions**

Implementation Agency: DPWH

Maintenance Agency: Local Government Unit, Head Office with technical support from DPWH.

Operation and Supervision: Region VIII of Leyte and Samar conduct operation and supervision of RHU with support and monitoring by DOH

## **(2) External Conditions**

- Sufficient number of medical staff shall be allocated in the target area.
- Sufficient management/maintenance fees shall be allocated in the target area.
- Medicines, medical material and vaccines shall be supplied in the target area.

## **(3) To Achieve the Goal**

Prompt rehabilitation which is to a new standard with more protective capacity will be a model for medical facilities which aims at reducing damage with the policy of BBB.

### **3-1-3 Rehabilitation of Electricity Equipments**

In order to implement the project, the following items are required to be conducted by the Philippines without delay.

- Procedure of Banking Agreement (B/A) and Issue of Authorization to Pay(A/P)
- Customs Procedure (Bearing Duty, Customs Charge)
- Application for Car License

### **3-1-4 Recovery of Construction Equipment**

#### **3-1-4-1 Requirements for Project Implementation**

##### **(1) Conditions Related to the Environment**

The debris along with daily garbage is being piled up layer by layer since beginning the disposal of the debris after Typhoon Yolanda. It is, therefore, requested that the new final disposal location which has countermeasures against environmental pollution such as bad smell and contaminated water, will be appointed and relocated as soon as possible.

##### **(2) Conditions Related to Facilities**

The warehouse for the construction equipment has been damaged by this typhoon. Roofs and windows have been blown away and the wall of the warehouse has collapsed. It needs to be repaired completely prior to new equipment arrival.

#### **3-1-4-2 External Conditions to Achieve the Overall Plan**

##### **(1) Basic Conditions**

Additional manpower and budgets for the Equipment Management Division must be secured commensurate with the increase in construction equipment.

## **(2) External Conditions**

Concrete policy for emergency rehabilitation and recovery activity shall be improved and integrated based on the presidential decree for a “40m’s non-build zone from the sea shore”.

### **3-1-5 Rehabilitation of Equipment for National Maritime Polytechnic**

#### **3-1-5-1 Requirements for Project Implementation**

##### **(1) Conditions Related to the Environment**

In the case of Filipino seafarers that are on board as staff of foreign vessels, approval by the other countries of the certificate they are getting is required. Therefore, in order for the certificate to be approved by the other countries, the equipment of the training institutions to issue the qualification certificate must comply with the requirements of the STCW Convention. Training equipment of NMP was damaged by the typhoon Yolanda, and they cannot now satisfy the STCW Convention. Therefore, it is necessary to restore the education and training equipment of NMP to satisfy the conditions of the STCW Convention by this project.

##### **(2) Conditions Related to Construction**

Basic policy is to replace the existing. However, because education and training equipment is expensive, it should be relocated to a location that is not subject to damage caused by a disaster in the future. Local contractors will conduct in the installation work.

#### **3-1-5-2 External Conditions to Achieve the Overall Plan**

After the education and training equipment have been provided, effective education and training is expected. Then, the planning of the project is to be achieved, cost for operation and maintenance is also provided as necessary. In addition, NMP needs to ensure that the instructor has sufficient knowledge, skills and qualifications.

If NMP is to issue credentials, it must be approved by MARINA to see if it satisfies the STCW Convention. Therefore, before performing the training using the restored training equipment, it is necessary for MARINA to consider the qualification of the instructors and condition of the training facilities. A number of seafarers are living in the Visayas. Approximately 13-14% of Filipinos are seafarers. And the poor seafarers have a tendency to use the training center nearest to his home. Furthermore, NMP has established a marketing section in the organization, and NMP grasps the needs of shipping companies and seafarers. Recently, there has been a tendency for the number of trainees to increase. Therefore, it is necessary to ensure that the trainees are satisfied when the training equipment is offered.

### **3-1-6 Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center**

#### **3-1-6-1 Requirements for Project Implementation**

##### **(1) Conditions Related to the Environment**

The Guiuan Marine Fisheries Development Center (GMFDC) was established in 1961 and has never been in a no-build zone contrary to the government decision for its establishment. In fact, the Center has functioned as a production and extension office for fishery technologies for the eastern-part of Samar and the entire Eastern Visayas (Region 8).

#### **3-1-6-2 External Conditions to Achieve the Overall Plan**

##### **(1) Prerequisite**

The Center will build a self-management support system if granted any support from JICA. The Center is a government agency, which enjoys full support from the national government for its entire operation.

##### **(2) External Conditions**

There has to be no problem from the Bureau of Customs to avoid delay in the delivery of equipment if purchased outside of the country.

### **3-1-7 Rehabilitation of Equipment for Tacloban Airport**

For proper implementation of the Project, it is a prerequisite that the following shall be undertaken by the Pakistani side without delay.

- Banking Arrangement (B/A), and Issuance of Authorization to Pay (A/P)
- Customs Formalities (Bearing Tax, Customs Clearance Fee)
- Acquisition of permission for installation of X-ray scanning apparatus from Philippines Department of Health
- Implementation of Power Supply Works

### **3-1-8 Reconstruction of Local Government Offices**

- Prerequisite Conditions for the Implementation of the Project1) Adequate land for the project is to be secured, and the construction permit shall be ready to be issued.
- VAT shall be the responsibility of the Philippines side, which means that all tax payments by the project shall be beared

### **3-1-8-1 Prerequisite and External Conditions for the Achievement of the Overall Project**

- Disaster management organization of the Municipal Office shall function as planned in case of any disaster.
- As Municipal Office facilities, operation and maintenance shall be carried out smoothly.

### **3-2 Necessary Inputs by Recipient Country**

#### **3-2-1 Reconstruction of Elementary Schools**

A disaster management organization shall be established and improved by the Philippine side for each elementary school that operates and maintains school facilities.

#### **3-2-2 Reconstruction of Medical Facilities**

It will be suggested that the Philippine Government shall verify and support the following requirements to ensure sustainable function for the RHU and EVRMC.

- Necessary numbers of medical staffs shall be allocated for the new RHU.
- Maintenance/ managing fee and medicines/medical equipments shall be supplied to the new RHU.

#### **3-2-3 Rehabilitation of Electricity Equipment**

In order to sustain the effect after completion of project, the Philippines needs to carry out the following items.

- To keep the heavy equipment in good condition, daily maintenance and inspection is required
- To provide educational training for newly recruited personnel to secure human resources for maintenance work for heavy equipment when new recruitment of human resources is needed

#### **3-2-4 Recovery of Construction Equipment**

- It is to be monitored carefully that the construction equipment granted to DPWH will be maintained and repaired well and the spare-parts for 1 (one) year will be provided.
- The warehouse for the construction equipment has been damaged by this typhoon. Roofs and windows have been blown away and the fence-wall of the warehouse has collapsed. It needs to be repaired completely prior to new equipment arrival. If it is possible, the warehouse itself will be relocated to a place safer from storm surge.
- Currently, the debris from the typhoon is being disposed of in a location on the mountain side in the northern part of Tacloban city 15km from the city. The debris along with daily garbage is being piled up layer by layer since beginning of disposal for the debris after Typhoon Yolanda. It is, therefore, requested that a new final disposal location which has countermeasures against the environmental pollution such as bad smell and contaminated

water, will be appointed as soon as possible. Meanwhile, the immediate countermeasures against environmental pollution, such as bad smell and contaminated water, at the existing disposal location is immediately necessary.

- In addition to the main storage yard in Palo, there are 5 other storage yards in Leyte and Samar Island. To prepare for unexpected damages caused by a disaster such as a big typhoon, all of the equipment shall be arranged in those storage yards and be in stand-by mode before typhoon season comes in the Philippines.
- Additional manpower and budgets for the Equipment Management Division must be secured commensurate with the increase in construction equipment.

### **3-2-5 Rehabilitation of Equipments for National Maritime Polytechnic**

If education and training equipment has been provided, effective education and training must be performed if they are to be used effectively and the plan of this project is to be achieved, the Philippines must accept the burden of the following.

- Provide a location for the provided equipment
- Cover the cost for operation and maintenance to the provided equipment
- Ensure that the instructor has sufficient knowledge, skills and qualifications.

As shown in Table 2-4-17, labor costs for this year are reduced because the number of trainees is reduced compared with last year. Because it is not a particularly large decrease as compared to the previous years, the conditions that can ensure that the instructors stay on are in place. In addition, NMP is committed to the development of the ability of the instructors, each instructor fully satisfies the conditions which the STCW Convention are seeking. Thus, the training with the training equipment is provided, which is guaranteed in terms of human resources and costs. From this fact, NMP commitments necessary to achieve this project have been secured.

### **3-2-6 Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center**

- Despite the fact that GMFDC is designed to produce revenues from the seed production and procurement, the Philippine government needs to implement appropriate budgetary measures for the Center to be properly run and maintained.
- Establishment of the operation and maintenance system, including training and recruitment of pump and electrical maintenance staff, etc., is an important element in ensuring the smooth operation of GMFDC. Particularly, the maintenance for the seawater intake equipment is key to GMFDC activities, it is necessary to secure facility functions by compiling and executing an appropriate maintenance plan.
- Technical and staff exchange programs between GMFDC and the Southeast Asian Fisheries Development Center (SEAFDEC) in Iloilo should be encouraged for improving the efficiency of various activities. In the future, GMFDC should be able to actively share its own techniques and research results with the other regions as contributions.

### **3-2-7 Rehabilitation of Equipment for Tacloban Airport**

For production and continuation of the Project effects after completion of the Project, the following shall be undertaken by the Philippine side.

- To maintain equipment in good condition by daily maintenance and inspection for all equipment
- To provide educational training for newly recruited personnel to secure human resources for maintenance work for heavy equipment when new recruitment of human resources is needed
- An adequate budget for operation and maintenance of procured equipment shall be secured.

### **3-2-8 Reconstruction of Local Government Office**

A disaster management organization for each Municipal Office that operates and maintains the facility shall be established and improved by the Philippine side.

## **3-3 Project Evaluation**

### **3-3-1 Reconstruction of Elementary Schools**

#### **3-3-1-1 Relevance**

- Elementary education is crucial for human development, sociality creation and learning of basic academic ability, and is compulsory for all the children. In the schools which suffered serious damage from typhoon Yolanda, the classes have been operated under harsh conditions such as temporary tents and classrooms covered with plastic sheets as the temporary replacement for the original roofs that were blown off. The Project improves this environment by re-construction of the school buildings.
- When typhoon Yolanda landed, some residents evacuated to the school buildings nearby, however the said building itself collapsed. If we provide school buildings resilient against strong wind, in the East Visayas Region where the typhoons frequently land, the schools could provide a space for the people to evacuate to safely.
- In addition to the above, when typhoon Yolanda attacked, the evacuated residents suffered from the storm surge that came up to the ceiling level of the building. In the school sites located near the coast, a building type in which all the classrooms are elevated to the second floor level and the ground floor is a piloti system shall be applied. Because of this building type, even if storm surge hits the school property, the damage to the building is minimized and the second floor will be the safe space for evacuees and it saves human lives.
- We expect that the school buildings constructed with the above mentioned policies shall be designated as the future “Model School” in the Philippines and contribute to improvement of the physical quality of the school facilities throughout the country.



### **3-3-1-2 Effectiveness**

#### **(1) Quantitative Effect**

##### **1) Beneficial Population**

- Approximately 2,400 students (8 schools, 60 classrooms, 40 students per classroom), their families and local communities shall be beneficiaries of the school building construction.

#### **(2) Qualitative Effect**

##### **1) Recovery of Basic Education**

- Recovery of school buildings contributes to the improvement of the study environment of basic education stage.
- Improvement of educational environment will build human resources who will contribute to the development of the future of the nation.

##### **2) Improvement of Building Durability**

- New resilient buildings can contribute toward lowered maintenance and the long-life span.

##### **3) Provision of Safe Buildings**

- The new buildings which are resilient against the external forces of disaster (typhoon, earthquake, tsunami, storm surge, etc.) can contribute to developing a resilient city and areas against such disasters.
- The new facility can be used for evacuation space in case of emergency, and can provide safe and secure circumstances in the area devastated by Typhoon Yolanda.
- The new buildings may symbolize the strong relationship between Japan and the Philippines and they will provide the opportunity to keep alive the Japanese experiences and lessons obtained from the past disasters

### **3-3-2 Reconstruction of Medical Facilities**

#### **3-3-2-1 Relevance**

- The RHU is the functional station of rural health-care and medical services for the neighborhood. The rehabilitation of the RHU which were damaged by typhoon Yolanda will promptly recover the function for the neighborhood through the assistance of the Grant Aid.
- The real and practical health and medical facility in rural area is the Rural Health Unit (RHU) in each Municipality. They are providing daily examinations, vaccinations,

mother and infant care and various public health activities. Under RHU, there is a community level facility, BHS (Barangay Health Station). Recovery of RHU leads BHS to careful daily provision of mother and infant care and limited health consultation, but it is just at the community level.

- A new RHU and EVRNC which will be implemented based on this policy will be expected to become a new model in the future Philippines, with the advantage of high quality.
- It is a project for reconstruction for the existing facility, not new construction of the facility, therefore it does not produce any problems in socio-ecology.
- Rehabilitation or re-construction will be implemented without any difficulty by the Japanese Grant-Aid system which has high technology and construction methods.
- It shall supply necessary medical equipment to a RHU which will be planned and constructed based on the new concept. Therefore a functional Rural Health-care center will be recovered.
- The RHU will be recovered to serve as a rural first-aid center by rehabilitation with high protection against wind-load and installation of an emergency generator. The RHU will be an emergency evacuation and first-Aid center for the neighborhood particularly in East Visayas where typhoons often land.
- A type of Piloti System will be planned to elevate every room to the second floor near the seashore. Therefore it will be protected against flood by storm tide and it can minimize damages to the buildings, and it will be safe on the second floor for neighboring communities. It will usually be utilized for the activities of assemblage under the shade and be comfortable in rainy days.

### **3-3-2-2 Effectiveness**

#### **(1) Quantitative Effect**

##### **1) Benefit for Many Neighborhoods**

- Population of 57,146 in Abuyog, 41,757 in Dulag, 15,115 in Marabut, 11,612 in Lawaan, in total 125,000, benefit by rehabilitation of RHUs.
- Total population of 4,100,000 in Region VIII benefit by new EVRMC.

#### **(2) Qualitative Effect**

##### **1) Contribution for Regional Health and Medical Service**

- Recovery of function of RHU increases the safety and health of the Neighborhood, and their happiness will spread.

## **2) Improvement of Maintenance Cost**

- The new medical facility built to have strong resistance will be an easy maintenance facility with a long span of life.

## **3) Provision of Safe Buildings**

- The new building which is resilient against the external forces of disaster (typhoon, earthquake, tsunami, storm surge, etc.) can contribute to developing the resilient city and areas against such disasters.
- The new facility can be used for evacuation space in case of emergency, and can provide safe and secure circumstances in the area devastated by Typhoon Yolanda.
- The new buildings may symbolize the strong relationship between Japan and the Philippines and they will provide the opportunity to perpetuate the Japanese experiences and lessons obtained from the past disasters

## **4) Effects by Medical Equipment Procurement**

- To provide MCH services, or immunization, laboratory service, examination, delivery care, neonatal care and so on,
- To provide medical services to deal with minor surgery for slight injuries and dental treatment for tooth caries and abscesses,
- To assist outreach activities to procure carrying kits for midwives to cater MCH services for local residents, and
- To strengthen emergency transportation service by procurement of ambulances to carry emergency cases to upper-level facilities such as provincial hospitals and EVRMC.
- To secure essential medical care by uninterrupted solar power supply system for a vaccine refrigerator and proper lighting for night deliveries especially at the disaster time.
- It is expected that restoration of RHUs' functions by reconstructing and equipping of RHUs will contribute to improvement of relatively inferior MCH indicators such as IMR and MMR in this region.

### **3-3-3 Rehabilitation of Electricity Equipments**

#### **3-3-3-1 Relevance**

- The heavy equipment owned by each EC was seriously damaged due to the super typhoon and storm surge. Approximately 50% of the total system is currently functional and the rehabilitation and recovery work is proceeding relying on the cooperation of other distribution companies. The faulty heavy equipment is under repair. However, how much of the faulty heavy equipment can be put back into operation is not clear. Moreover, the

available heavy equipment has been used for around 20 years and has deteriorated due to aging. Therefore there is risk that the recovery work might be delayed due to the occurrence of troubles and lack of availability of the heavy equipment. In order to expedite the rehabilitation and recovery work and realize quick reconstruction of the power distribution facilities, the provision of heavy equipment through this project is valid.

- Each EC requires extensive funds to procure a wide variety of power distribution facilities. However the individual EC cannot afford to procure them on their own due to a lack of their own funds. Accordingly, each EC is procuring necessary facilities, such as transformers and wires, utilizing the subsidy and calamity loan provided by the Philippine government. (For example, Dorelco plans to apply the calamity loan to all damaged transformers. The total expense is estimated to be 83,122,760 PhP. However heavy equipment is not included in the loan funds. Therefore it is valid to provide heavy equipment through this project in consideration of the financial status of each EC.
- The power distribution system materials and facilities are being procured from the U.S, China, and Korea, in addition to the Philippines. However no provider of heavy equipment exists as of February 2014 and, therefore, it is valid to implement the provision of heavy equipment through this project.

### **3-3-3-2 Effectiveness**

As outputs of project implementation, the following quantitative and qualitative effects can be expected.

#### **(1) Quantitative Effect**

##### **1) Realization of Prompt Recovery Work**

- Based on the availability of heavy equipment owned by each EC, the rehabilitation and recovery work is expected to be accelerated to double or triple the current speed.

#### **(2) Qualitative Effect**

##### **1) Evaluation of Japanese Vehicles**

Japanese vehicles are highly regarded based on word from engineers of each EC and related persons. There is a comment that the Japanese vehicle hardly ever breaks down and has high mobility, which is better than other countries' vehicles. Therefore further improvement of the Japanese brand is expected.

## **2) Quick Impact**

Each EC already has operators for heavy equipment and the manpower is ensured. A quick impact by the provision of heavy equipment is expected after implementing this project.

## **3) Improvement of Maintenance Capability in the Medium Term**

After total restoration of power distribution facilities, improved availability of heavy equipment is expected to contribute to the power distribution system maintenance work and construction work.

### **3-3-4 Recovery of Construction Equipment**

#### **3-3-4-1 Relevance**

DPWH-Region VIII is responsible for the rehabilitation and recovery activity after disaster occurs and timely disaster prevention activity before typhoon season comes in Leyte and Samar islands. However, the amount of construction equipment owned by DPWH to be used for such activities is totally inadequate if another big typhoon like Yolanda comes.

The debris in Leyte Island is being cleaning up using the construction equipment borrowed from DPWH offices in all over the Philippines at this moment. But, it is still a long way to complete such activities in the remaining areas, such as several municipalities and barangays in Samar Island. Besides, it is strongly noted that the first 72 hours are quite important to rescue people's lives under the debris, so that immediate rescue activity is definitely necessary. The additional construction equipment can contribute to accelerate the emergency activities faster and wider as well as to rescue people's lives because of immediate rescue works after a disaster occurs.

In consideration of the above situation and in order to accelerate the rehabilitation and recovery activities after typhoon Yolanda, the supply of construction equipment is quite useful and adequate as well. They are also useful for maintenance of infra-structure before typhoon season comes to prevent disasters and minimize the damage.

Because of their technical advancements the Japanese branded equipment operates well and with accuracy, and it also has higher durability than those of Korean and China. This is why Japanese branded equipment is firstly recommended. Besides, procurement of construction equipment can be executed smoothly without any difficulties in compliance with Japanese Government's Grant Scheme.

#### **3-3-4-2 Effectiveness**

The following are the expected effects that will be obtained from this project.

## **(1) Quantitative Effect**

### **1) Speeding up of the Debris Management**

Through properly combining the use of the backhoe, wheel loader and dump-trucks, the debris management which is ongoing in town will become faster and smoother than now. For example, one backhoe can load the debris at 130~310m<sup>3</sup> per day. It means that one backhoe can clean up the debris which is currently held in a temporary stock yard 10m long x 10m wide x 1.3~1.3m high, in just one day.

### **2) Immediate Rescue Activity**

The first 72 hours are quite important to rescue people's lives under the debris, so that immediate rescue activity is definitely necessary. The additional construction equipment can contribute to accelerate the emergency activities faster and wider as well as to rescue people's lives because of immediate rescue works after disaster occurs.

### **3) Immediate Road Opening**

Because of a decrease of debris volume in the city, the traffic congestion in surrounding areas can be reduced. In the same calculation as above, the mounted debris of 1,000m<sup>3</sup> in temporary stock yards will be removed within just one week if a good combination between backhoe and dump-truck operation can be achieved.

## **(2) Qualitative Effect**

### **1) Improvement of Living Environment**

Bad affects to the living environmental are seen at the temporary debris stock yards due to no separation of garbage and debris after the disaster. High temperature and humidity, particularly, cause the garbage to decompose at the said yard. Fires and growing of flies are also going to be an obstacle for daily life in surrounding areas although DPWH and LGU are continuing to manage the debris with their best efforts. Additional equipment, which is planned to be granted, can help make such management faster and more effective.

### **2) Recovery of Orderly Traffic System**

Because of reducing of traffic congestion, the orderly traffic system in the city will recover soon and it may prompt road safety.

### **3) Visualization of Japanese ODA**

Because of the activity and movement of equipment which carries the Japanese flag, HINOMARU, most people in Tacloban can be aware of Japanese ODA and understand how the Japanese Government assists Tacloban city as well as the Philippines.

### **4) Strengthening of the Confidential Relationship with both Countries**

Construction equipment to be granted is not only useful for rehabilitation and recovery activity but also will be helpful for future disaster prevention activity before the rainy season. It means that, therefore, the supply of that equipment can contribute to maintain good relationships among both countries continuously.

### **3-3-5 Rehabilitation of Equipment for National Maritime Polytechnic**

#### **3-3-5-1 Relevance**

- All of the grant aid equipment (1. High speed rescue boat, 2. Totally enclosed lifeboat, 3. Various safety equipment, 4. Full mission type engine room simulator, 5. GMDSS simulator related equipment) that will be donated were installed in NMP previously. Education and training for seafarers which has been conventionally performed in NMP can no longer be carried out due to the damage from typhoon Yolanda. By the implementation of this project, NMP can reopen the education and training necessary for the acquisition of the certification of international conventions. These trainings are necessary for the embarkation and promotion of seafarers. As a result, these trainings contribute to increase the competency of Filipino seafarers, and increase their opportunity for employment. And seafarers' contribution to the foreign currency acquisition of the Philippines will be secured.
- At present only 12 courses in total (Deck 1, Engine 4, Safety 2, Maritime 5) are being carried out. It carried out 33 courses before typhoon Yolanda, the courses decreased sharply to around one third. If amount of functional equipment is increased, the number of training courses will increase. NMP has repaired some of its own equipment and that means that four courses could be resumed for a total of 16 training courses. When the equipment donated by grant aid arrives, the 17 remaining training courses can start again, and NMP can return to the 33 courses that were offered before the disaster.
- To teach safe handling of a high-speed rescue boat in an emergency, NMP had been conducting training using a high-speed rescue boat. However, both high-speed rescue boat and its davits were damaged by the typhoon. As a result, both pieces of equipment are unavailable. Therefore, training using the high speed rescue boat is stopped now.
- The totally enclosed lifeboat that was equipped in NMP was severely damaged by the typhoon. Because of the risk of boat capsized, inspectors have banned the use of the boat.

Therefore, the boat is not available for actual training. In addition, the boat davits are unusable.

- Due to the damage caused by typhoon Yolanda, the survival and safety training equipment that was owned by NMP was mostly destroyed. Further, the equipment that wasn't destroyed was unusable, because it became trapped under other training equipment.
- NMP had been conducting ERM training and watch keeping, these are required to use an engine room simulator by the STCW Convention. However, the engine room simulator that was bought by NMP is unusable, because it was submerged by the storm surge. In addition, the engine room simulator that was provided by JICA in the expansion plan of NMP broke about five years ago. However, it is impossible to be repaired because the CPU is not manufactured any more. Thus, training using an engine room simulator has been discontinued.
- The GMDSS simulator and related equipment were submerged by the storm surge. Therefore, the function of the education and training of equipment has been lost completely and GMDSS training has been discontinued.
- In the expansion plan of NMP, which was conducted in 1985, a variety of equipment was provided by the JICA. In the subsequent investigation, it has been highly praised for maintenance and use of provided equipment. Therefore, maintenance and use of equipment that is granted in this project can correspond well with the Philippines government and NMP.
- Educational and training equipment that was donated by projects that JICA has executed in the past were damaged by the typhoon Yolanda. Recovery by NMP or the local government or the Philippine government is very difficult. In terms of continuity with past projects, assistance to the subject facility is required.
- The competency standards of seafarers are sophisticated and are presented in the STCW Convention and the like. Therefore, it is necessary to use the latest equipment for education and training of seafarers. Under all the grant aid of JICA there is no possibility of causing particular difficulties in the implementation of the project.
- There have been numerous training institutions in the vicinity of Manila that can be certificated in various international conventions. However, education and training institutions that reach the world standards are very few in Mindanao and Visayas regions in which NMP has been established. Thus, by enhancing the educational equipment of NMP by this project, NMP can provide the necessary qualifications for graduates of the maritime school and seafarers of Visayas region.
- The percentages of Hometowns of trainees in NMP are as follows. (Eastern Visayas 50%, Central Visayas, 35% Mindanao 15%). Since there are no advanced training institutions to replace NMP in these areas, it is necessary that the NMP continue education and training at the current location.



### 3-3-5-2 Effectiveness

#### (1) Quantitative Effect

- Many of the 9,000 trainees per year come from Eastern Visayas, Central Visayas, and Mindanao. There are no Training Institutions in this region that have training facilities and dormitory equivalent to those of the NMP. The training costs at NMP are inexpensive, and it is possible that many poor young people of this region can easily obtain the certificate that is necessary to embark. Therefore, in the current situation where NMP is not functioning well, people who intend to become seafarers will not get a job as seafarers for the lack of the certificate necessary for boarding. Accordingly, when educational equipment is enhanced by this project, seafarers would be able to easily acquire the necessary certificates, then the number of seafarers will increase. As a result, remittances of foreign currency by seafarers will also increase. It is notable that on the basis of the number of seafarers in the region around NMP, when estimating the foreign currency remittances from seafarers, the total reaches about 150 billion yen<sup>1</sup> per year.
- Obtaining education and training equipment with the help of JICA, the training is enriched and the number of courses that can be carried out at the NMP is increased. An additional 4,500 trainees and an additional 16 courses are expected. Total number of the trainees from 1985 up to typhoon Yolanda is about 160,000, and issued credentials has reached about 310,000 pieces, it has played an important role in the certification of seafarers in the Philippines. However, because the education and training equipment was severely damaged by the typhoon Yolanda, the number of trainees and training courses is reduced at the present time. Therefore, seafarers that have difficulty in finding positions on board vessels are also present in large numbers.
- There were 166 full-time or part-time staff in NMP (Including 54 faculty members). Training materials were damaged by typhoon Yolanda. The government has been requested to allow a reduction in the number of staff after the typhoon to 74 people, including 25 faculty members. This project will return the education and training to its previous state and the conventional employment of faculty and staff of about 80 people is possible. (10 person reduction)

#### (2) Qualitative Effect

- In order for the Filipino seafarers to be employed by foreign shipping companies, certificates of the various training are required in addition to the seamen's competency

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<sup>1</sup> It is said that the total number of seafarers from the Philippines are 370,000 people and the number of seafarers from within the Region 8 are 11,856 people in the statistics of November 2012. Therefore, the following equations were used to simply calculate the total amount of overseas remittance of overseas working seafarers of Region 8. (Philippines whole 4,835,342,000 USD : 2012),  $4,835,342,000 \text{ USD} \div 370,000 \text{ people} \times 11,856 \text{ people} \doteq 150 \text{ billion yen}$

certificate. Since NMP is a National maritime training center , the certification which NMP issues has high credit in the foreign countries. There is no problem in PSC (Port State Control).

- Therefore, it is likely that the seafarers will be employed by foreign shipping companies if they have the credentials of training from NMP. So that it is possible to contribute to the employment of seafarers.
- Recently ocean-going vessels have been configured with multinational crews. Therefore, maritime accidents due to insufficient communication also have occurred. By performing the training corresponding to the emergency situation using various types of simulations that can simulate the operation state and condition of actual ships, it is possible to ensure the safe operation of the ship.
- JICA has been helping NMP obtain equipment for some 30 years. Meanwhile, the STCW Convention has been changed by the Manila amendments of 2010 and significant revisions to the 1995, training courses that are not be adapted to the current conventions are coming out. Equipment will be enhanced by this project, so that it is possible to ensure the training for seafarers in accordance with the latest international treaties.
- If maritime accidents occur, the lives of the crew are exposed to a dangerous state. At that time, because it requires evacuation by life raft or lifeboat, training the crew is required before boarding. In order to carry out their training, provision of equipment related to the life rafts and lifeboats are installed in a ship in accordance with the present project is required.
- A result of NMP obtaining equipment with the cooperation of JICA is that the ability of seafarers in the Philippines has improved significantly. Confidence in the JICA is very large due to this, and the restoration of equipment this time will contribute to the strengthening of the trusting relationship.

### **3-3-6 Rehabilitation of Equipment for Guiuan Marine Fisheries Development Center**

#### **3-3-6-1 Relevance**

- This center produces milkfish and has been producing other species, such as giant clam, blue swimming crab, abalone, sea cucumber, scallops, and so on. However, this activity is postponed due to the damages caused by typhoon Yolanda.
- Basically, this center is culturing those species and supplying them to the private fishing firms and fishers, and also promotes/supports establishment of a sales network as well. Accordingly, the immediate reconstruction and recovery of this Fisheries Technology Center will contribute to the further development of fishery and improvement of livelihood of the fishermen in Region VIII. There is a Rent-a-Cage project which aids fishermen in their venture for milkfish cage culture.
- Furthermore, this center has a plan to export the expensive species, such as blue swimming crab, giant clam, sea cucumber, abalone and so on, to Japan and other foreign countries. In

this point of view, it is expected that the project will contribute to further economic growth of the Philippines in the future.

- The technology for seedstock production which the center is using was a result of trainings attended by the staff at SEAFDEC Aquaculture Department in Tigbauan, Iloilo, where technical support has long been provided by the Japanese government. It is significant that the project will reactivate the local economy by recovering many years' accumulated technologies.
- Both the Philippines and Japan are equally fish-eating countries, but the biomass of the fish stock is decreasing. There is, therefore, a need not only to culture fish, but also to release fingerlings to fish sanctuaries and marine protected areas. Japan has long experience in this field. Thus Japan could play a crucial role in recovery and reconstruction efforts in the fishing industry.

### **3-3-6-2 Effectiveness**

#### **(1) Quantitative Effect**

##### **1) Increase of Fishery Production**

- When this hatchery/center restarts operations, it can produce 6.31 million fishes and other species a year. Among those products, each year 4.25 million fishes and other species can be sold to the aquaculture firms and fishers

##### **2) Secure of Livelihood for Fishermen/Fishery Firm Damaged by Typhoon**

- In Region VIII, approx. 34,000 adults are obtaining income from the fishery industry. 6% of those people, i.e. approx. 2,000 people, are working for aquaculture and 12.4% of the above, i.e. 4,200 people are working selling fishes provided by an aquaculture firm and/or fishers.
- In consideration of those people and their families, the rehabilitation and recovery of this hatchery/laboratory will contribute to secure their livelihood as well as improving their daily lives in both tangible and intangible manners in future.

#### **(2) Qualitative Effect**

##### **1) Support for Fishery Production**

- Recovery and restarting of this hatchery/center will contribute to continuity and eventually increase the production of good quality fishery products in Region 8.

## **2) Expansion of Sales Network**

- Recovery and restarting of this hatchery/center will contribute to expand the sales networks for cultured fish and other aquaculture species in Region 8.

## **3) Improvement of Livelihood for Fishermen**

- Marine products provided by this hatchery/center after early recovery and restarting will contribute to the fishers and fishing companies to restart fishing activities and regain their livelihoods. It may contribute to improving their incomes by culturing and selling new species in the future.

## **4) Strengthening of the Confident Relationship between both Countries**

- Since some of the products provided by this hatchery/center will be exported to other countries including Japan, the recovery and restarting of this center will contribute to the development and strengthening of confident relations between Japan and Philippine government.

### **3-3-7 Rehabilitation of Equipment for Tacloban Airport**

#### **3-3-7-1 Relevance**

Because all existing airport rescue and firefighting vehicles (ARFF) were destroyed by the typhoon, the international standard is not met, and there is a possibility that the rescue and firefighting of an aircraft accident, etc., will be inadequate under the current conditions with one ARFF diverted from another airport in the emergency. Considering the incident in which a Cebu Pacific Airbus 320 overran the Davao international airport in June 2013, etc., because aircraft accidents endanger the lives of many passengers, the most important facet of airport operation is safety and security. According to the international standard of aerodrome category for rescue and firefighting, prompt rescue and firefighting will reach an acceptable level through the renewal/installation by the project, of ARFF that met 6 category levels and the safety of aircraft operations will be strengthened. Because all existing security screening equipment was destroyed by the typhoon, all checks of baggage and passengers are carried out by security staff. This is not a proper security screening level and there is a possibility that acts of unlawful interference may occur. Proper security screening will be enforceable through the project's renewal/installation of essential x-ray inspection systems and walk-through metal detectors, and security for aircraft will improve. Taking the above situation into account, it is concluded through the examination of the relevance of implementation of the Project that the Project is relevant to be implemented as a Japan Grant Aid Project.

### **3-3-7-2 Effectiveness**

The following quantitative and qualitative effects will be expected as outputs of the Project.

#### **(1) Quantitative Effects**

Aviation safety for 1.4 million or more passengers per year, and 10,000 or more aircraft flights of three airlines (Philippine Airlines, Cebu Pacific, and Eyre Air Asia Zest) will be secured when Tacloban airport is used.

#### **(2) Qualitative Effects**

The safety of the Tacloban airport and air transportation increases, restoration of confidence as a base of traffic and physical distribution can be expected, and becoming a positive economic factor can all be expected.

### **3-3-8 Reconstruction of Local Government Office**

#### **3-3-8-1 Relevance**

- It is the key point to promote functional rehabilitation and recovery of local government early for carrying out the operations in addition to citizen services. By reconstructing the buildings earlier, Municipal Offices will contribute toward improving citizen services.
- By constructing the buildings which have a strong structure and high resistance to wind and having a back-up generator, the Municipal Office will contribute toward providing a shelter function as an evacuation center in East Visaya area where the typhoons frequently make landfall.
- Municipal Offices which are near the coastline will have a piloti system on the ground floor and major functional rooms on the second floor. The “Piloti System” will avoid high tide flood water and keep damage to a minimum.
- The government office, which will be constructed in compliance with those policies, may be expected to be the good model for local government buildings in the Philippines, so that it could contribute to improve the quality of buildings and facilities.
- Those are public facilities and no concerning about the profit performance.
- No environmental issues will occur since this project is only reconstruction of existing facilities.
- Japanese high quality design and construction technology can be useful for that facility construction. Furthermore, there is no difficulty to implement the project because of utilizing Japanese Grant Aid scheme.

### **3-3-8-2 Effectiveness**

#### **(1) Quantitative Effect**

##### **1) Beneficial Population**

- There are approximately 2.7 million population in total, such as 1.5 million in Marabut, 1.1 million in Lawaan, who will benefit from this project.<sup>2</sup>

#### **(2) Qualitative Effect**

##### **1) Recovery of Function of Government Offices**

Recovery of government services can contribute to the improvement of people's lives as well as the recovery of local business opportunities, and consequently can contribute to the development and safety in the area devastated by Typhoon Yolanda.

##### **2) Improvement of Maintenance Cost**

- New long-life buildings can contribute to reduce of the maintenance cost and it will be utilized for a longer time with less maintenance.

##### **3) Provision of Safe Buildings**

- The new buildings which are resilient against external forces of disaster (typhoon, earthquake, tsunami, storm surge, etc.) can contribute to developing a resilient city and areas against such disasters.
- The new facility which can be used for evacuation in emergency case can provide safe and secure circumstances in the area devastated by Typhoon Yolanda.
- The new buildings may be the symbol expressing strong relations between Japan and the Philippines and they will provide the opportunity to perpetuate the Japanese experience and lessons obtained from the past disasters.

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<sup>2</sup> Population data is quoted from each municipality as of February 2014.