BIDS AND AWARDS COMMITTEE

Project : **PROCUREMENT OF TRACKWORK, ELECTRICAL, AND MECHANICAL (E&M) SYSTEM AND INTEGRATION WITH EXISTING SYSTEMS FOR LRT LINE 2 - EAST (MASINAG) EXTENSION PROJECT**

General Bid Bulletin No. 4-2017

TO ALL PROSPECTIVE BIDDERS:

Please find attached clarifications and amendments for the above-mentioned Project.

- Annex A: Answers to Queries
- Annex B: Revisions/Amendments to the Bidding Documents
- Annex C: Revised CCTV Specifications

For your guidance and information.

Issued this 14th day of July 2017.

ROMMEL D. RIVERA
Chairman, Bids and Awards Committee II

Procurement Service of the Department of Budget and Management (PS-DBM)
Capacity Enhancement of Mass Transit Systems in Metro Manila:
Procurement of Trackwork, Electrical and Mechanical Systems and Integration with Existing Systems for Light Rail Transit (LRT) Line 2 - East (Masinag) Extension Project
Answers to Queries

ITEM NO.	REFERENCE CLAUSE/SECTION	BIDDERS' ISSUES/CONCERNS/QUERIES *(lifted from the written queries submitted by prospective bidders; names of bidders have been omitted)*	PS-DBM's RESPONSE
		PART 2 – EMPLOYER'S REQUIREMENTS	
1	Signaling TS, section 5.0.d (SIL for ATS)	The ATS on the existing Line 2 is not certified to SIL 2. We therefore suggest that the requirements on the ATS for the East Extension project (with respect to SIL certification) shall be the same as for the ATS in the existing Line 2.	The Bidder's suggestion is acceptable that the ATS requirements with respect to SIL certification shall be the same as for the ATS in the existing LRT Line 2. However,the ATS for the LRT Line 2 East Extension shall provide the functionality and performance requirements stated in the Signaling Technical Specifications, Sections 8.3 and 8.4; and, shall not constrain or reduce the function and performance of the ATS for the existing LRT Line 2.
2	TEL ER 7.2, 5th bullet (Analog video encoders for CCTV)	It is our understanding that the existing OCC does not contain CCTV cameras, either analog or digital. Please confirm that this requirement applies to the security cameras installed in selected buildings, stabling areas and locations within the Santolan Depot, as mentioned in TEL ER 7.1 (CCTV System). Also, in reference to our question below (re: CCTV Upgrade of existing stations) please confirm that no upgrade was implemented for the Depot CCTV system. Thus, the supply and installation of video encoders (analog to digital signal converter) for the existing analog cameras in the Depot is part of the scope of this bid. Also, please quantify the number of the existing analog cameras in the depot if it is still part of the scope of this bid.	CCTV cameras installed in selected buildings, stabling areas and locations within the Santolan Depot are not included in the Line 2 East Extension scope of work. For clarification: CCTV System for LRT Line 2 stations and depot have been converted to an IP system. Clause 7.2 is revised to read as follows: "The specification of the CCTV system covers technical specification and requirement of an IP based CCTV system for Line 2 East Extension and OCC consisting of the following but not limited to: • Indoor & outdoor fixed type IP cameras;

Procurement Service of the Department of Budget and Management (PS-DBM) Capacity Enhancement of Mass Transit Systems in Metro Manila: Procurement of Trackwork, Electrical and Mechanical Systems and Integration with Existing Systems for Light Rail Transit (LRT) Line 2 - East (Masinag) Extension Project Answers to Queries			
ITEM NO.	**REFERENCE CLAUSE/SECTION**	**BIDDERS' ISSUES/CONCERNS/QUERIES** *(lifted from the written queries submitted by prospective bidders; names of bidders have been omitted)*	**PS-DBM's RESPONSE**
			• Fixed dome type IP cameras; • Indoor P/T/Z IP dome cameras; • Outdoor P/T/Z cameras in the reversing tracks; • ~~Video encoders for existing analog cameras (at OCC);~~ • Video management hardware & software; • NVR/RAID recording servers; • Ethernet Gigabit switches; and •Workstations at ~~OCC and~~ Ticket booths at the new stations."

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Revisions/Amendments/Clarifications to Bidding Documents

ITEM NO.	REFERENCE	REVISION/AMENDMENT
		PART 2 – EMPLOYER'S REQUIREMENTS
1	Part 2, Employer's Requirements, Section VI-2-2 Technical Specifications, iv. Signaling	SIG Clause 2.0 c) is revised to read as follows: "xxx • The Signaling system between Emerald Station and Masinag Station including wayside equipment; • Supply and Installation of four (4) platform mirrors at Emerald and Masinag Stations (two for each station), each with a stainless-steel mirror finish approximately 600mm in width and 800mm in height, mounted on a pole/pedestal 1300mm above the platform surface; xxx"
2	Part 2, Employer's Requirements, Section VI-2-2 Technical Specifications, v. Telecommunications System	Tel Clause 7.0 Closed Circuit Television (CCTV) is replaced in its entirety by Annex"C".

Procurement Service of the Department of Budget and Management (PS-DBM)

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Annex "C"

Technical Specifications – Telecommunications System

Clause 7.0 Closed Circuit Television (CCTV)

6.10 Software

a) Six (6) sets of error free CD/DVD software complete with covering documentation shall be supplied to the Employer.

b) The software shall be displayed with a version number and the date of issue.

c) Updates to the software must be available to the Employer either through a website or via issue on CD/DVD.

d) The Contractor must advise the Employer promptly by email or letter of their availability.

e) Windows based software is preferred.

f) All software licenses shall be paid for by the Contractor up to the expiration of the warranty period.

7.0 Closed Circuit Television (CCTV)

7.1 Overview of Existing CCTV System

All eleven (11) stations along LRT Line 2 are currently provided with CCTV systems to monitor passenger movements and safety in the stations. The CCTV system can be operated independently from the station's ticket booth CCTV monitoring facilities and can be controlled simultaneously from Workstations in the OCC via the existing Fiber Optic backbone.

Recording from all the cameras in the passenger stations and Substations is accomplished at the Station and viewed in the OCC~~using VHS Recorders~~. Security cameras are also installed in selected buildings, stabling areas and locations ~~such as the OCC~~ within the Santolan Depot.

7.2 General

The specification of the CCTV system covers technical specification and requirement of an IP based CCTV system for Line 2 East Extension and OCC consisting of the following but not limited to:

- Indoor & outdoor fixed type IP cameras;
- Fixed dome type IP cameras;
- Indoor P/T/Z IP dome cameras;
- Outdoor P/T/Z cameras in the reversing tracks;
- ~~Video encoders for existing analog cameras (at OCC);~~
- Video management hardware & software;
- NVR/RAID recording servers;
- Ethernet Gigabit switches;and
- Workstations at ~~OCC and~~ Ticket booths at the new stations.

7.3 System Requirements

a) The CCTV system for the LRT Line 2 East Extension shall be designed, supplied, installed, tested and commissioned by the Contractor. The system shall be color, digital IP based and employ state-of-the-art equipment.

b) The video surveillance system shall be end to end IP base with IP cameras installed in stations as per site requirements. This shall include the Gigabit switches, CCTV workstations for the stations ~~and OCC~~, redundant servers and digital video recorders~~comprising an IP based Video Management System at the OCC~~.

c) The CCTV system shall enable the ticket booth staff of the new stations and OCC operational staff viewing of high quality CCTV images which are very vital in providing train and passenger control, safety, security surveillance and controlled evacuation of the new railway stations.

d) Fixed box type IP color cameras with varifocal lens shall be provided in platforms, gates, and entrance/exit points.

e) Fixed dome type IP color cameras shall be installed in indoor locations such as concourses, ticket counters, ticket booths, offices, and train controller's booth.

f) High speed PTZ IP dome cameras shall cover circulating areas, concourses, Rectifier Substations, foot bridges, station walkways, interconnecting walkways to other locations and for general area surveillance. Strategically installed overhead PTZ cameras inside the RSS shall be able to cover the RSS.

g) CCTV cameras with adequate resolution shall be provided for clear record and viewing.

h) The Contractor shall install two optical fiber cables running on separate tracks, thus providing cable path diversity.

i) The CCTV system shall permit the OCC and Station Ticket Booth to view the same scene simultaneously should it be so required.

j) Industrial IP Gigabit switches over dedicated fiber optic rings shall be the medium of transporting CCTV images from the station's camera outputs to the OCC.

~~k) IP based Centralized Monitoring system and video recording system at the OCC will replacethe existing analog CCTV centralized equipment at the OCC.~~

~~l) The Station's Digital Video Codec (compressor/decompressor) and Ethernet Switch shall be IP based Video Management system converting the analogue camera signal into a compressed digital format (e.g. H.264 or MPEG4 -10) thus allowing the recovery of full-motion NTSC TV signals.~~

m) The CCTV monitor shall be installed in the new station's Ticket Booth/s and shall have the ability to switch to any view of the station areas and all areas covered by the cameras.

Display shall be via a 40 inch high-resolution LED monitors giving single or up to 16 multi split views of all cameras installed in the stations.

n) Camera Sequencing or scanning shall be possible and can be varied depending on operator's preference.

o) The OCC operator shall have the ability to view and ~~record~~extract any camera output from the new stations ~~and existing 11 stations on the new Network Video recorder~~on the new IP based monitoring system at the OCC.

p) A video wall at the OCC dedicated for CCTVshall be provided to project selected video information for the new stations;~~from Signaling, SCADA & CCTV systems~~ at least 4 units of 47-inch high resolution LED monitor shall be provided.

q) Compression systems shall be configured to allow H.264 video compression algorithms to be used with minimum latency between reference frames such that an acceptable playback system resolution of 4CIF is achieved when viewing a recorded image of a resolution test target of 30 frames per second.

r) The Contractor shall employ low latency design to prevent pixelization during playback of images on the workstation monitors. Packet loss shall also be avoided to prevent image impairment.

s) No distortion shall occur to the video images in any CCTV monitor, in either quad or full frame display format, immediately after video switching or any other circumstances due to the signal traveling time differences among video signals and power phase differences of video cameras within the station(s).

t) The digital video storage array shall be fully compatible with theexisting~~proposed~~ IP CCTV Video Management System.

u) The recording capacity of the Rapid Array Independent Disk (RAID) shall be sufficient for thirty one (31) days motion detected mode recording/archiving from all cameras of ~~existing and~~the new stations of Line 2. Computation for the Terabytes storage capacity based on the above conditions and H.264 compression shall be submitted for approval by the Engineer.

v) ~~To save on Network Video Recorder (NVR) storage capacity at the OCC, the~~The stations shall be equipped with an IP digital storage medium for ~~temporary~~ storage of recorded images ~~before final recording and storage at the NVR storage disks at the OCC~~.

w) The NVR while providing for recording, local and remote surveillance shall be equipped with intelligent video analytics and enhanced file security by digital watermark as may be required.

x) The CCTV systems for the new stations must include the capability to associate text information, such as time, date, and camera identification, with the images recorded by the system as well as any digital signature used for security. The time displayed on the system shall be derived from theexistingMaster Clock System.

y) The system shall provide diagnostics facility for serial, video & network interfaces. System logging shall be possible either to a remote IP address or console port or on the system.

For the new stations of Line 2, as much as possible, IP Camera and Software (Video Management, Video Recording and Video analytic software) shall be from the same manufacturer. The System shall provide secured recording for evidence purposes and user authentication to protect data integrity.

7.4 Camera Specifications

a) The cameras shall be a high-resolution day and night network camera integrated into an all-weather NEMA 4/IP66 rated enclosure designed for both indoor and outdoor applications.

b) The cameras shall be an industrial grade, color, and full-featured for day/night operation with at least 2megapixel resolution to capture HD images at 30 frames per seconds.

c) The cameras shall be powered via the Ethernet (Power-Over-Ethernet) using an IEEE 802.3af power source to save on electrical wiring and conduits.

d) The product shall be designed to meet industrial and surveillance applications requiring a low power, rugged video camera with IP network capability.

e) Auto dome cameras shall have 1080 and 720 P video resolution.

f) The operating temperature range shall be 0 to 60°C. Relative humidity up to 95%.

g) Each camera shall have a video at various Common Intermediate Format (CIF) and a dual stream capability such that the viewing and recording are achieved at different resolutions.

h) Digital image authentication shall be optionally available and licensed to verify that images have not been altered, manipulated, or tampered with, in anyway.

i) The camera shall provide on-screen time/date and text displays. The text display can be programmed to dynamically change when motion alarms are detected.

j) The camera shall provide built-in motion detection allowing up to multiple separate, rectangular motion windows (zones) to be independently configured to have pixels included in the motion calculations.

k) The camera shall support 10/100BASE-TX communications and incorporate a built-in web server, built-in FTP server, and a built-in FTP client.

7.5 System Design

a) Prior to system design, a thorough survey of the station facility in which the system will be installed must be carried out and analyzed as an integral part of the existing total system-design process and risk assessment.

b) A layout plan documenting the location and field-of-view of each camera in the system should be included as a part of this survey.

c) The control of the new CCTV and APS system in the stations shall be integrated into a single workstation.

d) These systems will act as "stand alone" systems ~~initially~~, i.e. as two (2) independent "stand alone" CCTV systems~~. At a later stage these stations~~and shall be linked back to the OCC.

~~e) This is contingent upon completion of the OCC upgrade, MSTP expansion and installation of a new fiber optic backbone. Using a decorated fiber optic cable as backbone.~~

f) The Contractor shall propose a seamless integration of the new CCTV equipment for the LRT Line 2 East Extension to the existing CCTV system of Line 2.

7.6 Submission Requirements

a) The Contractor shall submit with his tender, block diagrams of proposed CCTV system at each station and process of integration with the existing CCTV network. This shall include cameras, network switches, workstations, servers, RAID storage device and monitors, video wall at OCC drawings of each platform or area being viewed by the CCTV system, indicating the choice of lens, the angle of view and the rationale for positioning the camera at the locations indicated in the drawings.

b) The drawing shall indicate the position of the camera in plan view and the angle of intended view at each platform, concourse, stairway, elevator and escalator areas and other areas as required.

7.7 Scope of Work and Installation Requirements

a) The scope of work includes but not limited to installing field CCTV assemblies consisting of camera, zoom lens, pan/tilt drive, power supply and standard or dome enclosure. Work scope also includes furnishing and installation of associated CCTV workstation equipment, GB Ethernet Switches, Fiber Optic/UTP cabling and network electronics.

b) At the OCC, ~~a complete Video Monitoring Device shall be provided and interface with the existing Video Management System.with centralized monitoring and recording facilities shall be installed:~~the aggregate video output from the two stations CCTV head-end (Emerald and Masinag) shall be integrated into the existing Centralized CCTV Monitoring System of Line 2.

c) The work also includes installation of communication interfaces for fiber optic and data cable.

d) The Contractor shall take such precautions that are necessary to guard against electromagnetic interference, to supply adequate ventilation, and to install the equipment so as to provide maximum safety to the person who operates it.

e) The contractor shall provide all the necessary hardware and software, interfaces and accessories for the CCTV cameras to be installed in the new stations and RSS.

f) The equipment for the CCTV shall be mounted within the TER of the new station.

g) The Contractor shall be responsible for powering the CCTV Equipment from the UPS at the TER to the Ticket booth, RSS and designated locations.

h) The platform cameras shall be strategically located in order to have a clear and unobstructed view of all train doors to be displayed on split view workstation screen.

i) To protect against damage or theft, cameras must be mounted in such a position to be out of reach of members of the public or vandals. Where this is not possible, the camera shall be installed such as to make it very difficult for the member of the public or vandals to remove or damage such items easily.

j) All switches, connectors, outlets, conduits and cables shall be clearly, logically and permanently marked during installation.

k) The camera/lens assembly shall be setup at the factory and installed in an outdoor environmental housing.

l) Cabling shall be based on ANSI/TIA/EIA sets of standards for CCTV cabling installation.

m) CCTV cameras requiring Power over Ethernet (PoE) shall utilize Cat 6 cable. The Gigabit Ethernet Switches shall incorporate sufficient PoE capable Ethernet ports with redundant power supplies.

n) The external power injectors shall be used only for locations where the Ethernet switches are existing and do not incorporate PoE capable ports functionality.

o) The contractor shall provide and install high grade UTP Category 6, 4-pair cable with RJ45 connectors between the Gigabit Switch and the camera location.

p) For cabling distances exceeding 300 ft., the contractor shall provide, install and terminate a 4-strand single-mode fiber cable. Such installation shall be accompanied by the corresponding installation and termination of the 220VAC UPS-backed power wiring and shall be routed in separate raceways from the TER.

q) The corresponding standard Media Converter with IEEE802.3af standard for PoE supply shall be implemented on the receiving end as per project design.

r) The video monitors at the ticket booth when wall mounted shall use standard steel brackets and the included base.

s) The equipment for the CCTV ~~such as Video Encoders, decoders and Gigabit Switches~~ shall be mounted within the TER at each station.

t) The workstation PC in the station ~~and OCC~~ shall have a digital keyboard for P/T/Z functionality.

7.8 Technical Specifications/Standards

a) All equipment shall conform to NTSC video standard, EMC compatibility standards for railway applications.

b) All displayed images, bandwidth and CIF shall conform to relevant video surveillance standards.

c) Cameras should be equipped with automatic mechanisms to ensure proper exposure under varying lighting conditions. Such mechanisms include, but are not limited to, automatic gain circuitry, day/night sensor switching, and lenses with automatic iris functions.

d) The selection of lenses shall be dictated by the field-of-view to be covered by each camera, as well as by the size of the camera's detector.

e) All cameras shall be provided with waterproof, dust proof and vandal resistant housings.

f) High Speed Pan Tilt Zoom (PTZ) shall be dome type with imager designed for day and night surveillance. The mounting shall provide an adjustable head that shall allow the housing to be rotated in a 360° horizontal pan, and a 180° vertical tilt. The ingress protection shall conform to IP 54.

g) Minimum light requirement to produce a color image shall be approximately 0.30 lux. When in the IR sensitive Night mode, less than 0.05 lux (.005fc) will produce a black and white image.

Cameras shall also have these features:

- UTP video transmission option (PTZ models);
- 25X optical zoom lens (PTZ models);
- Auto/manual focus;
- 12X digital zoom (PTZ);
- Lens: varifocal;
- Focus : Automatic with manual override;
- Iris adjustment: Automatic with Manual Override;
- Contour Sharpness enhancement level: selectable;
- Signal-to-Noise Ratio > 50 dB;
- Gain : up to 28 dB selectable;
- Aperture Correction : Horizontal and vertical;

- Programmable electronic shutter control;
- Backlight compensation;
- 360° continuous pan (PTZ); and
- Line lock.

h) ~~All~~Station monitors to be supplied shall have the following specifications:

• Monitor	40 inches;
• Type	TFTLCD;
• Native Resolution	1280 x 1024 pixels or higher;
• Colour	24-bit true colouror higher;
• Viewing angle	160 degrees;
• Brightness	300cdlm^{2}or better;
• Contrast	700: 1 or better; and
• Response time	l2ms or faster.

7.9 Station's Network Video Server Specification

7.9.1 Basic Technical Requirements

The station's network video server shall have the basic functions to:

- Encode NTSC images from surveillance cameras installed in the stations or other video source into MPEG-4, DVD-like quality video for transmission to the station's workstation PC and to OCC via a Gigabit Ethernet LAN Switch/FOTS.
- Provide storage of the MPEG-4 (H.264) video in its local hard drive.
- The unit shall be designed for use in CCTV applications.
- The server shall be rack mounted with front panel LED indicators that display the status of power, any transfer of data to and from the hard drive, and the occurrence of a hardware failure.
- The server shall be fully compatible with the existing Video Management softwareand interoperable with the existing CCTV system of Line 2.

7.9.2 Network Video Recorder (NVR) Technical Requirements

a) The recorder shall be capable of simultaneously encoding 30 frames per second of non-multiplexed, video for each of the eight channels at a data rate of 9.6kBit/s to 6Mbit/s per channel or better.

b) The NVR shall have an external Storage Device with RAID 5 array consisting of similar internal storage drive capacity from 1TB to 50 TB thus allowing the server to function efficiently as a DVR to provide long term video recording of the H.264 video streams.

c) The server shall be capable of sending images to the ~~network video recorder (NVR) at the~~ OCC via FOTS ~~for long term archiving~~.

d) The front panel of the server shall allow the user to view configuration settings and status of the unit such as IP address, gateway or MAC address and other information but shall not allow reconfiguration of those parameters from the front panel.

e) The server shall function as a web video server via the network when used with a standard web browser as the decoder. The server's encoder shall provide dual stream MPEG-4 video or H.264 images to the browser.

f) The server shall support a recording mode that allows live or recorded sections of a video sequence currently being viewed at ~~the browser to be recorded on the hard drive of~~ theexisting IP based workstation at theOCC~~workstation~~.

g) The server shall allow the recorded video to be played back and viewed from a workstation(s) and simultaneously be capable of recording the H.264 video to the server's internal hard drive.

h) The internal clock of the Video server shall be synchronized from the existing master clock system of LRT Line 2.

i) The server shall have multi Password-protected authorization levels to prevent unauthorized access to the Video server.

j) The server shall be provided with all the necessary software for programming, configuration and viewing from the web browser.

k) The system shall allow the recording, live monitoring, playbackofarchivedvideo anddatasimultaneously.

7.10 Software/GUI

a) The CCTV system for the new stations shall be compatible and interoperable with the ~~accompanying~~existingCCTV Management software.All CCTV equipment with embedded computers for the new stations can be programmed by accompanying software ~~or upgrades~~.

b) All software components shall be part of the manufacturer's standard software product offering. All software components shall be thoroughly tested and proven in reference installations.

c) The GUI shall interface directly with the existingVideo Management system at the OCCor video switcher/control system and provide complete control and programming of all system features.

d) The RAID shall be implemented either using a special controller (hardware RAID), or by an operating system driver (software RAID).

e) The contractor shall supply the software to program and configure the new equipment for the new stations. The software shall work in conjunction with the latest Windows (8) Operating System, which shall be backward compatible with the earlier versions.

f) Software shall consist of the following but not limited to;

- Network Video Management Software;
- Network Video Recording Software;
- Video Analytics Software; and
- Graphical User Interface Client Software features.

~~**7.11 Network Video Management Software**~~

~~a) The software shall be a highlyscalable enterprise level software with complete video surveillance solution thatwill be scalable to a required numbers of camerasthatcanbeaddedonaunit by unitbasis.~~

~~b) Thenetworkvideomanagementsoftwareshall allowforvideotobestreamed on a video mosaic wall.~~

~~c) Video management software shall offer both video stream management and video stream storage management. Recording frame rate and resolution in respect of individual channel shall be programmable.~~

~~d) All Software and upgrades shall be licensed. Six copies of each type shall be supplied with the system.~~

~~e) The disks shall indicate the date, version no. and the operating system employed.~~

7.12 Testing and Commissioning

a) The Contractor shall conduct Factory Acceptance Test at the place of manufacture to demonstrate compliance to technical specification and system performance with functional description of the proposed system. The test shall be witnessed by the Engineer and qualified technical staff of the Employer. The cost of all tests shall be borne by the Contractor.

b) The testing and commissioning of the Telecommunication system at the new stations such as CCTV and APS systems shall proceed also in a staged manner to reflect the installation of both the stand-alone station and integrated systems.

8.0 Supervisory, Control And Data Acquisition (SCADA)

8.1 Introduction

The newly upgraded SCADA System under the Stimulus Fund Project for LRT Line 2 installed in the six (6) Rectifier Substations enables remote monitoring, telemetering and control of Substation facilities. SCADA systems were likewise provided in eleven (11) stations for monitoring of electrical devices, fire alarm systems, UPS and for monitoring the condition of Escalators and Lifts in the stations.

It is envisaged that key locations and installations such as electrical substations and train stations for Line 2 East Extension shall be equipped with SCADA and the same shall cover the various sub-station electrical facilities and their respective distribution feeders. Likewise, the SCADA system for the new stations shall monitor important electrical loads and systems in the stations.