

TERMS OF REFERENCE

FOR THE SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF VESSEL TRAFFIC MANAGEMENT SYSTEM (VTMS) AT THE PORTS OF ILOILO, DAVAO AND ZAMBOANGA

1. RATIONALE:

The thrust of the Philippine Ports Authority to be globally competitive through an efficient port management system has been enhanced by addressing the challenge of upgrading at least ten (10) ports to international standards. The strategies in achieving the international standard status for ports may vary from one port to another. There is, however, a common denominator; and that is the ports should be compliant with the international agreements that the country has acceded to and which apply to maritime industry. These international instruments have been formulated for the purpose of ensuring maritime navigational safety and security and the protection of the marine eco-system. Through the initiative of the International Maritime Organization (IMO), the International Convention for the Safety of Life at Sea (SOLAS) was developed and has been recognized as a major accomplishment in this area. It is noteworthy that the Philippine government ratified this Convention many years back. It is therefore incumbent upon the Philippine government, as member-state, to enforce this SOLAS Convention which spawned a wide range of codes and guidelines covering the subjects on dangerous cargoes (IMDG code), automatic identification system, port and ship security (ISPS Code), and vessel traffic services, among other things.

In support of the action taken by IMO to improve maritime safety, the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) developed the "Vessel Traffic Services Manual" for the guidance of countries that would embark on VTMS projects.

In light of the pertinent provisions spelled out in SOLAS Convention and by virtue of Presidential Decree No. 857, otherwise known as the revised Charter of the Philippine Ports Authority, which mandated PPA, among others:

"To coordinate, streamline, improve and optimize the planning, development, financing, construction, maintenance and operation of Ports, port facilities, port physical plants, and all equipment used in connection with the operation of a Port."

The Philippine Ports Authority (PPA) installed and has continuously operated the Vessel Traffic Management System (VTMS) in two (2) major ports (the Port of Manila and the Port of Batangas) in the Philippines, in order to ensure safe navigation for all vessels entering into and departing from both harbors including its channels.

The installation of the VTMS in Manila was completed and remained in operation from October 2005, while the VTMS at the Port of Batangas was completed and remained in operation from February 2008.

PPA intends to expand the installation of VTMS in selected Ports nationwide and shall be interconnected and monitored on the existing Central Monitoring and Information System (CMIS) located at the PPA Head Office in Manila.

PPA shall establish and operate VTMS to include a three (3) year extended warranty period with a five (5) year maintenance services in the following ports:

1. Davao
2. Iloilo and
3. Zamboanga

2. GENERAL OBJECTIVES:

The objectives of installing and operating a VTMS at the above-mentioned ports are:

- 2.1 To comply with the SOLAS Convention;
- 2.2 To improve the safety and efficiency of vessel traffic and reduce the risk of vessel traffic accidents in the harbors and approaches;
- 2.3 To protect the marine environment;
- 2.4 To enhance the enforcement of port and harbor regulations;
- 2.5 To provide essential navigational information and assistance to vessels; and
- 2.6 To serve as exchange and source of information for the port and maritime industries especially in emergencies or during search and rescue operations conducted by the Philippine Coast Guard.

3. GENERAL DESCRIPTION OF THE PROJECT

The project which will be implemented simultaneously in the herein mentioned ports, is a package that consists of procurement of equipment and supply, including system installations, adjustment and testing, training and the construction of the control center. It will include the interconnection to the existing CMIS located at the PPA Head Office in Manila. It will also include the three (3) years extended warranty period with five (5) years maintenance services. Various sensors, communication and navigational equipment are the major components that shall be installed in VTMS. In particular, the system shall conform with the latest IALA Recommendation on Operational and Technical Performance of VTS Systems and shall be capable of:

- a. Detecting, monitoring, and communicating and coordinating with all vessel within the VTMS coverage areas, determining their position and velocity vectors, and identifying the characteristics of the environment that surrounds them; and
- b. Interacting with the traffic and responding to the request of vessels, any emergencies and traffic situations developing in the VTMS coverage areas.

- c. Interconnecting and monitoring on the existing CMIS located at the PPA Head Office in Manila.

Compatibility in the operational standard of the above mentioned VTMS with the existing PPA VTMS (Manila & Batangas) and the CMIS in terms of major equipment and software and especially the common use of spare parts applicable for all PPA VTMS is an advantage and PPA is taking into consideration.

It is expected that the system will be operational 24 hours per day 7 days a week throughout its ten (10) year life span. VTMS Control Centers, which will likewise serve as radar stations, will be located separately within the premises of the three (3) ports and will be constructed in strategic areas taking into consideration the wide and optimum coverage of sensitive navigational waterways including the desired targets and the approaches to the port.

The design of the VTMS Control Center building, the required equipment and specifications and the system configuration shall be common to all subject ports.

4. SCOPE OF WORK

- 4.1 Conduct of a separate study and review by the interested or participating bidder to validate the requirements of the project and to augment the same as appropriate subject to the approval of PPA.
- 4.2 Design and construction of control center in each of the ports under consideration. Locations of the control center shall be specified by PPA and shall be at a location within the port area which will not be affected by any future development in the ports.
- 4.3 Validation of boreholes or soil bearing capacity for purposes of pile driving which shall be provided by PPA.
- 4.4 Interconnection between the VTMS Control Centers and the Control Monitoring and Information System (CMIS) at the PPA Head Office. The contractor shall guarantee the compatibility of hardware and software in the interconnection with the CMIS that shall not affect and disrupt the operation.
- 4.5 Supply a system that can detect, plot and track vessels and stationary objects like shore lines and navigational aids. It must have user friendly displays, which show the detected objects on the background of an electronic chart, known as Electronic Navigational Chart (ENC), approved by the NAMRIA, which shall be state of the art.
- 4.6 Installation of consoles with at least, but not limited to, the following functional capabilities:

- 4.6.1 Accept data from the sensors and integrate it to enhance detection of vessels and stationary objects
 - 4.6.2 Accept information from the data bases and integrate it with that of the vessel position information on the traffic display
 - 4.6.3 Provide data about vessel movements to appropriate data bases
 - 4.6.4 Capable of monitoring all the controlled functions and forward designated results to the display
- 4.7 Provision of traffic displays with menu-oriented access for the operator and shall use windows for the detailed display of all functions. The main windows shall have the following features and capabilities:
 - 4.7.1 Access control to operator controllable data handling functions
 - 4.7.2 Choice of currently monitored functions
 - 4.7.3 System window: General system status information, sensor status
 - 4.7.4 Traffic situation window: charts, plots, tracks, sectors, fairways, anchor areas, coastlines, outlines of shoals, navigational aids, alert zones
 - 4.7.5 Target identification, traffic situation alerts (collision avoidance, SAR applications, etc.)
 - 4.7.6 System/Equipment alert window: at least three levels
 - 4.7.7 Operator window: to facilitate communication for the operator, such as sending and receiving messages relevant to his work
 - 4.7.8 Data handling
 - 4.7.9 AIS messages (receive and transmit)
 - 4.7.10 Alarms for lost target, equipment failure and others (warning line, speed limit, anchor watch etc.)
 - 4.7.11 Tagging of radar target
- 4.8 Installation of LAN network components for the control center.
- 4.9 Provision of traffic display that is selectable by the operator as to the type, manner and combination of information for display and that includes, but need not be limited to, the following:
 - 4.9.1 Plots
 - 4.9.2 Tracks with course vectors and labels
 - 4.9.3 Range and sector markers
 - 4.9.4 Charts (Electronic Navigational Chart)
 - 4.9.5 Capability to zoom and off-center to maximum range
 - 4.9.6 Measurement of distance and bearing between any two points in the position sensor coverage area (Electronic bearing line / variable range marker)
 - 4.9.7 Closest Point of Approach (CPA) and Time to Closest Point of Approach (TCPA) for vessels and any point or line and vessel. Warnings (visual, audible and other electronic alert) of critical values of CPA and TCPA

- 4.9.8 Guard lines and circles, warnings and alarms when a vessel crosses these marked boundaries (visual, audible and other electronic alert)
- 4.10 Supply, installation, test and commissioning, and setting to work of the following equipment and systems including the components and subsystems thereof in accordance to the specifications of the manufacturers and existing standards and regulations:
 - 4.10.1 RADAR and Radar Data Processing system
 - 4.10.2 Automatic Identification System (AIS)
 - 4.10.3 VHF Communication System
 - 4.10.4 Database System
 - 4.10.5 Closed Circuit TV (CCTV) System
 - 4.10.6 Multi-sensor Integrated Processor
 - 4.10.7 Recording and playback Processor
- 4.11 Supply of a system that has automated functions which include the calculations of Closest Point of Approach (CPA) and Time to CPA (TCPA) and warnings of potential collisions as well as course deviations from shipping lanes and proximity to danger zones. The warning from the system to the controller must be timely and concise, i.e. alarm is automatically activated if CPA is 0.2 nautical miles and 5 minutes for TCPA.
- 4.12 Provision of the traffic display using symbols that conform to IMO recommendations, with the addition of other symbols to convey to the operator required information.
- 4.13 Application of redundancy concept for the following equipment/installations:
 - 4.13.1 VTMS LAN
 - 4.13.2 Radar transceivers/transmitters
- 4.14 Organize and conduct of the training program for operators and VTMS technical personnel of PPA. The training courses shall be conducted separately at the respective areas of the concerned ports. Planning of training shall be done in coordination with PPA designated Project Manager for VTMS Project for a period of approximately ten (10) days. The hands-on training shall be conducted within the training course with the assistance of the technical personnel of the winning bidder. The content of training module shall include but not limited to the following:
 - 4.14.1 Basic physics of radar
 - 4.14.2 Basic concept and operation of radar
 - 4.14.3 Knowledge, understanding and operation of all components and controls of the system.
 - 4.14.4 Preventive Maintenance and Basic Troubleshooting and Repair

4.15 Conduct of Site Acceptance Test (SAT) with concerned PMOs, shall be done separately in the following:

- a. Port of Iloilo
- b. Port of Davao
- c. Port of Zamboanga

5. APPROVED BUDGET FOR THE CONTRACT

The Approved Budget for the Contract is Seven Hundred Million Pesos (Php700,000,000.00)

6. RESPONSIBILITY OF THE WINNING BIDDER

The winning bidder shall be responsible for:

- 6.1 The supply, transport, delivery, installation, starting-up, operationalization, commissioning of brand-new equipment and software components for the entire system.
- 6.2 The availability of radar system spare parts during the 10 year life;
- 6.3 Guaranteeing that all software and hardware have been tested and inspected prior to their delivery;
- 6.4 Guaranteeing that all major equipment (i.e., radar antenna, radar data processors, radar transmitter-receiver, AIS, and VHF Communication System) have a life expectancy of ten (10) years and shall be covered by an extended warranty period of three (3) years. After the turnover of equipment and facilities, qualified technical personnel shall be on standby and shall be ready to attend to technical problems that may occur within the warranty period;
- 6.5 Guaranteeing that the components are standard state-of-the-art equipment and have been proven as successful operation in local or foreign ports;
- 6.6 Supply of Operator's and Service Manuals, in print and soft copy versions (PDF searchable);
- 6.7 Securing and payment of the necessary import permits/clearances issued by the National Telecommunication Commission (NTC), Local Government Units and other government agencies. However, securing and payment of NTC Permit to purchase, use of frequency and Radio Station license shall be under scope of work of PPA.
- 6.8 Payment of all taxes, import duties, port dues and other charges;

- 6.9 Providing the manufacturer's operational and maintenance manuals for COTS components and subsystems.
 - 6.10 Supply of equipment rack and furniture (tables, chairs) for the operator's and database workstations and other VTMS monitoring equipment.
 - 6.11 Ensuring that all operator-oriented documentations, manuals and all information displayed on the screen, including symbols, menus etc. shall be in the English language, using standard IMO symbols;
 - 6.12 Ensuring that human interface of the system shall be designed using the related IMO standards and recommendations particularly for operational procedures and symbology.
 - 6.13 Providing three (3) year extended warranty period with a five (5) year maintenance period.
 - 6.14 Detailed cost estimates, construction methodology, material cost and specifications shall be provided by the winning bidder.
 - 6.15 Initial supply of maintenance tools and testing equipment (i.e. multi-tester)
 - 6.16 Supply spare parts or components shall as promptly as possible, but in any case, within two (2) months of placing the order.
- 7. OPERATIONAL AND FUNCTIONAL REQUIREMENTS, DESCRIPTIONS AND SPECIFICATIONS OF THE EQUIPMENT FOR THE PPA VTMS SYSTEMS:**

7.1 Equipment Requirement

Vessel Traffic Management system shall compose of the following:

	Particular	VTMS Iloilo	VTMS Davao	VTMS Zamboanga
1. VTMS Control Center and Radar Station				
1.1	18 feet X-band Radar Antenna (Circular Polarization)	1 set	1 set	1 set
1.2	X-band Solid-State Radar Transmitter-Receiver (Dual)	1 set	1 set	1 set
1.3	Radar Data Processor (RDP)	1 set	1 set	1 set
1.4	Service Display	1 set	1 set	1 set
1.5	Multi-sensor Integrated Processor	1 set	1 set	1 set
1.6	Multi-Function Console	2 sets	2 sets	2 sets
1.7	Large Display Console	1 set	1 set	1 set
1.8	Recording and playback processor (record/replay)	1 set	1 set	1 set

1.9	Database Server (Redundant)	1 set	1 set	1 set
1.10	Data Base Terminal	1 set	1 set	1 set
1.11	VTMS Data Server	1 set	1 set	1 set
1.12	Resource Management Server	1 set	1 set	1 set
1.13	Automatic Identification System (AIS) Base Station Dual Transponder	1 set	1 set	1 set
1.14	VHF Transceiver	2 sets	2 sets	2 sets
1.15	VHF Controller	2 sets	2 sets	2 sets
1.16	VHF Server	1 set	1 set	1 set
1.17	CCTV Camera	1 set	1 set	1 set
1.18	Network Video recorder	1 set	1 set	1 set
1.19	CCTV Monitor Display	1 set	1 set	1 set
1.20	Meteorological Sensor	1 set	1 set	1 set
1.21	Meteorological Monitoring	1 set	1 set	1 set
1.22	Inkjet Printer	1 set	1 set	1 set
1.23	Large Display	2 sets	2 sets	2 sets
1.24	Uninterruptible Power Supply	1 lot	1 lot	1 lot
1.25	Fast Ethernet Switch	1 lot	1 lot	1 lot
1.26	IP VPN ROUTER/FIREWALL	1 set	1 set	1 set
1.27	VOIP Telephone	1 set	1 set	1 set
1.28	Diesel Engine Generator	1 lot	1 lot	1 lot
2. Office of the Port Manager				
2-1	Large Display Console	1 set	1 set	1 set
2-2	Large Display	1 set	1 set	1 set
2-3	UPS	1 set	1 set	1 set
2-4	VOIP Telephone	1 set	1 set	1 set
2-5	Fast Ethernet switch	1 lot	1 lot	1 lot
2-6	Communication link to VTMSCC	1 lot	1 lot	1 lot

3. PPA Head Office CMIS

Item	Particular	Quantity
3-1	3 x 2 Video Wall	1 lot
3-2	Video Wall Controller	1 set
3-3	VOIP Converter for VHF Radio	12 sets
3-4	Additional monitor 24 inches	2 sets

7.2 Equipment Descriptions and Specifications

7.2.1 18 ft. X-Band Radar Antenna

X-band radar antenna of the radar site shall be a slotted array type and comprised of the radiator section that radiates the electric radar waves and the pedestal that rotates the system. An encoder should be incorporated in the pedestal in order to synchronize the rotation of the radar image and to produce azimuth signal that indicate the direction of radiation.

7.2.1.1 Specifications

Type	:18 feet slotted array
Frequency band	:9,400 \pm 50MHz
Rotation Speed	:20rpm
Polarization	:Circular
Gain	:34dB \pm 1dB (Typical)
Bearing Generation	:Incremental encoder
Wind Velocity	
Operational	:40 m/s for continuous
Survival	:60 m/s for continuous
Driving Motor	AC 220V(100V), 50Hz, 3 ϕ

7.2.2 Radar Transmitter-Receiver (Dual Solid-State X-Band)

Two (2) sets of TRX shall be supplied to provide redundant operation and to maintain continuous operation of the system without being affected even by failure occurrence in one channel. Each TRX should be switchable to the antenna or dummy load by a wave guide switch.

The TRX shall consist of Solid-State Power Amplifier (SSPA), microwave component circuit, transmitter-receiver circuit, IF input/output circuit, signal processing circuit, interface circuit and power supply circuit.

A total of one (1) set Dual-state X-Band Radar Transmitter-Receiver shall be installed in each VTMS Control Center of each port

7.2.2.1 Main Functions

- Generate, transmit, and receive 9GHz microwave waveform (electromagnetic pulse) from and to the radar antenna
- Produce raw radar images and sends the images to the Radar Data Processor

7.2.2.2 Design Features

- Shall have two (2) Radar Transmitter and Receiver for redundancy.
- Shall be a Solid state transmitter design to provide high reliability and reduce maintenance, low power consumption
- Shall have low power transmission

7.2.2.3 Specifications

- Mechanical layout: Rack Mount or Wall Mount/Tower Mount
- Transmitting frequency: 9GHz band (PON: 9410MHz, QON9440MHz)

- c) Transmitter power: 200W+1dB, -3dB
- d) Pulse Width:
 - : 0.16 μ s – 0.30 μ s (N on-Chirp: for short range)
 - : 4.5 μ s – 18.3 μ s (Chirp: for long range)
- e) Transmission pulse width/pulse repetition frequency (PRF): 2280Hz – 1280Hz
- f) Transmitter: Solid-state power amplifier
- g) Video processing function: Interference rejection, Constant False Alarm Rate (CFAR), Coherent Integration
- h) Output signal: Radar video and trigger (LAN)
- i) Power Supply: DC48V \pm 10%
- j) Waveguide Switch: Installed inside
- k) Radar Control/Monitoring: LAN Interface/serial interface (for maintenance)
- l) Solid state radar transceivers have life expectancy of 10 years.

7.2.3 Radar Data Processor

Radar Data Processor shall consist of multiple units Image Server/Tracker. The radar interface unit shall receive the control data via data communication link system from the VTS Operation Display in the control center and controls operations of the radar equipment such as radar antenna, transmitter-receiver, waveguide changeover, etc. The image server/tracker shall provide the function of suppression of noise, sea-rain clutters, and also target extraction function from radar video for the tracking. The processed radar video signal shall be outputted to the radar image server process. The extracted target data (plot) is then the output to the tracking and various alarm processing. The tracker process shall provide the function of automatic tracking, based on extracted target data, tracked target data such as position, speed, course, alarm condition, etc. are output to multi-sensor integrated processor in control center through data communication link. The radar image server shall include the radar video input unit that converts the radar video signal from analogue to digital in real time and stores this in the memory. It shall perform data compression of the radar video data stored in the memory and transmits them to each display in the control center and monitor sire via data communication link such as wired or wireless LAN system.

7.2.3.1 Main Functions:

- a) High video bandwidth processing
- b) Supreme resolution in range and azimuth raw radar video processing with precise amplitude resolution

- c) Correlation in range, azimuth and time, for improved detection performance
- d) Plot extracting for Target Tracking
- e) Automatic tracking function
- f) Receiver blanking to eliminate undesired land clutter
- g) Land masking function for undesired tracking area
- h) Power Control of Transmitter-Receiver and radar antenna

7.2.3.2 Specifications

- a) Factory type computer
- b) Operating System: Windows 10 64bit or better
- c) Processor: 3.40GHz, 6MB Cache, 2400MHz or better
- d) Memory: 8GB or better

7.2.4 Service Display

The service display shall display the radar image and radar-control operation for maintaining a radar antenna, radar transmitter-receiver and radar data processor in the radar site.

7.2.4.1 Main Functions

- a) Set-up and configuration of local radar system
- b) Maintenance console

7.2.4.2 Design Features

- a) Electronic Navigational Chart (ENC): Official sea chart digitized by the supplier and approved by the National Mapping Resources and Information Authority (NAMRIA), IMO-IHO Standard S.57/S63 (ENC)
- b) The display provides the overview of the complete surveillance of the radar station covered area.
- c) Zoom: With zoom in-zoom out support

7.2.4.3 Specification (Minimum)

- a) Operating System: Windows 10 Pro for Workstations (64bit) or better
- b) Processor: 3.6GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (RAID 1) or better
- e) Standard components: Keyboard, mouse, Optical drive or better
- f) Display: One (1) 24 inch widescreen LED display

7.2.5 Multi-sensor Integrated Processor

The multi-sensor integrated processor shall receive the tracked target data and AIS target data from the remote sensor station, converting the coordinates of radar site into system coordinates, correlating among radar track data and AIS track data to unify tracking data and smoothing the position, speed, course, and so on of the unified tracked data.

The radar interface unit shall receive the control data via data communication link system from the VTS Operation Display in the control center and controls operations of the radar equipment such as radar antenna, transmitter-receiver, waveguide changeover, etc.

7.2.5.1 Main Functions

- a) Central track management with multi-sensor track fusion for radar and AIS tracks
- b) Comprehensive track monitoring on area surveillance, collision assessment and speed monitoring and with recording and playback processor
- c) Central diagnostic functions from system status and fault localization

7.2.5.2 Design Features

- a) High speed operating system
- b) Traffic handling capacity: 2000 targets at any one time
- c) Standardized interfaces for system-wide communication
- d) Hardware components are of commercial high standard

7.2.5.3 Specifications

- a) Operating System: Windows 10 Pro for Workstations (64bit) or better
- b) Processor: 3.6GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (RAID 1) or better
- e) Standard components: Keyboard, mouse, Optical drive
- f) Display: One (1) 24 inch widescreen LED display

7.2.6 Multi-Function Console (VTMS Operator Console)

The Multi-Function console shall be the use as the main user interface to VTMS and shall consist of 3 sets traffic display monitor. The traffic display shall display the radar raw image,

radar tracking target, AIS target from tracking system, and indicates them with electronic chart on color display. They also called VTMS Operator Console

7.2.6.1 Main Functions

- a) Main user interface of the operator to the VTMS
- b) Main user interface to the VTMS for the operator or VTMS Supervisor
- c) Control and monitor VTMS equipment such as radar, and CCTV
- d) Monitor Display radar and AIS targets, meteorological data and CCTV
- e) Also known as VTMS Operator Console

7.2.6.2 Design Features

- a) Electronic Navigational Chart (ENC): Official sea chart digitized by the supplier and approved by the national Mapping Resources and Information Authority (NAMRIA), IMO-IHO Standard S.57/S.63 (ENC)
- b) Display shall provide the overview of the complete surveillance on VTMS covered areas of the subject ports
- c) Operator shall select color and shading under ergonomics considerations
- d) The Operator shall be able to edit, except the ENC, existing symbols and add an almost 300 of new symbols
- e) Chart related Objects: Possibility to display objects based on S.57.
- f) Zoom: With zoom in-zoom out support
- g) Speed vectors: Operator shall select tracks for showing the speed vectors and measured course
- h) Speed monitoring: The system shall be capable of monitoring track speed. A warning shall be displayed if a vessel violates speed limit.
- i) Closest Point of Approach (CPA): CPA (0.2 nautical miles) shall be shown and the Time (5 minutes) to reach CPA (TCPA) of two tracks or one track and any fixed point which will be subject to change.
- j) Display item:
 - Radar raw video, radar tracked target,
 - AIS target, Radar/AIS integrated target,
 - Electronic chart, Tracking area, Alarm area,
 - Range mark, L/L line, EBL/VRM, System data
 - Operation menu, Radar control window,

7.2.6.3 Specifications

- a) Operating System: Windows 10 Pro for workstations (64bit) or better
- b) Processor: 3.6GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (RAID 1) or better
- e) Standard components: Keyboard, mouse, Optical drive
- f) Display: Three (3) 24 inch widescreen LED display

7.2.7 Large Display Console

The Large Display Console shall have the same function of Multi-Function Console and shall serve as the back-up operator console. This shall be used by VTMS operator supervisor for traffic without interrupting the VTMS operator. VTMS traffic display shall also be viewed on the large display.

Large Display Console shall be installed also at PPA Port Manager Office to monitor the VTMS traffic.

7.2.7.1 Main Functions (same as Multi-Function Console)

- a) Back-up console for VTMS multi-function console
- b) Main user interface to the VTMS for the operator or VTMS Supervisor
- c) Control and monitor VTMS equipment such as radar, and CCTV
- d) Monitor Display radar and AIS targets, meteorological data and CCTV

7.2.7.2 Design Features

- a) Electronic Navigational Chart (ENC): Official sea chart digitized by the supplier and approved by the National Mapping Resources and Information Authority (NAMRIA), IMO-IHO Standard S.57/S.63 (ENC)
- b) Display shall provide the overview of the complete surveillance on VTMS covered areas of the subject ports
- c) Operator shall select color and shading under ergonomics considerations
- d) The Operator shall be able to edit, except the ENC, existing symbols and add an almost 300 of new symbols
- e) Chart related Objects: Possibility to display objects based on S.57.
- f) Zoom: With zoom in-zoom out support
- g) Speed vectors: Operator shall select tracks for showing the speed vectors and measured course

- h) Speed monitoring: The system shall be capable of monitoring track speed. A warning shall be displayed if a vessel violates speed limit.
- i) Closest Point of Approach (CPA): CPA (0.2 nautical miles) shall be shown and the Time (5 minutes) to reach CPA (TCPA) of two tracks or one track and any fixed point which will be subject to change.

7.2.7.3 Specifications

- a) Operating System: Windows 10 Pro for workstations (64bit) or better
- b) Processor: 3.6GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (RAID 1) or better
- e) Standard components: Keyboard, mouse, Optical drive
- f) Display: One (1) 24 inch widescreen LED display
- g) Extended display to One (1) 55 inch widescreen LED Display

7.2.8 Recording and playback processor (record/replay)

Recording and playback processor shall record the vessel movements monitored by radar, AIS. It shall also record the VHF voice communications exchange between vessels and VTS operator. It shall a function the playback the recorded data.

7.2.8.1 Main Functions

- a) Records and playback track target data (radar and/or AIS)
- b) Records and playback VHF voice communications audio data
- c) Operation Log
- d) Can be recorded to a specific date and time in a media device and be able to playback in a unique multimedia player (where the saved data format can only be played)

7.2.8.2 Design Features

- a) Fully synchronous multimedia data logging including radar images, track data, track alarms, VHF voice communication, remote sensors data and system alarms.
- b) Full radar recording with total operational range independent from operator console.
- c) The data to be recorded as follows.
 - i. Display screen image of MFC (multi-function console)

- ii. Radar/AIS tracked target
- iii. AIS transmitting and receiving message
- iv. Warning information
- v. Operation on all multi-function consoles
- vi. VHF communication voice, etc.
- d) Archiving for five (5) year worth of data to external HDD

7.2.8.3 Specifications

- a) Operating System: Windows 10 Pro for Workstations (64bit) or better
- b) Processor: 3.6GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (RAID 1) or better
- e) Standard components: Keyboard, mouse, Optical drive
- f) Display: One (1) 24 inch widescreen LED display

7.2.9 Database Server

7.2.9.1 Main Functions

- a) Store vessel information, voyage related information i.e., Estimated Time of Arrival (ETA), Estimated Time of Departure (ETD), Actual Time of Arrival (ATA), Actual time of Departure (ATD), and other ship movement
- b) Port facilities management, berth management, pilot management
- c) Reporting statistics

7.2.9.2 Design Features

- a) Redundant configuration for a robust database system
- b) Shall be compatible to the existing upgraded database system of VTMS MANILA and VTMS Batangas
- c) Shall be compatible to the existing VTMS Central database server at PPA CMIS VTMS monitoring at PPA Head Office.
- d) Shall exchange and synchronize data to VTMS Central database server at PPA CMIS VTMS monitoring at PPA Head Office.

7.2.9.3 Specifications

- a) 4th Gen or the latest generation of processors
- b) Operating System: Windows Server 2019 or latest version
- c) Memory: 16GB or more
- d) Storage: 1TB or more, RAID1 or better

- e) Standard components: Keyboard, mouse, Optical drive

7.2.10 Database Terminal

7.2.10.1 Main Functions

- a) Shall provide with user interface to view vessel data, view existing vessel data and search for a vessel, by vessel name, call-sign or country. The search criteria will allow the use of wildcards
- b) Extended vessel detailed identification using own or imported ship data bases, e.g. Lloyds
- c) View traffic scheduling (ship's arrival and departure, ETA and ETD) and reporting
- d) View Destination: Port, anchorage or berth area, cargo and passenger information (cargo and passenger manifests)
- e) View Hazardous goods (IMDG) coding
- f) Encode (Add/Edit/Update) vessels information and voyage related activities
- g) Oracle System (latest version)
- h) Searching function for anchorage, berth and historical data

7.2.10.2 Design Features

- a) Easy to understand user interface
- b) Compatible with the existing upgraded database of VTMS Manila and Batangas
- c) Compatible and can be integrated with iPORTS
- d) Can generate Statistical Reports and other reporting format to be determined by PPA

7.2.10.3 Specifications

- a) Operating System: Windows 10 Pro for Workstations (64bit) or better
- b) Processor: 3.6GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (RAID 1) or better
- e) Standard components: Keyboard, mouse, Optical drive
- f) Display: One (1) 24 inch widescreen LED display

7.2.11 VTMS Data Server

7.2.11.1 Main Function

- a) Forward the Radar and AIS target data from Multi-sensor integrated Processor (MIP) to VTMS Central Server

7.2.11.2 Design Features

- a) Must be compatible and able to communicate with the existing VTMS Data Server at PPA CMIS

7.2.11.3 Specifications

- a) Operating System: Windows 10 Pro for Workstations (64bit) or better
- b) Processor: 3.6GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (RAID 1) or better
- e) Standard components: Keyboard, mouse, Optical drive
- f) Display: One (1) 24 inch widescreen LED display

7.2.12 Resource Management System

Resource Management System (RMS) shall be provided to remotely monitor the operational condition each equipment of VTMS system. The operational status of equipment shall be continuously monitored and recorded to detect fault of equipment and VTMS system for ease of maintenance.

The Resource management System shall monitor the status of connectivity of all equipment and network devices of the VTMS system.

7.2.12.1 Main Functions

- a) Monitor network status connection of all VTMS network equipment
- b) Provides the Monitoring of VTMS equipment such as radar, VHF radio, AIS System, CCTV system
- c) Shall provide the logging function such as operation log, event log and trace log

7.2.12.2 Specifications

- a) Operating System: Windows 10 Pro for Workstations (64bit) or better
- b) Processor: 3.6GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (RAID 1) or better
- e) Standard components: Keyboard, mouse, Optical drive
- f) Display: One (1) 24 inch widescreen LED display

7.2.13 Automatic Identification System (AIS) Base Station System Dual Transponder

The information supplied by the AIS transponder installed on ships shall be displayed on the traffic displays at the Operators' Console in graphical and text form for automatic identification of such ships.

7.2.13.1 Main Functions

- a) Automatically receives AIS information from AIS-equipped vessels
- b) Transmits messages, AIS Base station identification and position to all AIS equipped vessels
- c) Interfaces with the Multi-sensor integrated processor

7.2.13.2 Design Features

- a) Provided with two (2) transponders and one (1) base station which are housed in one (1) unit
- b) Fully automatic and broadcast capable.
- c) Fully integrated into the VTMS.
- d) Able to display on the monitor the name of the vessel and speed.
- e) Hot Standby with redundancy control
- f) Includes VHF antenna, GPS Antenna, Coaxial arrester and Coaxial cables.
- g) IP Based
- h) Rack mount

7.2.13.3 Specifications (minimum)

- a) with dual transponder
- b) Hot standby, redundancy control
- c) Frequencies: 156.025 to 162.025MHz
- d) Default Channels
 - AIS1: CH87B (181.975 MHz)
 - AIS2: CH88B (182.025 MHz)
- e) Type of emission: F1D
- f) Type of Modulation: GMSK, 9600bps
- g) Output Power: 12.5W2W \pm 20%
- h) Sensitivity: 20% PER for -107dBm(25kHz)
- i) Connectivity: Ethernet
- j) Includes one set of VHF antenna, GPS Antenna, Coaxial arrester, duplexer and Coaxial cables and connectors per AIS Transponder

7.2.14 VHF Transceiver (Base Station)

VHF transceivers for the VHF communication system shall be the communication medium between the VTMS and the vessels within the coverage area and shall operate on the international Maritime Channels. The VTMS operator shall be able to switch to any desired operating channel from a CHF controller using a

remote-control panel. The microprocessor-controlled frequency synthesizer allows each multi-channel transceiver to select any desired channel frequency.

The VHF Transceiver shall be remotely operated via software from the VHF controller. VHF Transceiver shall consist of transceiver, duplexer, arrester and antenna.

Two (2) sets of VHF Transceiver shall be install on each port or VTMS center.

7.2.14.1 Main Functions

- a) Voice communications to vessels in the VHF Marine Band

7.2.14.2 Design Features

- a) Full remote control of all transceiver functions
- b) Full multi-channel capabilities based on ITU-R M. 1084-4
- c) Design to be installed in Coast Station for the radio communication in accordance with Radio Regulations recommended by the ITU.
- d) Shall operate on international maritime channel
- e) Includes antenna, Coaxial arrester, duplexer and Coaxial cables
- f) IP Based
- g) Rack mount

7.2.14.3 Specifications

- a) Design to be installed in Coast Station for the radio communication in accordance to Radio Regulations recommended by the ITU.
- b) Output Power: 50W+10%
- c) Frequency Range: 156Mhz – 163 MHz
- d) No. of Private Channels: 6CH
- e) Antenna Impedance: 50 ohms
- f) Type of Emission: G3E (F3E-at 6dB / Octave pre-emphasis)
- g) Transmitter Frequency Oscillation: PLL frequency Synthesized
- h) Transmitter Frequency Tolerance: Within $\pm 1 \times 10^{-6}$
- i) Transmitter Distortion: 3% or less
- j) Receiver Distortion: 5% or less
- k) Receiving System: Double Super heterodyne
- l) Receiver Local Oscillation: PLL frequency Synthesized
- m) External AF output impedance: 600 ohms
- n) Power Supply: 85-264VAC, 50/60Hz

- o) Includes antenna, Coaxial arrester, duplexer and Coaxial cables and connectors

7.2.15 VHF Controller and CHF Server

The VHF Controller or VHF Operator Console shall be the operation control software for VHF communication. The VHF communication. The VHF Controller remotely controls the VHF transceiver with the TCP/IP interface through the Ethernet and adopts the VoIP technology for VHF communication. Therefore, the VHF Controller shall be able to easily connect to the VHF system. Headset and Footswitch are included in the VHF Controller (or wireless Bluetooth Headset, Wireless Microphone)

The VHF Controller operates the VHF transceiver with the VHF Server. The VHF Server is management software for the VHF communication system.

7.2.15.1 Main Functions

- a) Simple VHF transceiver control
- b) Receiving voice level indication
- c) Monitor setting function of receiving voice sound
- d) Alarm notification

7.2.15.2 Design Features

- a) Select Communication channel
- b) Turn on and off squelch function and adjust squelch level
- c) Display receiving voice level of all VHF transceiver
- d) Select monitoring device from the speaker and/or the headset. Mute the monitoring sound individually
- e) Notify the alarm condition of the VHF transceiver immediately by alarm indication and alarm sound
- f) Display the detail condition of the VHF transceiver
- g) Display VHF transceiver channel used by another operator

7.2.15.3 Specification for VHF Controller and VHF Server

- a) Operating System: Windows 10 Pro for Workstations (64bit) or better
- b) Processor: 3.6GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (Raid 1) or better
- e) Standard components: keyboard, mouse, Optical drive, One (1) Headset, One (1) Footswitch, One (1) Speaker

- f) Display: One (1) 15.6 inch LED touch display for VHF Controller
- g) Display: One (1) 24 inch widescreen LED display for VHF Server

7.2.16 Closed Circuit Television (CCTV)

7.2.16.1 Main Function

- a) View vessels for visual confirmation of targets
- b) Interface to Multi-sensor integrate Processor
- c) Shall be able to control on the Multi-functional Console or VTMS operator console / CCTV Display

7.2.16.2 Design Features

- a) Pan / Tilt / Zoom controls
- b) Full-HD 1920x1080 60fps
- c) Auto-focus features
- d) Water proof enclosure IP68 or latest
- e) Color night vision (0.001 to 0.015 lx)
- f) Remote control from VTMS Control Center

7.2.16.3 Specifications (minimum)

- a) Installation: Outdoor, waterproof housing, meets IP66
- b) Water and Dust Resistance: IP66
- c) Image Sensor: approximately 1/2.8 MOS
- d) Resolution: 2 mega pixel [16:9] (30/60 fps)
- e) Panning Range: Endless
- f) Tilt Range: -15°-195° (level-downward-level)
- g) Zoom Ratio: 36x optical or higher
- h) Operating Temperature: -50°C to +60°C
- i) Network Connectivity: 10Base-T / 100 Base-TX, RJ45 connector

7.2.16.4 Network Video Recorder shall be install to record the video images of the CCTV

- a) 30 Days retention with the following configuration:
(Encoding compression: H.265, FPS:30, Quality: Fine Quality, Resolution: Full HD/2MP/1080p/60fps)

7.2.17 CCTV Monitor

7.2.17.1 Main Functions

- a) Display CCTV Image
- b) Remote control of CCTV Camera
- c) Configuration/Maintenance of CCTV System

7.2.17.2 Specifications (minimum)

- a) Operating System: Windows 10 Pro for Workstations (64bit) or better
- b) Processor: 3.8GHz, 4core, 8.25MB, 2666MHz or better
- c) Memory: 16GB or better
- d) Storage: 1TB HDD (Raid 1) or better
- e) Standard components: keyboard, mouse, Optical drive
- f) Display: One (1) 24 inch LED touch display

7.2.18 Meteorological Sensors

The meteorological sensor shall detect the local meteorological condition at site and shall be display at the VTMS control center.

7.2.18.1 Main Functions

- a) Gather meteorological data
- b) Wind Speed
- c) Wind Direction
- d) Barometric Pressure
- e) Air Temperature
- f) Humidity

7.2.18.2 Specifications

- a) Wind Speed range 0 to 322km/h Accuracy $\pm 5\%$
- b) Wind Direction range 1-360° Accuracy $\pm 3^\circ$
- c) Barometric Pressure range 410 to 820mm Hg
- d) Air Temperature range: 0° to +60°C Accuracy $\pm 0.3^\circ\text{C}$
- e) Humidity range 1 to 100% RH $\pm 2\%$ Accuracy resolution 1%

7.2.19 Meteorological Monitor Display

7.2.19.1 Main Functions

- a) Display real time localized meteorological data/information of the port
- b) Display the following information:
 - Wind Speed
 - Wind Direction
 - Barometric Pressure
 - Air Temperature
 - Humidity

7.2.19.2 Specifications (minimum)

- a) Processor: 3.40 GHz, 6MB Cache, 24000MHz or better
- b) Operating System: Windows 10 Pro or latest version

- c) Memory: 8GB or more
- d) Storage: 500GB or more
- e) Standard components: keyboard, mouse, Optical drive
- f) Display: One (1) 24 inch widescreen LED display

7.2.20 Printer

7.2.20.1 Specifications

- a) Type: Inkjet, Print, Scan, Copy, Fax with ADF
- b) Resolution: 4800x2400 dpi
- c) Maximum Copy size: A3
- d) Paper handling Size: A3, A4, Legal, Letter
- e) Scanner Type: Flatbed
- f) Interface: USB, Ethernet, Wi-Fi, TCP/IPV4

7.2.21 Large Display

Two (2) set of large display shall be install for each VTMS Control center to display the VTMS Traffic and the CCTV images.

One (1) Large Display shall be install at the Office of the Port Manager to monitor the VTMS traffic.

7.2.21.1 Specifications

- a) Type: Full HD LCD DISPLAY
- b) Screen size (diagonal): 55in
- c) Aspect Ratio: 16:9
- d) Connection Terminal: Serial, DVI-D, HDMI, PC IN
- e) Power Requirements: AC 220-240V 50/60 Hz

7.2.22 Uninterrupted Power Supply

7.2.22.1 Specifications

- a) Capacity: suitable to supply monitoring PC, Operator Console, RDP, AIS & VHF Rack, Data base Server and others
- b) Capacity: 1KVA for work stations computers and 2.2kVA to 5KVA for servers. depend on the LOAD (should not exceed 33%)
- c) Input Voltage Window: 180-270VAC
- d) Phase: Single Phase
- e) Nominal Output Voltage: 230/230/240VACV
- f) Frequency: 60Hz
- g) Output Waveform: Pure Sine Wave
- h) Back-up time (Full Load): 3minutes \pm 15%
- i) Double conversion
- j) Hot swappable battery

7.2.23 Fast Ethernet Switch

Fast ethernet switch shall be provided for the interconnectivity of VTMS equipment and auxiliary network equipment.

7.2.23.1 Specifications

- a) At least 16-ports 10/100 Mbps Fast Ethernet ports or better
- b) Full/Half-Duplex for Ethernet/Fast Ethernet speeds
- c) Input Voltage: 220/230VAC

7.2.24 VOIP Telephone

VOIP Telephone shall be use for voice communications within the VTMS center and to Port Manager Office and CMIS.

7.2.24.1 Specifications

- a) Compatible with the existing VOIP Telephone at PPA CMIS VTS Monitoring Center.
- b) Protocol/Standard: record, SRV, NAPTR, DHCP, PPPoe, SSH, TFTP, NTP, STUN, SIMPLE, LLDP-MED, LDAP, TR-069, 802.1x, TLS, SRTP, CDP/SNMP/RTCP-XR
- c) Voice Codecs: Support for G.711, G.722 (wide-band), G.723, G.726-32, G.729 A/B, iLBC, in-band and out-of-band DTMF (In audio, RFC2833, SIP INFO), VAD, CNG, AEC, PLC, AJB, AGC

7.2.25 VOIP Converter for VHF Radio

VOIP Converter for VHF radio shall be install with speaker at CMIS to monitor the Maritime VHF communication of VTMS Iloilo, Davao and Zamboanga.

7.2.25.1 Specifications

- a) LAN Interface
 - i. Interface: 10BASE-T/100BASE-TX x 1 with auto negotiation function
Connector: RJ45
 - ii. Protocol: IPv4, TCP, UDP, RTP, HTTP, FTP, Telnet, SNMP, IGMPV2 (for IP unicast and multicast)
- b) Analog Interface
 - i. Interface: Analogue 4W/2W x 1
 - ii. Impedance: 600Ω
 - iii. level – 30dBm to 0dBm
 - iv. Coding Format: G.711μ-LAW

- v. Connector: Screwless terminal block (64kbps), G.726 (32kbps, 16kbps), G.729A CS-ACELP (8kbps), G.723.1 ACELP / MP-MLQ (5.3kbps, 6.3kbps)

7.2.26 VPN ROUTER and FIREWALL

The VPN Router and firewall shall be use to link up the VTMS System to PPA CMIS VTMS monitoring Center at PPA Head Office.

7.2.26.1 Main Functions

- a) Allows network communications within the VPN environment
- b) Prevents unauthorized access from and to the network

7.2.26.2 Specifications

- a) 100BASE-TX
- b) IP routing function
- c) Firewall: State full Packet inspection (SPI)
- d) MAC based control

7.2.27 Communication link to VTMSCC

The Communication link of the Office of the Port Manager and VTMSCC shall be established in order for the Port Manager to monitor the Vessel traffic data.

6.2.27.1 Specifications

- a) IP base link
- b) Reliable IP radio link or Fiber optic cable

7.2.28 Video Wall at PPA CMIS VTMS Central Monitoring

A 3x2 Video wall shall be installed at PPA CMIS VTMS Central Monitoring to Display VTMS traffic of each VTMS Center of each port including the existing VTMS Manila and Batangas.

7.2.28.1 Main Function

- a) To display the several VTMS traffic
- b) Able to customize the lay-out of the screen for better viewing

7.2.28.2 Specifications

- c) Multi-monitor set-up 3x2 video wall
- d) Quality: Must support a 24/7 operation
- e) Extreme narrow-bezel (maximum of 1.7mm) design
- f) Size: At least 55 inches per panel

- g) Resolution: 1920 x 1080
- h) Signal interface (input)
 - i. At least 1 x Analog D-SUB, DVI-D, Display Port 1.2
 - ii. At least 1 x HDMI 2.0
 - iii. At least 1 x USB 2.0
- i) With Mounting brackets and accessories
- j) With video wall controller to produce flexible screen lay-out

7.2.29 Diesel Engine Generator

Diesel Engine Generator shall be use as back-up power supply in the absence of commercial power

7.2.29.1 Specifications

- a) Phase: 3Phase
- b) Capacity: 75 KVA
- c) Power Factor: 0.8 or better
- d) Rated Speed: 1800rpm / 60Hz
- e) Fuel: Diesel
- f) Fuel Tank Capacity: 1000 liters (separate tank)
- g) With Automatic transfer switch

7.2.30 Interconnectivity of VTMS Control Center to PPA CMIS VTMS Central Monitoring

- a) The winning bidder shall be able to interconnect the VTMS Control Center of VTMS Iloilo, Davao and Zamboanga to the PPA CMIS VTMS Central Monitoring center at PPA Head Office.
- b) Necessary modification, updates and reconfiguration of existing equipment at PPA CMIS shall be done by the winning bidder to achieve the following functionalities.
 - i. The existing Multi-function console at PPA CMIS shall be able to monitor the VTMS traffic data of VTMS Iloilo, Davao and Zamboanga including the VTMS traffic data from existing VTMS Manila and VTMS Batangas.
 - ii. The Database server of VTMS Iloilo, Davao and Zamboanga shall be compatible and synchronize with the VTMS Central Data base at CMIS.
 - iii. The VTMS traffic of VTMS Iloilo, Davao and Zamboanga including VHF communication shall be recorded to the existing Recording and Playback at CMIS shall be able to playback.

- iv. The existing Web server shall also accommodate the VTMS data from VTMS Iloilo, Davao and Zamboanga in order to monitor VTMS traffic and other information.
- v. VHF voice communication of each Operator Console of VTMS Iloilo, Davao and Zamboanga shall be monitor at PPA CMIS.

PPA shall provide the necessary connectivity services from existing telecommunication company for the connectivity of VTMS Iloilo, Davao and Zamboanga to PPA CMIS VTMS Central monitoring.

8. PROVISIONS, DESIGN/SPECIFICATIONS AND PROFILE OF THE CONTROL CENTER

The proposed VTMS Control Center shall be designed considering the available lot within the port area. To minimize the land use for Control Center, a four (4) storey building shall be constructed with 4-legged self-supporting tower on top.

8.1 Architectural:

- 8.1.1 Venetian Blinds shall be provided for Glass walls.
- 8.1.2 Water-Proofing Membrane for the Roof Deck and Comfort Rooms (CR).
- 8.1.3 Housing for the Generator shall be provided with steel door with heavy duty padlock and hinges.
- 8.1.4 Provide Steel Ladder as Fire escape for all floors
- 8.1.5 Provide Steel veranda around the outside of the Operation room
- 8.1.6 Floor tile finish for all floors except for the generator room. Operation room shall be raised flooring.
- 8.1.7 Concrete walls to be painted applying three (3) coatings.
- 8.1.8 Concrete stairways with stainless pipe railings from ground floor to roof deck.
- 8.1.9 Profile and floor area of the Control Center shall be as indicated in Annex B.
- 8.1.10 Aluminum window framing with 6mm thick clear glass and 12mm diameter bar grills for all windows
- 8.1.11 Six (6) mm thick hardiplex ceiling board with 50mm x 50mm good lumber ceiling joist for all ceilings including the generator house, except for the electronic room.
- 8.1.12 Operation room shall have one (1) inch thick glass walls, panel type. Height of the glass walls shall be approximately 1.6 mounted on a concrete wall of one (1) meter high.
- 8.1.13 3rd floor shall have an open space on all sides of about 1 meter from the wall with 1.5 meter high concrete parapet with stainless pipe resting on top with a door as access.
- 8.1.14 Roof deck shall be enclosed with a 1.5 meter concrete parapet

- 8.1.15 Panel door complete with hinges and knobs and 150mm x 50mm door jamb made of yaka or equivalent shall be provided.
- 8.1.16 All trenches and the like shall be sprayed with Termite protection at a rate specified on the manufacturers manual.
- 8.1.17 An elevated raised access flooring shall be provided for the 3rd floor (Operation Room) in order to accommodate communication and power cables.
- 8.1.18 Binocular, Fax machine, Rectangular Table with Six (6) chairs and Four (4) chairs for operators shall be provided.

8.2 Civil Works

- 8.2.1 Concrete for structural parts or members such as deck or floor slabs, beams, pile caps, curtain walls and any other part of the Control Center and the R.C. piles shall develop a minimum 28-day compressive cylinder strength of 4,000 psi.
- 8.2.2 All bar reinforcement shall be deformed bars complying with ASTM 615. Grade 40 for all structural members having a characteristic strength (f_y) not less than 276N/mm².
- 8.2.3 Number of Pile and size and lengths shall be based on output of structural design.
- 8.2.4 Test pile with a length of twenty-five (25) meters shall be driven for each port prior to casting of regular piles in order to better understand the soil behavior of the proposed location.
- 8.2.5 Four (4) inches or one hundred (100) mm thick Concrete Hollow Blocks (CHB) plastered with plain cement 25mm thick, with 10mm diameter vertical and horizontal bars.
- 8.2.6 Steel towers resting on the roof deck of the 4th floor which shall be made of corrosion resistant, high strength hot dip galvanized steel and painted according to the standard set by the Civil Aviation Authority of the Philippines (CAAP).
- 8.2.7 Bolts and Anchor Bolts for the steel tower shall be high strength bolts combined with shear and tension of 280 – 1.8 $f_v \leq 303$ mpa.
- 8.2.8 Perimeter cyclone security fence with a height of two (2) meters and is two (2) meters away from the control center.
- 8.2.9 All structural steel shall conform to the ASTM A 36 $F_y=344$ mpa.
- 8.2.10 Welding works shall conform to American Welding Society (AWS).
- 8.2.11 Structural Works shall conform to the latest National Structural Code of the Philippines.

8.3 Electrical Works

- 8.3.1 Electrical works and Fire alarm system shall conform to the latest Philippine Electrical Code.
- 8.3.2 Provision Obstruction light, lightning arrester and grounding system
- 8.3.3 Provision Transient Voltage Surge Suppressor (TVSS)

8.3.4 Inter-Office communication equipment in all floors shall be provided

8.4 Sanitary Works

8.4.1 All plumbing and sanitary works shall conform to the latest National Plumbing Code of the Philippines.

8.4.2 Comfort rooms shall be provided at the 1st floor & 2nd floor.

8.4.3 Provide a septic vault with a dimension of W=2.5m x L=4.5m x H=2.5m.

8.4.4 Water sprinkler system for all floors.

8.5 Mechanical Works

8.5.1 One (1) unit Diesel Generator Set, 75KVA Capacity with separate fuel tank capacity of 1000 liters.

8.5.2 Air-Condition Unit

	Split Type (2 Hp)	Split Type/Floor Standing (5 Hp)
1 st Floor	1	
2 nd Floor (Admin Office)	1	
3 rd Floor (Operation Room)	2 (back-up)	1
4 th Floor (Equipment Room)	2	

9. MODE OF PAYMENT

9.1 Payment and progress billing as follows:

9.1.1 Billing no. 1 – Upon delivery and receipt of goods with equivalent amount in the contract.

9.1.2 Billing no. 2 – Upon Completion of installation, training and site acceptance.

9.1.3 Billing no. 3 – Completion of every semi-annual maintenance for the first year of maintenance services

9.1.4 Billing no. 4 – Completion of every semi-annual maintenance for the second year of maintenance services

9.1.5 Billing no. 5 – Completion of every semi-annual maintenance for the third year of maintenance services

9.1.6 Billing no. 6 – Completion of every semi-annual maintenance for the fourth year of maintenance services

9.1.7 Billing no. 7 – Completion of every semi-annual maintenance for the fifth year of maintenance services

9.2 Any progress payments shall be allowed however, upon completion of the work as per contract.

9.3 All progress billing shall be submitted together with corresponding documents representing support for claims for payment.

10. DELIVERY PERIOD (ACCEPTANCE AND TURN-OVER OF THE PROJECT)

- 10.1 The supply, delivery, installation, testing and commissioning works shall be completed within fifteen (15) months (project establishment phase), from the date receipt of the Notice to Proceed
- 10.2 Upon completion of all the works covered under the fifteen (15) months project establishment phase, the winning bidder shall turn over the project to PPA as completed for the issuance of the certificate of completion for the establishment phase.
- 10.3 On the date indicated on the certificate of completion for the project establishment phase, the start of the effectivity of the three (3) year extended warranty shall commence.
- 10.4 Upon Completion of all works covered under the three (3) year extended warranty, the winning bidder shall initiate and request for the issuance of the certificate of completion for the three (3) year extended warranty phase.
- 10.5 On the date indicated on the certificate of completion for the installation, training and site acceptance, the start of the effectivity of the five (5) years maintenance services shall commence.
- 10.6 Upon completion of all works covered under the five (5) year maintenance period, the winning bidder shall request for the issuance of the certificate of completion for the five (5) year maintenance phase.

However, the delivery period may be extended, upon written request of the winning bidder and upon written approval by PPA, in the event of unforeseen circumstances such as natural disaster, pandemic/epidemic, civil unrest, armed conflict (force majeure) that might occur during the project implementation and affect the progress in the completion of the project. The period of extension shall be in accordance with the actual condition and upon confirmation by PPA.

11. REQUIREMENT UNDER THE THREE (3) YEAR EXTENDED WARRANTY PERIOD WITH THE FIVE (5) YEAR MAINTENANCE PERIOD;

The three (3) year extended warranty period with the five (5) maintenance period shall commence simultaneously after the issuance of the site acceptance certificate for the supply, installation, test commission and training.

11.1 WARRANTY

- 11.1.1 The three (3) year extended warranty period is intended to fix & repair any defects and failure of workmanship on the equipment to ensure a continuous VTMS Operation.

- 11.1.2 Extended warranty shall cover all workmanship, system parts, accessories, other materials and equipment and services shall be warranted by the winning bidder for three (3) years from the issuance of site acceptance certificate. The winning bidder shall be required to post a warranty bond in any acceptable form under the procurement law in order to assure that manufacturing defects will be corrected within the warranty period.
- 11.1.3 Extended warranty shall not cover on equipment damage or failure due to acts of nature including damage by typhoons and earthquakes, accidents, electrical mishaps, abuse or improper operations, damages cause by third party equipment modification without the consent of the qualified service provider and damages due to rodent attack and infestation by insects (cable being eaten by the rats, mice and etc.)
- 11.1.4 The winning bidder shall be required to conduct a maintenance services under the three (3) years extended warranty to ensure the continuous operation of the system and the supplied equipment at the VTMS Control Centers and CMIS at a minimum of at least two (2) times a year during warranty period;

11.2 MAINTENANCE SERVICES

The five (5) years Maintenance services shall include:

- 11.2.1 The start of the effectivity of the five (5) years maintenance services shall commence on the date indicated on the certificate of completion for the installation, training, and site acceptance.
- 11.2.2 Maintenance works on all parts and components in the VTMS Control Centers and CMIS at a minimum maintenance check of at least two (2) times a year;
- 11.2.3 Emergency on-site corrective maintenance/repair due failure of equipment.
- 11.2.4 Provide full technical support on a 24/7 basis on all issues and concerns resulting from technical difficulties, system malfunctions or minor troubleshooting.
- 11.2.5 Prepare and submit regular maintenance reports containing the following:
 - a) Schedule and progress of maintenance works (programmed and actual);
 - b) Assessment report on vital parts and components.

11.2.6 Exclusions:

The following are excluded from provision under the five (5) years maintenance services to be rendered by the winning bidder.

- a. Corrective maintenance on equipment damage or failure due to acts of nature including damage by typhoons and earthquakes, accidents, electrical mishaps, abuse or improper operations, damages cause by third party equipment modification without the consent of the qualified service provider and damages due to rodent attack and infestation by insects (cable being eaten by the rats, mice and etc.)
- b. Support in terms of services from any third party supplied hardware or software that are not included under this Terms of Reference (TOR);
- c. Maintenance service that require rust removal, repainting and repairs on all steel tower structures, concrete tower structures including its street members.
- d. Maintenance services on air conditioning units, fire alarm system including sprinkler system, plumbing, water pump, drainage, receptacle outlets, lighting and cable/wirings or rough-ins related to electrical system.
- e. Maintenance services on the building and structures e.g. fence, lamp posts, gate other structures within the vicinity of station etc.
- f. Spare Units and consumables that are not included on the supplied goods;

12. OTHER DOCUMENTARY REQUIREMENTS (TECHNICAL, FINANCIAL AND LEGAL DOCUMENTS)

The following technical, financial and legal documents and references together with other required documents shall be submitted:

- 12.1 The Bidder shall submit the company profile showing the company's line of business, experience, years of existence and list of officers. The manufacturer of the major VTMS equipment shall have a local office in the Philippines.
- 12.2 The bidder should have an experience to supply, install and commissioning of Vessel Traffic System in the Philippines. Bidders should provide proof of the completion certificate issued by their respective clients.

Bidders and/or manufacturer must submit supply records of supplying the VTMS equipment with solid state radar transmitter/receiver in the Philippines, with at least two integrated remote radar stations with one

control center during the last five (5) years from the date of submission and receipt of bids and supported with client certificate.

- 12.3 Bidder shall have their own local team of engineers and technicians especially trained on VTMS radar operation and maintenance to facilitate the immediate repair and maintenance during the warranty period and thereafter.

The bidder shall submit the respective Bio-Data of at least two (2) registered electronics engineers with valid PRC license who are permanently detailed in the Philippines and must be regularly employed by the local duly registered office of the prospective bidder. The above registered electronics engineers must have an actual experience of not less than five (5) years in the installation and maintenance of VTMS Radars and must have certificate of training particularly for radar maintenance and operation issued by reputable radar manufacturer. Above engineers must be capable to conduct training to PPA Engineers and Operators/staff for the VTMS radar operation and maintenance. As proof, the bidder shall also submit certificate of employment of the two (2) Registered Electronics Engineers, together with their valid professional licenses or Certificate issued by PRC (Professional Regulation Commission).

- 12.4 Guarantee must be given that the technical personnel shall be made available immediately upon receipt of a report on any technical problem encountered during the operation of the system within the warranty period.

12.5 List of Manufactured VTMS Equipment

Major equipment for VTMS shall be supplied by a single manufacturer, consists of X-BAND Radar with Solid State Transmitter and receiver, Automatic Identification System (AIS) Base Station Dual Transponder and VHF Maritime Radio. Software integration of those equipment shall be done by the same manufacturer. This will be an advantage for an ease maintenance of the system and future hardware and firmware update that need constantly change due to the advances of technology.

The bidder shall submit the list of major equipment to be supplied in which at least four (4) of the major VTMS equipment (i.e. radar antenna, radar transmitter/receiver, AIS and VHF communication equipment) supported with equipment brochure, required for this project are manufactured by a single manufacturer, including the related software to ensure that parts are compatible with the system.

In addition to the requirement, the radar transmitter/receiver, AIS transponder and VHF communication equipment shall have Type Acceptance Certificate issued by the National Telecommunications Commission (NTC) to be submitted as part of the bid requirement.

Non-Submission of the said Type of Acceptance certificate will declare the bidder fail or disqualify.

12.6 Letter of Authorization from the Equipment Manufacturers

In the case of a bidder who offers to supply and install major VTMS radar items of supply under the project that the bidder did not manufacture or otherwise produce, the bidder shall provide/submit in his bid proposal a Letter of Authorization from the equipment manufacturer, showing that the Bidder has been duly authorized by the equipment manufacturer and duly authenticated by the Philippine consulate at the manufacturer's country of origin.

12.7 The bidder shall submit certificate that the company/supplier is in existence as a business entity supplying VTMS for at least five (5) years in the Philippines.

12.8 The bidder shall submit a guarantee letter stating that the Manufacturer's Engineer shall be made available immediately within forty-eight (48) hours upon receipt of a report on any technical problem encountered during the operation of the system within the warranty period and thereafter.

12.9 The bidder shall submit a certification of after-sales support and a guarantee stating the availability of spare parts within the next 10 years for major VTMS equipment (i.e. radar equipment AIS & VHF maritime radio).

12.10 Bar Chart showing the schedule of monthly activities that include the schedule of production, delivery and installation of VTMS equipment, training for Operators, construction of Control Center and other related activities, all of which shall not exceed fifteen (15) months from receipt of the Notice to Proceed.

12.11 Brochures, leaflets or literatures/technical document of the following equipment, electronic devices and components to be supplied should be provided in English:

- a. Radar antenna
- b. Solid state radar transmitter/receiver
- c. Radar Track/Radar Processor
- d. CCTV camera
- e. Automatic Identification System (Base Station)
- f. Meteorological Sensor
- g. VHF Communication Equipment
- h. Multi-sensor Integrated Processor

13. VTMS BLOCK DIAGRAM FOR EACH PORT - ANNEX A

14. PROFILE OF THE VTMS CONTROL CENTER- ANNEX B

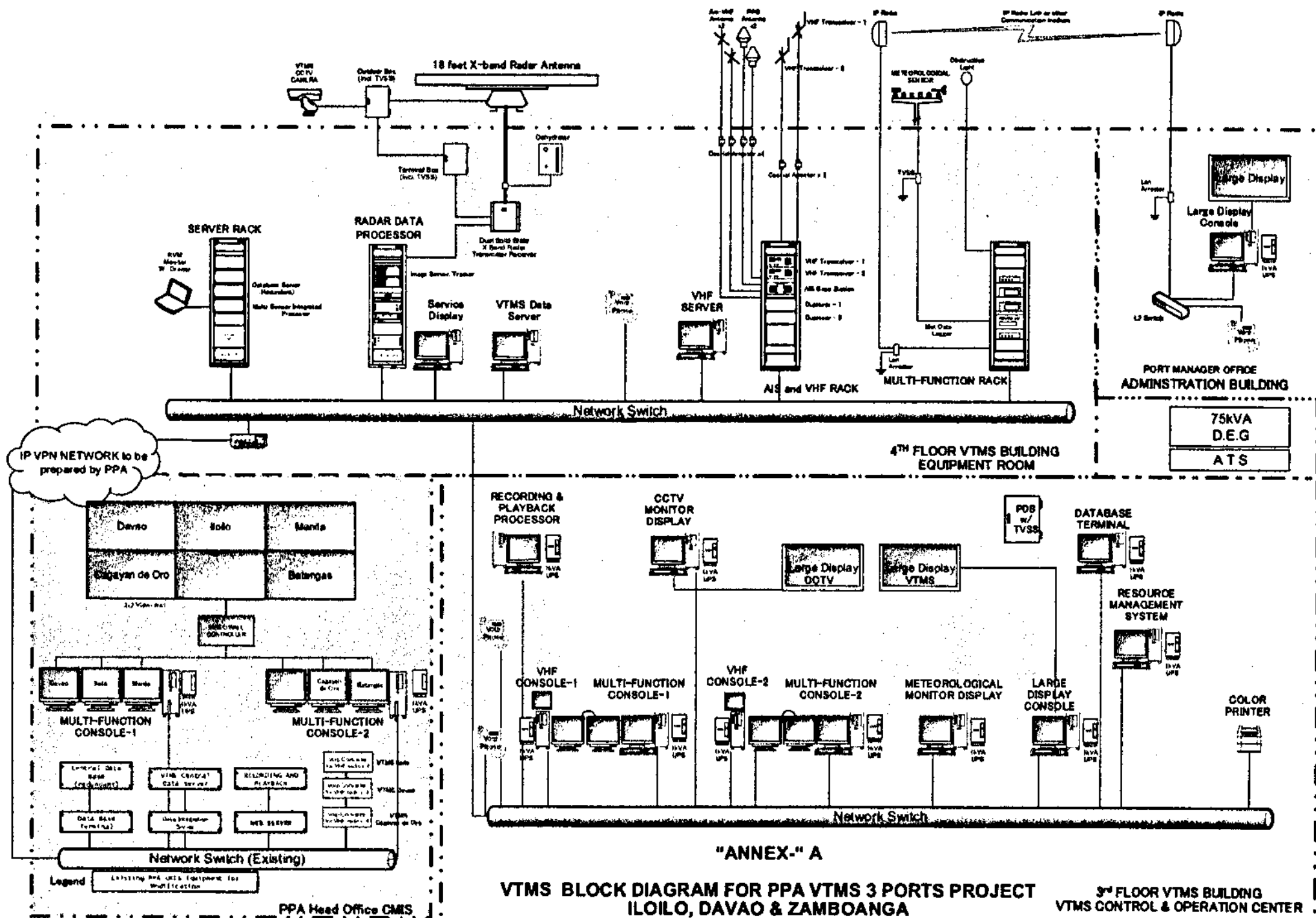
• ANNEX C

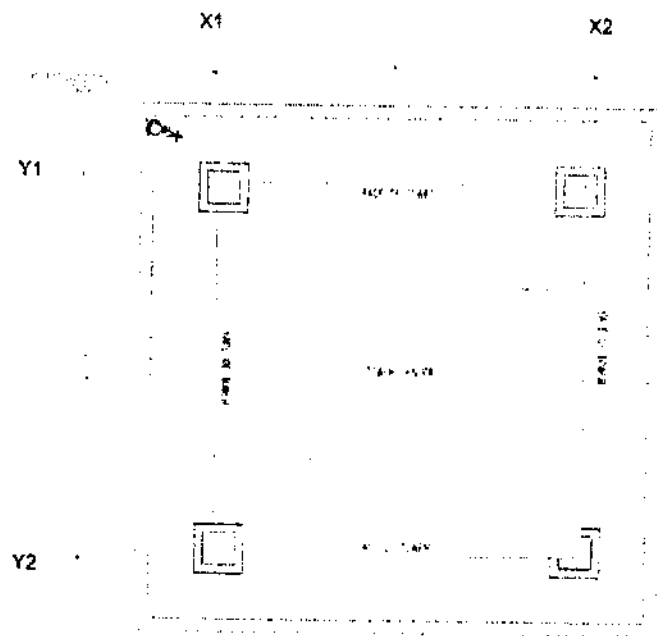
- ANNEX D

EDUARDO P. GOLES
Port Manager
FMC Paray/Guimaras

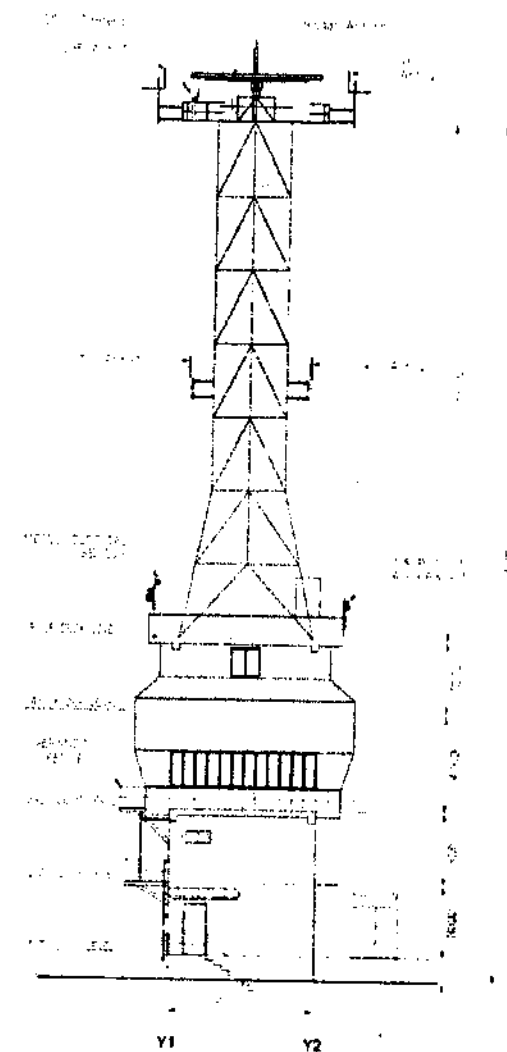
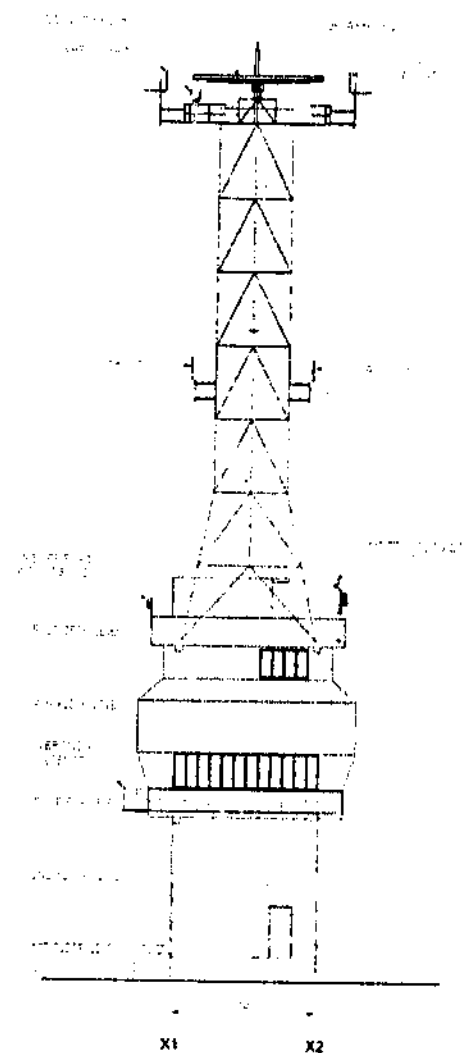
ANALEE G. AGUILAR
Port Manager
PMO Davao

ARCIDI S. JUMAANI
Port Manager
PMO Zamboanga





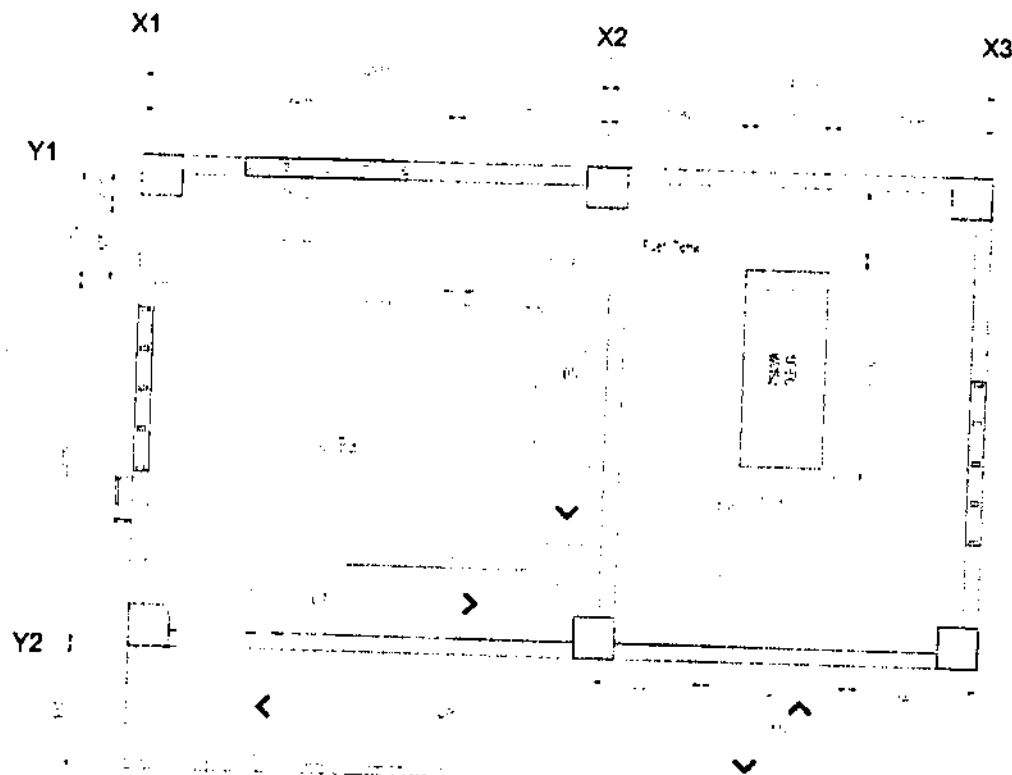
RADAR STATION LAYOUT



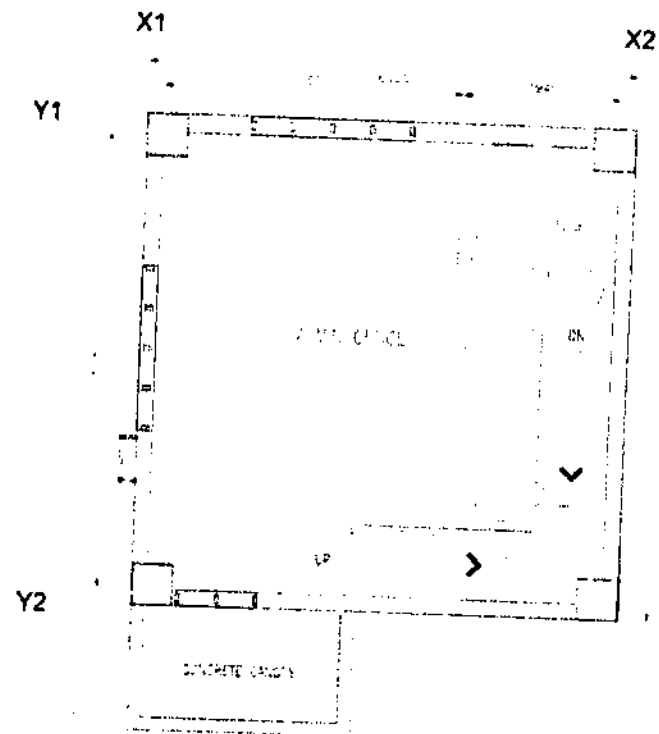
ELEVATION Y1-Y2

ANNEX - "B" (1/3)

**PROFILE OF THE VTMS CONTROL CENTER
FOR PPA VTMS 3 PORTS PROJECT (ILOILO, DAVAO & ZAMBOANGA)**



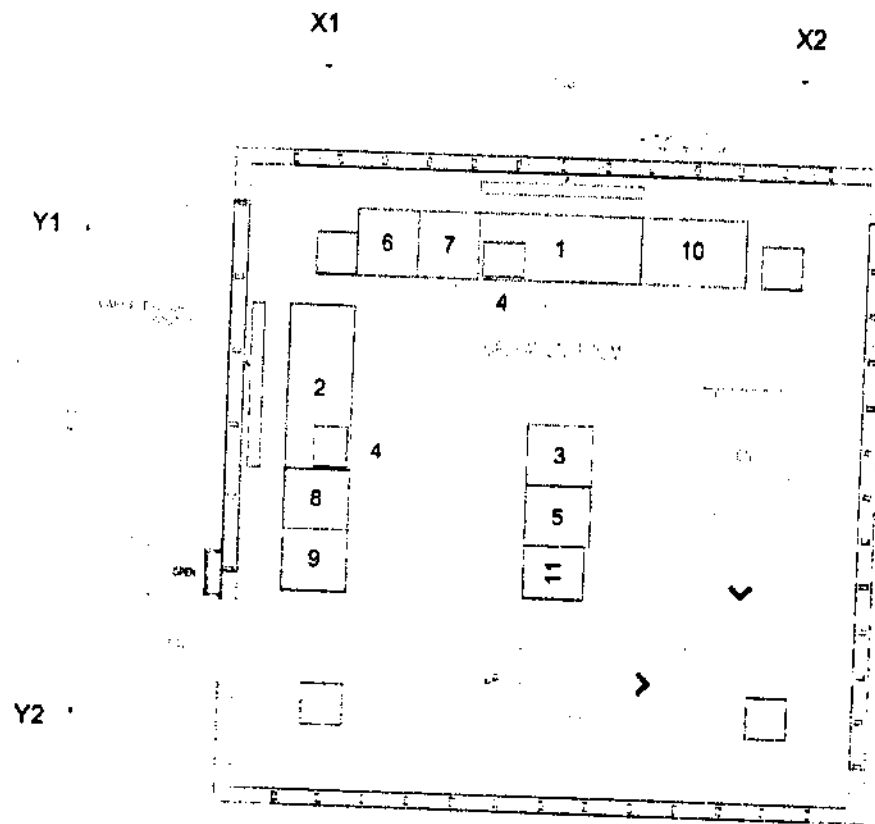
1ST FLOOR SECTION LAYOUT



2ND FLOOR SECTION LAYOUT

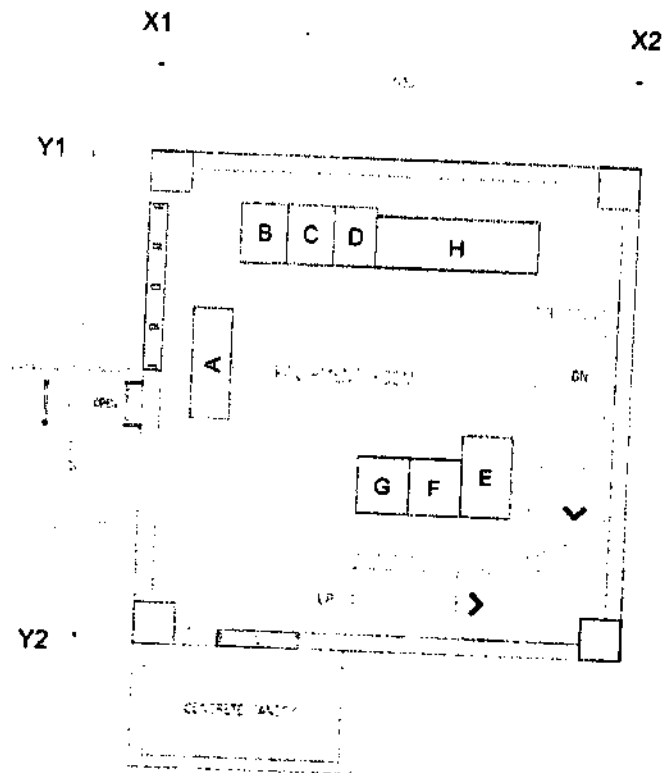
ANNEX - "B" (2/3)

PROFILE OF THE VTMS CONTROL CENTER
FOR PPA VTMS 3 PORTS PROJECT (ILOILO, DAVAO & ZAMBOANGA)



- AD EQUIPMENT LIST
- 1 OPERATOR CONSOLE 1 (HP PANEL)
 - 2 OPERATOR CONSOLE 2 (HP PANEL)
 - 3 CRT MONITOR DISPLAY 1
 - 4 HP CONSOLE
 - 5 VIDEO LOGICAL MONITOR DISPLAY
 - 6 NETWORK MANAGEMENT SERVER
 - 7 DATA BASE TERMINAL
 - 8 RECORDING AND PLAYBACK PROCESSOR
 - 9 AS SERVER
 - 10 PRINTER
 - 11 LARGE DISPLAY AND CONTROLLER

3RD FLOOR SECTION LAYOUT



- AD EQUIPMENT LIST
- A SOLID STATE PALCAM 10K
 - B R-200 DATA PROCESSOR
 - C AS-100 RACK
 - D MULTIFUNCTION RACK
 - E SERVER RACK 2
 - F SERVICE DISPLAY
 - G MULTISENSOR INTEGRATED DISPLAY
 - H HP SERVER

4TH FLOOR SECTION LAYOUT

ANNEX - "B" (3/3)

**PROFILE OF THE VTMS CONTROL CENTER
FOR PPA VTMS 3 PORTS PROJECT (ILOILO, DAVAO & ZAMBOANGA)**

ANNEX - "C"

**SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF VESSEL TRAFFIC MANAGEMENT SYSTEM (VTMS)
AT THE PORTS OF LOLO, DAVAO AND ZAMBOANGA**

BILL OF QUANTITY

SUMMARY

Item	Particular	QTY	Unit Price	Amount
A.	Supply of Equipment/Hardware and Software			
-1	VTMS Iloilo	1 lot		
-2	VTMS Davao	1 lot		
-3	VTMS Zamboanga	1 lot		
-4	PPA CMIS	1 lot		
	Sub-total			
B.	Construction of VTMSCC Building			
-1	VTMS Iloilo			
-2	VTMS Davao	1 lot		
-3	VTMS Zamboanga	1 lot		
	Sub-total			
C.	Engineering Services (Equipment Works)			
	Design, Survey Installation Test and Commissioning Acceptance	1 lot		
-1	Site Survey			
-2	Installation, Test and Commissioning			
-3	On Site Training			
-4	Site Acceptance			
	Sub-total			
D.	Three (3) Years Extended Warranty with Five (5) Years Maintenance Services			
	First Year Maintenance Services (Semi-Annual)	1 lot		
	Second Year Maintenance Services (Semi-Annual)	1 lot		
	Third Year Maintenance Services (Semi-Annual)	1 lot		
	Fourth Year Maintenance Services (Semi-Annual)	1 lot		
	Fifth Year Maintenance Services (Semi-Annual)	1 lot		
	Sub-total			
E.	Custom Duty and Import Processing			
		1 lot		
F.	Miscellaneous and other Related works (logistics, packaging and insurance)			
		1 lot		
	TOTAL (VAT EX)			
	VAT 12%			
	GRAND TOTAL			

ANNEX - "C"

SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF VESSEL TRAFFIC MANAGEMENT SYSTEM (VTMS)
AT THE PORTS OF ILOILO, DAVAO AND ZAMBOANGA

BILL OF QUANTITY

VTMS ILOILO

Detailed Bill of Quantities for Equipment/Hardware (specification contained in the TOR)

Item	Particular	QTY	Unit Price	Amount
A.	Supply of Equipment/Hardware and Software			
1	VTMS Control Center and Radar Station			
1.1	18 feet X-band Radar Antenna	1 set		
1.2	X-Band Solid-State Radar Transmitter-Receiver (Dual)	1 set		
1.3	Radar Data Processor (RDP)	1 set		
1.4	Service Display	1 set		
1.5	Multi-sensor Integrated Processor	1 set		
1.6	Multi-Function Console	1 set		
1.7	Large Display Console	2 sets		
1.8	Recording and playback processor (record/replay)	1 set		
1.9	Database Server (Redundant)	1 set		
1.10	Data Base Terminal	1 set		
1.11	VTMS Data Server	1 set		
1.12	Resource Management Server	1 set		
1.13	Automatic Identification System(AIS) Base Station Dual Transponder	1 set		
	VHF antenna, GPS, Coaxial arrester, duplexer and Coaxial cables			
1.14	VHF Transceiver	2 sets		
	Includes Antenna, Duplexer and coaxial arrester			
1.15	VHF Controller	2 sets		
1.16	VHF Server	1 set		
1.17	CCTV Camera	1 set		
1.18	Network Video recorder	1 set		
1.19	CCTV Monitor Display	1 set		
1.20	Meteorological Sensor	1 set		
1.21	Meteorological Monitoring	1 set		
1.22	Inkjet Printer	1 set		
1.23	Large Display including stand or mounting bracket	2 sets		
1.24	Uninterrupted Power Supply	1 lot		
1.25	Fast Ethernet Switch	1 lot		
1.26	IP VPN ROUTER/FIREWALL	1 set		
1.27	VOIP Telephone	3 sets		
1.28	Diesel Engine Generator includes;	1 lot		
	a. Automatic Transfer Switch			
	b. Fuel tank (1,000 Mers capacity)			
1.29	AC PDB	1 lot		
1.30	TVSS	1 set		
1.31	Equipment Rack	1 lot		
1.32	Furniture and others;	1 lot		
	a. Operator Console table and Printer table			
	b. Chair	5 sets		
	c. Binoculars	1 set		
	d. Rectangular table	1 set		
	e. Computer table for other equipment	1 lot		
1.33	Recommended Spare Parts	1 lot		
1.34	Initial Supply of Maintenance Tools and Testing Equipment	1 lot		
2	PORT Manager Office			
2.1	Large Display Console	1 set		
2.2	Large Display including stand or mounting bracket	1 set		
2.3	Large Display stand or fixing materials	1 set		
2.4	VOIP Telephone	1 set		
2.5	First Ethernet switch	1 lot		
2.6	Communication link to VTMSCC	1 lot		
2.7	Table and chair	1 lot		
3	Equipment Installation Materials			
		1 lot		
	Sub-total of A			

B.	Construction of VTMSCC Building			
1	Design and Construction of VTMS Control Center	1 lot		
	-Civil, architectural, structural, sanitary/plumbing, Electrical, mechanical works, including obstruction light, Grounding, Lighting Arrester, Fire Protection, ACU, Station units, etc.			
2	Layout/Detailing of Site Development			
3	Design and Erection of Steel Tower and Platform			
4	Design and Construction of General Shed			
	Sub-total of B			
	TOTAL Per Port (VAT EX)			

ANNEX - "C"

SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF VESSEL TRAFFIC MANAGEMENT SYSTEM (VTMS)
AT THE PORTS OF ILOILO, DAVAO AND ZAMBOANGA

BILL OF QUANTITY

VTMS DAVAO

Detailed Bill of Quantities for Equipment/Hardware (specification contained in the TOR)

Item	Particular	QTY	Unit Price	Amount
A.	Supply of Equipment/Hardware and Software			
1	VTMS Control Center and Radar Station			
1.1	18 feet X-band Radar Antenna			
1.2	X-Band Solid-State Radar Transmitter-Receiver (Dual)	1 set		
1.3	Radar Data Processor (RDP)	1 set		
1.4	Service Display	1 set		
1.5	Multi-sensor Integrated Processor	1 set		
1.6	Multi-Function Console	1 set		
1.7	Large Display Console	2 sets		
1.8	Recording and playback processor (record/replay)	1 set		
1.9	Database Server (Redundant)	1 set		
1.10	Data Base Terminal	1 set		
1.11	VTMS Data Server	1 set		
1.12	Resource Management Server	1 set		
1.13	Automatic Identification System(AIS) Base Station Dual Transponder	1 set		
	VHF antenna, GPS, Coaxial arrester, duplexer and Coaxial cables			
1.14	VHF Transceiver	2 sets		
	Includes Antenna, Duplexer and coaxial arrester			
1.15	VHF Controller			
1.16	VHF Server	2 sets		
1.17	CCTV Camera	1 set		
1.18	Network Video recorder	1 set		
1.19	CCTV Monitor Display	1 set		
1.20	Meteorological Sensor	1 set		
1.21	Meteorological Monitoring	1 set		
1.22	Inkjet Printer	1 set		
1.23	Large Display including stand or mounting bracket	1 set		
1.24	Uninterrupted Power Supply	2 sets		
1.25	Fast Ethernet Switch	1 lot		
1.26	IP VPN ROUTER/FIREWALL	1 lot		
1.27	VOIP Telephone	1 set		
1.28	Diesel Engine Generator includes;	3 sets		
	a. Automatic Transfer Switch	1 lot		
	b. Fuel tank (1,000 Mers capacity)			
1.29	AC PDB			
1.30	TVSS	1 lot		
1.31	Equipment Rack	1 set		
1.32	Furniture and others;	1 lot		
	a. Operator Console table and Printer table			
	b. Chair	1 set		
	c. Binoculars	5 sets		
	d. Rectangular table	1 set		
	e. Computer table for other equipment	1 set		
1.33	Recommended Spare Parts	1 lot		
1.34	Initial Supply of Maintenance Tools and Testing Equipment	1 lot		
2	PORT Manager Office			
2.1	Large Display Console			
2.2	Large Display including stand or mounting bracket	1 set		
2.3	Large Display stand or fixing materials	1 set		
2.4	VOIP Telephone	1 set		
2.5	First Ethernet switch	1 set		
2.6	Communication link to VTMSCC	1 lot		
2.7	Table and chair	1 lot		
		1 lot		
3	Equipment Installation Materials			
		1 lot		
	Sub-total of A			
B.	Construction of VTMSCC Building			
		1 lot		

1	Design and Construction of VTMS Control Center			
	-Civil, architectural, structural, sanitary/plumbing, Electrical, mechanical works, including obstruction light, Grounding, Lighting Arrester, Fire Protection, ACU, Station units, etc.			
2	Layout/Detailing of Site Development			
3	Design and Erection of Steel Tower and Platform			
4	Design and Construction of General Shed			
	Sub-total of B			
	TOTAL Per Port (VAT EX)			

ANNEX - "C"

SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF VESSEL TRAFFIC MANAGEMENT SYSTEM (VTMS)
AT THE PORTS OF ILOILO, DAVAO AND ZAMBOANGA

BILL OF QUANTITY

VTMS ZAMBOANGA

Detailed Bill of Quantities for Equipment/Hardware (specification contained in the TOR)				
Item	Particular	QTY	Unit Price	Amount
A.	Supply of Equipment/Hardware and Software			
1	VTMS Control Center and Radar Station			
1.1	18 feet X-band Radar Antenna			
1.2	X-Band Solid-State Radar Transmitter-Receiver (Dual)	1 set		
1.3	Radar Data Processor (RDP)	1 set		
1.4	Service Display	1 set		
1.5	Multi-sensor Integrated Processor	1 set		
1.6	Multi-Function Console	1 set		
1.7	Large Display Console	2 sets		
1.8	Recording and playback processor (record/replay)	1 set		
1.9	Database Server (Redundant)	1 set		
1.10	Data Base Terminal	1 set		
1.11	VTMS Data Server	1 set		
1.12	Resource Management Server	1 set		
1.13	Automatic Identification System(AIS) Base Station Dual Transponder	1 set		
	VHF antenna, GPS, Coaxial arrester, duplexer and Coaxial cables			
1.14	VHF Transceiver	2 sets		
	Includes Antenna, Duplexer and coaxial arrester			
1.15	VHF Controller			
1.16	VHF Server	2 sets		
1.17	CCTV Camera	1 set		
1.18	Network Video recorder	1 set		
1.19	CCTV Monitor Display	1 set		
1.20	Meteorological Sensor	1 set		
1.21	Meteorological Monitoring	1 set		
1.22	Inkjet Printer	1 set		
1.23	Large Display including stand or mounting bracket	1 set		
1.24	Uninterrupted Power Supply	2 sets		
1.25	Fast Ethernet Switch	1 lot		
1.26	IP VPN ROUTER/FIREWALL	1 lot		
1.27	VOIP Telephone	1 set		
1.28	Diesel Engine Generator includes:	3 sets		
	a. Automatic Transfer Switch	1 lot		
	b. Fuel tank (1,000 Mers capacity)			
1.29	AC PDB			
1.30	TVSS	1 lot		
1.31	Equipment Rack	1 set		
1.32	Furniture and others:	1 lot		
	a. Operator Console table and Printer table			
	b. Chair	1 set		
	c. Binoculars	5 sets		
	d. Rectangular table	1 set		
	e. Computer table for other equipment	1 set		
1.33	Recommended Spare Parts	1 lot		
1.34	Initial Supply of Maintenance Tools and Testing Equipment	1 lot		
2	PORT Manager Office			
2.1	Large Display Console			
2.2	Large Display including stand or mounting bracket	1 set		
2.3	Large Display stand or fixing materials	1 set		
2.4	VOIP Telephone	1 set		
2.5	Fast Ethernet switch	1 set		
2.6	Communication link to VTMSCC	1 lot		
2.7	Table and chair	1 lot		
3	Equipment Installation Materials	1 lot		
	Sub-total of A			
B.	Construction of VTMSCC Building	1 lot		

1	Design and Construction of VTMS Control Center			
	-Civil, architectural, structural, sanitary/plumbing, Electrical, mechanical works, including obstruction light, Grounding, Lighting Arrester, Fire Protection, ACU, Station units, etc.			
2	Layout/Detailing of Site Development			
3	Design and Erection of Steel Tower and Platform			
4	Design and Construction of General Shed			
	Sub-total of B			
	TOTAL Per Port (VAT EX)			

ANNEX – "C"

**SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF VESSEL TRAFFIC MANAGEMENT SYSTEM (VTMS)
AT THE PORTS OF LOILO, DAVAO AND ZAMBOANGA**

BILL OF QUANTITY

PPA CENTRAL MONITORING INFORMATION SYSTEM

Detailed Bill of Quantities for Equipment/Hardware (specification contained in the TOR)

Item	Particular	QTY	Unit Price	Amount
1	PPA Head Office CMIS			
1.1	3 x 2 Video Wall	1 lot		
1.2	Video Wall Controller	1 lot		
1.3	VOIP Converter for VHF Radio	12 sets		
1.4	Additional monitor 24 inches	2 sets		
1.5	Integration works of VTMS 3 Ports to CMIS	1 lot		
	TOTAL for CMIS (VAT EX)			

ANNEX – “D”

SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF VESSEL TRAFFIC MANAGEMENT SYSTEM (VTMS) AT THE PORTS OF ILOILO, DAVAO AND ZAMBOANGA

SCHEDULE OF ACTIVITIES

PARTICULARS		MONTH															YEAR				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2	3	4	5
	Milestone	Notice to Proceed																			
1	Design, Procurement, Production of Equipment and Software Development	Design, Procurement, Production of Equipment and Software Development																			
2	Shipment, customs clearance, local transportation										Shipment										
3	Local Procurement	Local Procurement																			
4	Design and Construction work for VTMSCC	Design and Construction work for VTMSCC																			
5	Installation Works, test and Adjustment											Installation Works, test and Adjustment									
6	Training												Training								
7	Overall test, Site Acceptance and Handover															Overall test, Site Acceptance and Handover					
8	Warranty Period																Warranty Period				
9	Maintenance Services																Maintenance Services				

Section VIII. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

- ☐ (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages);
or
- ☐ (b) Registration certificate from Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives or its equivalent document,
and
- ☐ (c) Mayor's or Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas;
and
- ☐ (d) Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR).

Technical Documents

- ☐ (f) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid; and
- ☐ (g) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided for in Sections 23.4.1.3 and 23.4.2.4 of the 2016 revised IRR of RA No. 9184, within the relevant period as provided in the Bidding Documents; and
- ☐ (h) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;
or
Original copy of Notarized Bid Securing Declaration; and
- ☐ (i) Conformity with the Technical Specifications, which may include production/delivery schedule, manpower requirements, and/or after-sales/parts, if applicable; and
- ☐ (j) Original duly signed Omnibus Sworn Statement (OSS);
and if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.

Financial Documents

- ☐ (k) The Supplier's audited financial statements, showing, among others, the Supplier's total and current assets and liabilities, stamped "received" by the BIR or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission; and
- ☐ (l) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC);

or

A committed Line of Credit from a Universal or Commercial Bank in lieu of its NFCC computation.

Class "B" Documents

- ☐ (m) If applicable, a duly signed joint venture agreement (JVA) in case the joint venture is already in existence;

or

duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

Other documentary requirements under RA No. 9184 (as applicable)

- ☐ (n) *[For foreign bidders claiming by reason of their country's extension of reciprocal rights to Filipinos]* Certification from the relevant government office of their country stating that Filipinos are allowed to participate in government procurement activities for the same item or product.
- ☐ (o) Certification from the DTI if the Bidder claims preference as a Domestic Bidder or Domestic Entity.

25 FINANCIAL COMPONENT ENVELOPE

- ☐ (a) Original of duly signed and accomplished Financial Bid Form; **and**
- ☐ (b) Original of duly signed and accomplished Price Schedule(s).

Bid Form for the Procurement of Goods
[shall be submitted with the Bid]

BID FORM

Date : _____

Project Identification No. : _____

To: [name and address of Procuring Entity]

Having examined the Philippine Bidding Documents (PBDs) including the Supplemental or Bid Bulletin Numbers [insert numbers], the receipt of which is hereby duly acknowledged, we, the undersigned, offer to [supply/deliver/perform] [description of the Goods] in conformity with the said PBDs for the sum of [total Bid amount in words and figures] or the total calculated bid price, as evaluated and corrected for computational errors, and other bid modifications in accordance with the Price Schedules attached herewith and made part of this Bid. The total bid price includes the cost of all taxes, such as, but not limited to: [specify the applicable taxes, e.g. (i) value added tax (VAT), (ii) income tax, (iii) local taxes, and (iv) other fiscal levies and duties], which are itemized herein or in the Price Schedules,

If our Bid is accepted, we undertake:

- a. to deliver the goods in accordance with the delivery schedule specified in the Schedule of Requirements of the Philippine Bidding Documents (PBDs);
- b. to provide a performance security in the form, amounts, and within the times prescribed in the PBDs;
- c. to abide by the Bid Validity Period specified in the PBDs and it shall remain binding upon us at any time before the expiration of that period.

Until a formal Contract is prepared and executed, this Bid, together with your written acceptance thereof and your Notice of Award, shall be binding upon us.

We understand that you are not bound to accept the Lowest Calculated Bid or any Bid you may receive.

We certify/confirm that we comply with the eligibility requirements pursuant to the PBDs.

The undersigned is authorized to submit the bid on behalf of [name of the bidder] as evidenced by the attached [state the written authority].

We acknowledge that failure to sign each and every page of this Bid Form, including the attached Schedule of Prices, shall be a ground for the rejection of our bid.

Name: _____

Legal capacity: _____

Signature: _____
Duly authorized to sign the Bid for and behalf of: _____
Date: _____

Name of Bidder _____ Project ID No. _____ Page ____ of ____

Name: _____

Signature: _____

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Genomic map of the 100 Mb region on chromosome 10p12.3. The map shows the location of the 100 kb region highlighted in the previous figure, with various genes and features labeled along the chromosome.

Name of Bidder _____ Project ID No. _____ Page ____ of ____

Duly authorized to sign the Bid for and behalf of: _____

Bid Securing Declaration Form
[shall be submitted with the Bid if bidder opts to provide this form of bid security]

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.

BID SECURING DECLARATION
Project Identification No.: [Insert number]

To: [Insert name and address of the Procuring Entity]

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid Securing Declaration.
2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1(b), 34.2, 40.1 and 69.1, except 69.1(f), of the IRR of RA No. 9184; without prejudice to other legal action the government may undertake.
3. I/We understand that this Bid Securing Declaration shall cease to be valid on the following circumstances:
 - a. Upon expiration of the bid validity period, or any extension thereof pursuant to your request;
 - b. I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right; and
 - c. I am/we are declared the bidder with the Lowest Calculated Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/We have hereunto set my/our hand/s this ____ day of [month]
[year] at [place of execution].

[Insert NAME OF BIDDER OR ITS
AUTHORIZED REPRESENTATIVE]
[Insert signatory's legal capacity]
Affiant

[Jurat]
[Format shall be based on the latest Rules on Notarial Practice]

Contract Agreement Form for the Procurement of Goods (Revised)
[Not required to be submitted with the Bid, but it shall be submitted within ten (10) days after receiving the Notice of Award]

CONTRACT AGREEMENT

THIS AGREEMENT made the _____ day of _____ 20____ between [name of PROCURING ENTITY] of the Philippines (hereinafter called “the Entity”) of the one part and [name of Supplier] of [city and country of Supplier] (hereinafter called “the Supplier”) of the other part;

WHEREAS, the Entity invited Bids for certain goods and ancillary services, particularly [brief description of goods and services] and has accepted a Bid by the Supplier for the supply of those goods and services in the sum of [contract price in words and figures in specified currency] (hereinafter called “the Contract Price”).

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents as required by the 2016 revised Implementing Rules and Regulations of Republic Act No. 9184 shall be deemed to form and be read and construed as integral part of this Agreement, viz.:

- i. Philippine Bidding Documents (PBDs);
 - i. Schedule of Requirements;
 - ii. Technical Specifications;
 - iii. General and Special Conditions of Contract; and
 - iv. Supplemental or Bid Bulletins, if any
- ii. Winning bidder’s bid, including the Eligibility requirements, Technical and Financial Proposals, and all other documents or statements submitted;

Bid form, including all the documents/statements contained in the Bidder’s bidding envelopes, as annexes, and all other documents submitted (e.g., Bidder’s response to request for clarifications on the bid), including corrections to the bid, if any, resulting from the Procuring Entity’s bid evaluation;
- iii. Performance Security;
- iv. Notice of Award of Contract; and the Bidder’s conforme thereto; and
- v. Other contract documents that may be required by existing laws and/or the Procuring Entity concerned in the PBDs. Winning bidder agrees that additional contract documents or information prescribed by the GPPB that are subsequently required for submission after the contract execution, such

as the Notice to Proceed, Variation Orders, and Warranty Security, shall likewise form part of the Contract.

3. In consideration for the sum of [total contract price in words and figures] or such other sums as may be ascertained, [Named of the bidder] agrees to [state the object of the contract] in accordance with his/her/its Bid.
4. The [Name of the procuring entity] agrees to pay the above-mentioned sum in accordance with the terms of the Bidding.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of the Republic of the Philippines on the day and year first above written.

[Insert Name and Signature]

[Insert Name and Signature]

[Insert Signatory's Legal Capacity]

[Insert Signatory's Legal Capacity]

for:

for:

[Insert Procuring Entity]

[Insert Name of Supplier]

Acknowledgment

[Format shall be based on the latest Rules on Notarial Practice]

Omnibus Sworn Statement (Revised)
[shall be submitted with the Bid]

REPUBLIC OF THE PHILIPPINES)
CITY/MUNICIPALITY OF _____) S.S.

AFFIDAVIT

I, [Name of Affiant], of legal age, [Civil Status], [Nationality], and residing at [Address of Affiant], after having been duly sworn in accordance with law, do hereby depose and state that:

1. [Select one, delete the other:]

[If a sole proprietorship:] I am the sole proprietor or authorized representative of [Name of Bidder] with office address at [address of Bidder];

[If a partnership, corporation, cooperative, or joint venture:] I am the duly authorized and designated representative of [Name of Bidder] with office address at [address of Bidder];

2. [Select one, delete the other:]

[If a sole proprietorship:] As the owner and sole proprietor, or authorized representative of [Name of Bidder], I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached duly notarized Special Power of Attorney;

[If a partnership, corporation, cooperative, or joint venture:] I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached [state title of attached document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable)];

3. [Name of Bidder] is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government/foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as defined and provided for in the Uniform Guidelines on Blacklisting;

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. [Name of Bidder] is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. [Select one, delete the rest:]

[If a sole proprietorship:] The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a partnership or cooperative:] None of the officers and members of [Name of Bidder] is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a corporation or joint venture:] None of the officers, directors, and controlling stockholders of [Name of Bidder] is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. [Name of Bidder] complies with existing labor laws and standards; and

8. [Name of Bidder] is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:

a. Carefully examining all of the Bidding Documents;

b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;

c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and

d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the [Name of the Project].

9. [Name of Bidder] did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.

10. In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to

deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of ____, 20__ at _____, Philippines.

[Insert NAME OF BIDDER OR ITS
AUTHORIZED REPRESENTATIVE]

[Insert signatory's legal capacity]

Affiant

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice]

Performance Securing Declaration (Revised)

[if used as an alternative performance security but it is not required to be submitted with the Bid, as it shall be submitted within ten (10) days after receiving the Notice of Award]

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.

PERFORMANCE SECURING DECLARATION

Invitation to Bid: [Insert Reference Number indicated in the Bidding Documents]

To: [Insert name and address of the Procuring Entity]

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, to guarantee the faithful performance by the supplier/distributor/manufacturer/contractor/consultant of its obligations under the Contract, I/we shall submit a Performance Securing Declaration within a maximum period of ten (10) calendar days from the receipt of the Notice of Award prior to the signing of the Contract.
2. I/We accept that: I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of one (1) year for the first offense, or two (2) years for the second offense, upon receipt of your Blacklisting Order if I/We have violated my/our obligations under the Contract;
3. I/We understand that this Performance Securing Declaration shall cease to be valid upon:
 - a. issuance by the Procuring Entity of the Certificate of Final Acceptance, subject to the following conditions:
 - i. Procuring Entity has no claims filed against the contract awardee;
 - ii. It has no claims for labor and materials filed against the contractor; and
 - iii. Other terms of the contract; or
 - b. replacement by the winning bidder of the submitted PSD with a performance security in any of the prescribed forms under Section 39.2 of the 2016 revised IRR of RA No. 9184 as required by the end-user.

IN WITNESS WHEREOF, I/We have hereunto set my/our hand/s this ____ day of [month] [year] at [place of execution].

[Insert NAME OF BIDDER OR ITS
AUTHORIZED REPRESENTATIVE]
[Insert signatory's legal capacity]
Affiant

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice]

NET FINANCIAL CONTRACTING CAPACITY (NFCC) COMPUTATION

- A. The values of the bidder's current assets and current liabilities shall be based on the data submitted to the BIR, through its Electronic Filing and Payment System (EFPS).

		Year 20__
1.	Total Assets	
2.	Current Assets	
3.	Total Liabilities	
4.	Current Liabilities	
5.	Net Worth (1-3)	
6.	Net Working Capital (2-4)	

- B. The Net Financial Contracting Capacity (NFCC) based on the above data is computed as follows:

NFCC = [(Current asset minus current liabilities) (15)] minus the value of all outstanding or uncompleted portions of the projects under ongoing contracts, including awarded contracts yet to be started, coinciding with the contract to be bid

NFCC = Php _____

K = 15

Herewith attached are certified true copies of the income tax return and audited financial statement: stamped "RECEIVED" by the BIR or BIR authorized collecting agent for the immediately preceding year.

Submitted by:

Name of Supplier/Distributor/Manufacturer

Signature of Authorized Representative

**STATEMENT OF THE BIDDER'S ONGOING GOVERNMENT AND PRIVATE CONTRACTS,
INCLUDING CONTRACTS AWARDED BUT NOT YET STARTED**

This is to certify that _____ has the following ongoing government and private contracts, including contracts awarded but not yet started:

NAME OF THE CONTRACT	DATE OF THE CONTRACT	CONTRACT DURATION	OWNER'S NAME & ADDRESS	KINDS OF GOODS/SERVICES DELIVERED	AMOUNT OF CONTRACT	VALUE OF OUTSTANDING CONTRACT	DATE OF DELIVERY

***PROOF OF CONTRACT TO BE PRESENTED AT POST-QUALIFICATION.**

Name and Signature of Authorized Representative

Date

**STATEMENT OF THE BIDDER'S SINGLE LARGEST COMPLETED CONTRACT (SLCC)
SIMILAR TO THE CONTRACT TO BE BID**

This is to certify that _____ has completed the following:

NAME OF THE CONTRACT	DATE OF THE CONTRACT	CONTRACT DURATION	OWNER'S NAME & ADDRESS	KINDS OF GOODS	AMOUNT OF COMPLETED CONTRACT/S	DATE OF DELIVERY	END USER'S ACCEPTANCE OR OFFICIAL RECEIPT(S) OR SALES INVOICE ISSUED FOR THE CONTRACT*

*TO BE ATTACHED TO THE STATEMENT

Name and Signature of Authorized Representative

Date