



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF BUDGET AND MANAGEMENT
 GENERAL SOLANO STREET, SAN MIGUEL, MANILA

SUPPLEMENTAL/BID BULLETIN (SBB) NO. 1

This SBB No. 1 dated August 30, 2019 for the Project, **“Supply, Delivery, Installation, Testing, and Commissioning of Structured Cabling with Wired and Wireless Network Solution, Public Address System and IP-CCTV for the DBM Arcache Building,”** is issued to clarify, modify or amend items in the Bidding Documents. Accordingly, this shall form an integral part of said Documents.

PARTICULARS	CLARIFICATION/AMENDMENTS																								
<p>Section I. Invitation to Bid</p> <p style="text-align: center;">XXXX</p> <p>2. In view of the failure of the first bidding, the DBM now invites bids for the Project, “Supply, Delivery, Installation, Testing and Commissioning of Structured Cabling with Wired and Wireless Network Solution, Public Address and IP-CCTV for the DBM Arcache Building.” Delivery of the Goods shall be in accordance with the Delivery Schedule under Section VI. Schedule of Requirements. Bidders should have completed, within two (2) years from the date of submission and receipt of bids, a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II. Instructions to Bidders.</p> <p style="text-align: center;">XXXX</p> <p>Section III. Bid Data Sheet</p> <p style="text-align: center;">XXXX</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">ITB Clause</th> <th style="width: 85%;">Specification</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">12.1(a)(ii)</td> <td>The bidder’s SLCC similar to the contract to be bid should have been completed within two (2) years prior to the deadline for the submission and receipt of bids.</td> </tr> </tbody> </table> <p style="text-align: center;">XXXX</p> <p>Section VI. Schedule of Requirements</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Item</th> <th style="width: 40%;">Description</th> <th style="width: 20%;">Quantity</th> <th style="width: 30%;">Contract Duration</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2</td> <td>Supply, Delivery, Fabrication, and</td> <td></td> <td></td> </tr> </tbody> </table>	ITB Clause	Specification	12.1(a)(ii)	The bidder’s SLCC similar to the contract to be bid should have been completed within two (2) years prior to the deadline for the submission and receipt of bids.	Item	Description	Quantity	Contract Duration	2	Supply, Delivery, Fabrication, and			<p>Section I. Invitation to Bid</p> <p style="text-align: center;">XXXX</p> <p>2. In view of the failure of the first bidding, the DBM now invites bids for the Project, “Supply, Delivery, Installation, Testing and Commissioning of Structured Cabling with Wired and Wireless Network Solution, Public Address and IP-CCTV for the DBM Arcache Building.” Delivery of the Goods shall be in accordance with the Delivery Schedule under Section VI. Schedule of Requirements. Bidders should have completed, within two (2) FIVE (5) years from the date of submission and receipt of bids, a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II. Instructions to Bidders.</p> <p style="text-align: center;">XXXX</p> <p>Section III. Bid Data Sheet</p> <p style="text-align: center;">XXXX</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">ITB Clause</th> <th style="width: 85%;">Specification</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">12.1(a)(ii)</td> <td>The bidder’s SLCC similar to the contract to be bid should have been completed within two (2) FIVE (5) years prior to the deadline for the submission and receipt of bids.</td> </tr> </tbody> </table> <p style="text-align: center;">XXXX</p> <p>Section VI. Schedule of Requirements</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Item</th> <th style="width: 40%;">Description</th> <th style="width: 20%;">Quantity</th> <th style="width: 30%;">Contract Duration</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2</td> <td>Supply, Delivery, Fabrication, and</td> <td></td> <td></td> </tr> </tbody> </table>	ITB Clause	Specification	12.1(a)(ii)	The bidder’s SLCC similar to the contract to be bid should have been completed within two (2) FIVE (5) years prior to the deadline for the submission and receipt of bids.	Item	Description	Quantity	Contract Duration	2	Supply, Delivery, Fabrication, and		
ITB Clause	Specification																								
12.1(a)(ii)	The bidder’s SLCC similar to the contract to be bid should have been completed within two (2) years prior to the deadline for the submission and receipt of bids.																								
Item	Description	Quantity	Contract Duration																						
2	Supply, Delivery, Fabrication, and																								
ITB Clause	Specification																								
12.1(a)(ii)	The bidder’s SLCC similar to the contract to be bid should have been completed within two (2) FIVE (5) years prior to the deadline for the submission and receipt of bids.																								
Item	Description	Quantity	Contract Duration																						
2	Supply, Delivery, Fabrication, and																								

	Installation of Structured Cabling with Wired and Wireless Network Solution		
3	Supply, Delivery, Fabrication, and Installation of IP Closed Circuit Television (CCTV) System	1 lot	30 Calendar Days from approval of shop drawing
4	Supply, Delivery, Fabrication, and Installation of Public Address System		
5	Rough-in and Restoration Works		

	Installation of Structured Cabling with Wired and Wireless Network Solution		
3	Supply, Delivery, Fabrication, and Installation of IP Closed Circuit Television (CCTV) System	1 lot	30 Calendar Days from approval of shop drawing DECEMBER 15, 2019
4	Supply, Delivery, Fabrication, and Installation of Public Address System		
5	Rough-in and Restoration Works		NOVEMBER 30, 2019

Section VII. Technical Specifications

Item	Specification	Bidder's Statement of Compliance
I	MATERIALS/EQUIPMENT COMPLIANCE	
	<u>General Requirements</u>	
	xxx	

Section VII. Technical Specifications

Item	Specification	Bidder's Statement of Compliance
I	MATERIALS/EQUIPMENT COMPLIANCE	
	<u>General Requirements</u>	
	xxx	
	<ul style="list-style-type: none"> • THE SAME IDF/RACK WILL BE USED FOR DATA, VOICE AND IP-CCTV. 	

Supply, Delivery, Fabrication, Installation, Testing and Commissioning of Structured Cabling with Wired and Wireless Network Solution

Description	Specification
	1U Rackmount managed Power Strip, network grade. 12 outlets (6 front/6 rear), right angle, NEMA 6-15R, 15A, 2-pole 3-wire, grounding type receptacles

Supply, Delivery, Fabrication, Installation, Testing and Commissioning of Structured Cabling with Wired and Wireless Network Solution

Description	Specification
Power Distribution Unit	1U Rackmount managed Power Strip, network grade. 12 outlets (6 front/6 rear), right angle, NEMA 6-15R IEC 320 C13 , 15A, 2-pole 3-wire, grounding type receptacles

	<p>Designed for standard 19-inch wide racks</p> <p>15 ft. cord, NEMA 6-20 Plug; with 20A, 5KA, 230V circuit breaker</p>		<p>Designed for standard 19-inch wide racks</p> <p>15 ft. cord, NEMA 6-20 IEC 320 C19 Plug; with 20A, 5KA, 230V circuit breaker</p>
<p>Main Distribution Frame @ server room mezzanine level</p>	<p>Optical Seismic distribution Rack, slidable, multiples of IU frame, 48 LC Fibers, Sliding Tray, Telescopic Rail</p> <p>4-post Seismic Distribution Rack, Steel, Knockdown with adjustable depth, black 28" to 36"x 74" High, 40 RU Complete with horizontal (closed design cover) and Vertical Cable Managers with grounding terminal 6 pcs for #8 wires with surge protected device (SPD).</p>	<p>Main Distribution Frame @ server room mezzanine level</p>	<p>Optical Seismic distribution Rack, slidable, multiples of IU frame, 48 LC Fibers, Sliding Tray, Telescopic Rail</p> <p>4-post Seismic Distribution Rack, Steel, Knockdown with adjustable depth, black 28" to 36"x 74" High, 40 RU Complete with horizontal (closed design cover) and Vertical Cable Managers with grounding terminal 6 pcs for #8 wires with surge protected device (SPD).</p>

r) Technical specification for door access control system are as follows (minimum quantity):

r) Technical specification for door access control system are as follows (minimum quantity):

Description	Specification	Qty
PDU	<p>1U Rackmount managed Power Strip, network grade.</p> <p>8 outlets, NEMA 6-15R, 15A, 2-pole 3-wire, grounding type receptacles</p> <p>Designed for standard 19-inch wide racks</p> <p>15 ft. cord, NEMA 6-20 Plug; with 20A, 5KA, 230V circuit breaker</p>	3 set

Description	Specification	Qty
PDU	<p>1U Rackmount managed Power Strip, network grade.</p> <p>8 outlets, NEMA 6-15R IEC 320 C13, 15A, 2-pole 3-wire, grounding type receptacles</p> <p>Designed for standard 19-inch wide racks</p> <p>15 ft. cord, NEMA 6-20 IEC 320 C19 Plug; with 20A, 5KA, 230V circuit breaker</p>	3 setS

UPS	Uninterruptible Power Supply, 1-Kva minimum, Line-Interactive Sine Wave UPS, 2U Rack mounted, Network Card Options, 8 Outlets; NEMA 6-15R, 2-pole, 3-wire; LCD Display; 230V, 60Hz input with NEMA 6-20P plug	1 set
-----	---	-------

UPS	Uninterruptible Power Supply, 1-Kva minimum, Line-Interactive Sine Wave UPS, 2U Rack mounted, Network Card Options, 8 Outlets; NEMA 6-15R IEC 320 C13, 2-pole, 3-wire; LCD Display; 230V, 60Hz input with NEMA 6-20P plug	1 set
-----	---	-------

Supply, Delivery, Fabrication, Installation, Testing and Commissioning of IP CCTV System

b) Technical specification for CCTV equipment are as follows (minimum quantity):

Description	Specification	Qty.
Branded and brand new Network Video Recorder (NVR)	xxx • Must be Open Network Video Interface Forum (ONVIF) compliant (Profile S/G).	4 units
Branded and brand new Network Outdoor PTZ Camera with 3 channels panoramic camera	xxx • ONVIF compliant (Profile S/G)	As per plan
Branded and brand new Dome Type IP Camera	xxx • ONVIF compliant (Profile S/G)	As per plan

Supply, Delivery, Fabrication, Installation, Testing and Commissioning of IP CCTV System

b) Technical specification for CCTV equipment are as follows (minimum quantity):

Description	Specification	Qty.
Branded and brand new Network Video Recorder (NVR)	xxx • Must be Open Network Video Interface Forum (ONVIF) compliant (Profile S/G S OR G).	4 units
Branded and brand new Network Outdoor PTZ Camera with 3 channels panoramic camera	xxx • ONVIF compliant (Profile S/G S OR G)	As per plan
Branded and brand new Dome Type IP Camera	xxx • ONVIF compliant (Profile S/G S OR G)	As per plan

Supply, Delivery, Fabrication, Installation, Testing and Commissioning of Public Address System

Description	Specification	Qty.
Power Amplifier	• Power Amplifier, 120W, 230V, 60Hz	1 set

Supply, Delivery, Fabrication, Installation, Testing and Commissioning of Public Address System

Description	Specification	Qty.
Power Amplifier	• Power Amplifier, 120W, 230V, 60Hz	1 set

Attached are the Revised Section VI. Schedule of Requirements and the Revised Section VII. Technical Requirements.

Other matters:

- The “No Contact Rule” shall be strictly observed. Bidders are not allowed to call or talk to any member of the Bids and Awards Committee, Technical Working Group or Secretariat effective September 6, 2019 right after the opening of bids.

- For guidance and information of all concerned.


ANDREA CELENE M. MAGTALAS
Director IV
Vice Chairperson, DBM-BAC

Section VI. Schedule of Requirements **(Revised)**

The delivery schedule expressed as weeks/months stipulates hereafter the date of delivery to the project site.

Item	Description	Quantity	Contract Duration	
	The Contractor shall provide the following materials, tools and equipment, manpower, and supervision needed for the project:			
1	Submission of shop drawings for approval of the DBM – Administrative Service	1 lot	5 days from receipt of NTP	
2	Supply, Delivery, Fabrication, and Installation of Structured Cabling with Wired and Wireless Network Solution		December 15, 2019	
3	Supply, Delivery, Fabrication, and Installation of IP Closed Circuit Television (CCTV) System			
4	Supply, Delivery, Fabrication, and Installation of Public Address System			
5	Rough-in and Restoration Works			November 30, 2019
	Testing and Commissioning			November 15-30, 2019 December 2019
6	Conduct of project turn-over training			
7	Warranty Response time for the repair and replacement of defective parts/unit			One (1) year from acceptance of the Project Within 4 hours from verbal or written notice from DBM

I hereby certify to comply and deliver all the above requirements.

Name of Company/Bidder

Signature over Printed Name of Representative

Date

Section VII. Technical Specifications **(Revised)**

Bidders must state here either "Comply" or any equivalent term in the column "Bidder's Statement of Compliance" against each of the individual parameters of each "Specification."

Item	Specification	Bidder's Statement of Compliance
I	MATERIALS/EQUIPMENT COMPLIANCE	
	<p><u>General Requirements</u></p> <ul style="list-style-type: none"> • Expected project/contract output/outcome: Fully functional Network system, CCTV system, and Public Address system completed within industry standard practices (End to End Solution, including licensed software/application). Hence, the contractor shall provide all the necessary materials, equipment, tools, labor, and supervision to complete the project as intended/expected; • The Contractor shall verify all the quantities of materials and equipment needed to complete the project as intended. • The Contractor shall be responsible for the accuracy and completeness of all items of work, materials, equipment, tools, and labor which shall be covered in his bid; • In case of missing materials or equipment inadvertently not included in the Schedule of Requirement and Technical Specification, the additional materials/equipment shall be supplied, delivered, installed, fabricated, tested and commissioned by the contractor without additional/extra cost to the DBM; • All materials and equipment shall be compatible with DBM existing Network Solution (integration, manageability and routing); 	

	<ul style="list-style-type: none"> • The Structured Cabling/Network Solution, CCTV and Public Address system shall be stand-alone/separate from each other. Hence, there are no connectivity between the Structured Cabling, Network Solution/Equipment, CCTV system, and Public Address System; • The Contractor shall visit the jobsite to familiarize himself with the existing condition prior to submission of bid; • Cabling works shall be tested using certification tool with print out; • Use only one brand for cabling works; • The Contractor shall be accredited installer/supplier of the cable brand. A certificate of authorized dealer/installer shall be submitted to the DBM-AS during contract implementation; • The cost of rough-in, demolition, and restoration works shall be on the account of the contractor; • All rough-in and demolition works shall be supervised by the General Contractor - Dynamic Builders and Construction Co. (Phils), Inc. (DBCCI) - considering that the Arcache Building is still under their warranty; • All restoration works shall only be done by DBCCI. Hence, the cabling contractor shall coordinate and pay DBCCI for the supervision and restoration works of all affected areas. • The contractor must have the following Certified Professionals: (certificates must be submitted in the submission of bid documents and subject for post qualification) <ul style="list-style-type: none"> a. Manufacturer-Certified IP-CCTV Surveillance Administrator and/or Professional; b. Manufacturer-Certified Network Professional; c. Manufacturer-Certified Network Associate. • The same IDF/Rack will be used for Data, Voice and IP-CCTV. • The contractor shall provide training based on the schedule below: 	
--	---	--

Technical Training	Schedule	No. of Participants	Duration
Project Turn-over Training	Three (3) Consecutive Days	At least five (5) participants per conduct	One (1) Batch per day

- The contractor shall issue individual training certificates and training materials for each of the participants. A certificate of acceptance shall be issued by the Director of the Administrative Service.

Supply, Delivery, Fabrication, Installation, Testing and Commissioning of Structured Cabling with Wired and Wireless Network Solution

REFERENCE DRAWINGS:

DRAWING NO	TITLE
AUX 01-B OF 11	VOICE & DATA RISER DIAGRAM
AUX 03-A OF 11	VOICE & DATA SYSTEM LAYOUT-GROUND FLR
AUX 03-B OF 11	VOICE & DATA SYSTEM LAYOUT-MEZZANINE
AUX 04-A OF 11	VOICE & DATA SYSTEM LAYOUT-SECOND FLOOR
AUX 04-B OF 11	VOICE & DATA SYSTEM LAYOUT – THIRD FLOOR
AUX 03-M OF 11	MISCELLANEOUS DETAILS

- Supply and install three (3) empty 63 mm diameter SCH 40, PVC conduits for PLDT, Globe Telecom and Converge from the exterior wall of the Building to the pull boxes and Cabinets allocated for each provider as shown on Drawings AUX 01-B, AUX 03-B and AUX 04-A.
- Supply and installation of FO entrance cables from building exterior wall to the Pull Boxes and related Cabinets shall be responsibility of the respective TELCO Service Providers.
- Supply and install two (2) multimode FO backbone cables from the Service Provider cabinets thru the Main Distribution Frame at the Mezzanine to the Intermediate Distribution Frame, IDF-G, at the Ground Floor. Perform end to end termination and testing of the FO cables.

- d) Supply and install two (2) 63 mm diameter PVC conduit from IDF-G to the Main Distribution Frame (MDF) located at the Mezzanine Floor Server Room.
- e) Supply and install two (2) multimode FO cables from IDF-G to the Main Distribution Frame. Perform end to end termination and testing of the FO cables.
- f) Supply and install three (3) 63 mm diameter PVC conduits from the MDF thru two (2) PB-7 boxes located at Mezzanine and Second Floor to Intermediate Distribution Frame 2 (IDF-2). Two (2) of the conduits shall be spare.
- g) Supply and install FO backbone cables from the MDF to IDF-G and from MDF to IDF-2. Perform end to end termination of the cable, including the required testing.
- h) Construct two (2) 300 mm square x 300 deep Hand hole along Nepomuceno corner Solano Street (Grid lines A and 6-8) as shown on Drawing AUX 03-A OF 11. Cut concrete slab, excavate trench and install three (3) 63 mm diameter PVC conduits, including Risers to the Second Floor and down to the MDF at the Mezzanine Floor. Restore surface to match the existing slab and finish after completion of conduit roughing in. Installation of FO cables will be done by DBM at a later date. Contractor shall provide 30 mm diameter nylon pulling rope in each conduit.
- i) Supply and install two (2) CAT6 plenum UTP cables, 4-pairs 23 AWG from the Server rooms and the respected voice and data outlets beginning Mezzanine to the Third Floor.
- j) Supply, install and terminate 376 duplex voice and data RJ45 modular jack female outlets and associated cover at the rooms from Mezzanine to the Third floor.
- k) Provide and install all the required conduits, boxes and supports (wall and ceiling), as required, to complete the raceways system of the structural cabling.
- l) Perform end to end termination of FO cables including all the required testing, from MDF to IDFs.
- m) Perform all the required testing for the structured cabling.
- n) Submit Shop Drawings for the approval of the Project Manager/Consultant.
- o) Contractor to provide services to obtain the required documentation for the application and approval for the final connection of the communication systems to the respected Telephone Company
- p) Technical specifications of materials are as follows (quantity shall be based on the intention of the plans):

Description	Specification
Voice and Data Port/outlet, Jack, Modular	Jack, Female , RJ45 , Modular, Ethernet 10/100 Base, Cat6, Voice and data

Plug, modular	UTP Plug, modular, RJ45, CAT6
Plate, wall	Cat6 two port wall cover plate, mounted on furniture raceway on wall as shown on plans.
UTP Cables	UTP cable, Cat6, plenum, gray, 23AWG, 4 Pair, Solid Bare Copper, 550MHz, ETL Listed, Unshielded Twisted Pair (UTP), Ethernet Cable
UTP Patch Cord, 6-feet length	UTP Patch Cord, Cat 6 Ethernet Cable, Snagless Patch, 6 Feet – Snagless, RJ45 Computer LAN Network Cord, Blue
UTP Patch Cord, 3-feet length	UTP Patch Cord, Cat 6 Ethernet Cable, Snagless Patch, 3 Feet – Snagless, RJ45 Computer LAN Network Cord, Blue
Power Distribution Unit	<p>1U Rackmount managed Power Strip, network grade.</p> <p>12 outlets (6 front/6 rear), right angle, IEC 320 C13, 15A, 2-pole 3-wire, grounding type receptacles</p> <p>Designed for standard 19-inch wide racks</p> <p>15 ft. cord, IEC 320 C19 Plug; with 20A, 5KA, 230V circuit breaker</p>
Fiber Optic Cable	8 Fiber Indoor/Outdoor Fiber Optic Cable, Multimode, OM3, 62.5/125, Black, OFNR, 4100 MHz @ 850 nm, including end to end termination from MDF to IDFs.
Fiber Optic Patch Cord	LC TO LC Fiber Optic Patch Cord, 40 Gb Multimode OM3, MPO to 8xLC Fiber Optic Cable, 50/125 um, 2-meter LG,
Clean Agent Fire Extinguisher	HCFC 123 with 99.6 – 100% purity, applicable for all classes of fire (ABC) ceiling mounted with steel hangers & brackets.
Grounding wires and conduit	<p>(a) 22 mm² green insulated conductor, TW, GREEN</p> <p>(b) 25mmØ PVC conduit with hangers</p>
Ground Rod Copper Clad	16mmØ x 2400mm (L) with ground clamp connector, exothermic process, resistance reading equivalent or less than 25 ohms
Grounding Terminal Bus @ Server Room	Ground Bus 25mm x 400mm x 10mm (T) copper with isolated insulator with 20pcs. 8mmØ hole in metal box Ga.16 size 200mm (H) x 600mm (L) x 150mm (D) and removal front cover made of clear plastic 1/4" thick size 550mm (L) x 175mm (H).

Main Distribution Frame @ server room mezzanine level	Distribution Rack, slidable, multiples of IU frame, 48 LC Fibers, Sliding Tray, Telescopic Rail Distribution Rack, Steel, adjustable depth, black 28" to 36"x 74" High, 40 RU Complete with horizontal (closed design cover) and Vertical Cable Managers with grounding terminal 6 pcs for #8 wires with surge protected device (SPD).
Intermediate Distribution Frame	Rack, Open frame, Free Standing, fixed, 32" depth, 74" high 19" wide panels for 1U incremental thickness panels, complete with fixing screws depth, black Complete horizontal (closed design cover) and with Vertical Cable Managers with grounding terminal 6 pcs for #8 wires with surge protected device (SPD).
Patch Panel, fiber optic (Main distribution Frame)	12 ports, Rack mounted, 19" Preloaded Fiber Enclosure, 1U, (12) Duplex LC Pair
Raceway, Rectangular	100mm x 50mm x 2438mm (2"x4"x8") Ga. 22 metal raceway with anti-rust coat and final coat of grey.
Pull boxes, Junction Boxes, & Utility Boxes	Sizes as required, Ga 16 min thickness with anti-rust coat and final coat of grey
24-Port 1U Rack-Mount Cat6/Cat5 Patch Panel	19-inch rackmount ready, Solid 16 Gauge Steel with black paint, 24 Flush Mounted RJ45 ports, 110 type punch down termination (color coded), TIA/EIA 568A and 568B Compliant

q) Technical specifications of network equipment are as follows (minimum quantity):

Description	Specification	Qty
Branded and brand new 12 ports 10G SFP+ Switch	<ul style="list-style-type: none"> • Rack-mountable and Stackable Layer 3 switch. • 12 x 10 Gigabit Small Form-Factor Pluggable Plus (SFP+) • Two (2) units of long range transceiver SFP-10G-LR per switch • Ten (10) units of short range transceiver SFP-10G-SR per switch • One (1) unit of Stacking Module per switch • Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP) • Standard 802.1d Spanning Tree support • One (1) unit of Stake wise and stack power cables • Redundant Hot-swappable Power Supply 	2 units

	<p>Branded and brand new Network Switch</p>	<ul style="list-style-type: none"> • 10/100/1000 48 Ethernet Ports • Uplink: 2x10G SFP+ Ports (with SPF+ optic transceiver module SR) • Support both IEEE 802.3af Power over Ethernet (PoE) and IEEE 802.3at PoE+ (up to 30W per port) • Support maximum 24 ports up to 30W (802.3at PoE+) • Support maximum 48 ports up to 15.4W (802.3af PoE) • Total available PoE power 740W • LAN Base feature set • Support FlexStack+ for stacking of up to 8 switches with 80 Gbps of stack throughput 	<p>10 units</p>	
	<p>Branded and brand new WLAN Controller</p>	<ul style="list-style-type: none"> • Digital Network Architecture (DNA) Software Defined Access (SD-Access) Wireless <ul style="list-style-type: none"> a) Enables network access in minutes for any user or device to any application without compromising on security. b) Enables policy-based automation for wired and wireless, automated provisioning of wired and wireless networks, group-based policy for users and connected devices. • DNA Analytics and Assurance <ul style="list-style-type: none"> a) Enables comprehensive network visibility. Capable to collect data from users, devices, and applications to proactively identify problems. Network analytics and automation to increase availability and deliver a better user experience. • Optimized to enable 802.11ac Wave 2 next-generation networks, supporting: <ul style="list-style-type: none"> a) 20-Gbps throughput b) 1500 access points c) 20,000 clients d) 4096 VLANs • Radio Frequency (RF) management <ul style="list-style-type: none"> a) Proactively identifies and mitigates signal interference for better performance. b) Provides both real-time and historical information about RF interference affecting network performance across controllers, through system wide integration with Cisco Clean Air technology. 	<p>2 units</p>	

		<ul style="list-style-type: none"> • Multimode with indoor, outdoor mesh access points <ul style="list-style-type: none"> a) Versatile controller with support for centralized, distributed, and mesh deployments to be used at different places in the network, offering maximum flexibility for medium-sized campus, enterprise, and branch networks. b) Centralized control, management, and client troubleshooting. c) Seamless client access in the event of a WAN link failure (local data switching). d) Highly secure guest access. e) Efficient access point upgrade that optimizes the WAN link utilization. f) Supports corporate wireless service for mobile and remote workers with secure wired tunnels to indoor Cisco Aironet access points supporting Office Extend mode. • Comprehensive end-to-end security <ul style="list-style-type: none"> a) Offers Control and Provisioning of Wireless Access Points (CAPWAP)-compliant Datagram Transport Layer Security (DTLS) encryption on the control plane between access points and controllers across remote WAN links. b) Management frame protection detects malicious users and alerts network administrators. c) Rogue detection for Payment Card Industry (PCI) compliance. d) Rogue access point detection and detection of denial-of-service attacks. • Fault tolerance and high availability <ul style="list-style-type: none"> a) Subsecond access point and client failover for uninterrupted application availability. b) Redundant 1 Gigabit Ethernet/10 Gigabit Ethernet connectivity. c) Solid-state device-based storage - no moving parts. d) Redundant, hot-swappable power supply. e) Enhanced system uptime with fast system restarts. • Enterprise Wireless Mesh that allows access points to dynamically establish 		
--	--	---	--	--

		<p>wireless connections without the need for a physical connection to the wired network.</p> <ul style="list-style-type: none"> • WLAN express setup that simplified GUI wizard for quick setup and intuitive dashboards for monitoring and troubleshooting. • High-performance video stream technology that optimizes the delivery of video applications across the WLAN. • Mobility, security, and management for IPv6 and dual-stack clients <ul style="list-style-type: none"> a) Highly secure, reliable wireless connectivity and consistent end-user experience. b) Increased network availability through proactive blocking of known threats. c) Equips administrators for IPv6 planning, troubleshooting, and client traceability. • Wired/Switching/Routing <ul style="list-style-type: none"> a) IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX specification, 1000BASE-T, 1000BASE-SX, 1000-BASE-LH, IEEE 802.1Q VLAN tagging, and IEEE 802.1AX Link Aggregation. • Wireless Specifications <ul style="list-style-type: none"> a) IEEE 802.11a, 802.11b, 802.11g, 802.11d, WMM/802.11e, 802.11h, 802.11n, 802.11k, 802.11r, 802.11u, 802.11w, 802.11ac Wave1 and Wave2 • Data Request For Comments (RFC) <ul style="list-style-type: none"> a) RFC 768 UDP b) RFC 791 IP c) RFC 2460 IPv6 d) RFC 792 ICMP e) RFC 793 TCP f) RFC 826 ARP g) RFC 1122 Requirements for Internet Hosts h) RFC 1519 CIDR RFC 1542 BOOTP i) RFC 2131 DHCP j) RFC 5415 CAPWAP Protocol Specification k) RFC 5416 CAPWAP Binding for 802.11 • Security Standards <ul style="list-style-type: none"> a) IEEE 802.11i (WPA2, RSN) b) RFC 1321 MD5 Message-Digest Algorithm 		
--	--	---	--	--

		<ul style="list-style-type: none"> c) RFC 1851 ESP Triple DES Transform d) RFC 2104 HMAC: Keyed Hashing for Message Authentication e) RFC 2246 TLS Protocol Version 1.0 f) RFC 2401 Security Architecture for the Internet Protocol g) RFC 2403 HMAC-MD5-96 within ESP and AH h) RFC 2404 HMAC-SHA-1-96 within ESP and AH i) RFC 2405 ESP DES-CBC Cipher Algorithm with Explicit IV j) RFC 2407 Interpretation for ISAKMP k) RFC 2408 ISAKMP l) RFC 2409 IKE m) RFC 2451 ESP CBC-Mode Cipher Algorithms n) RFC 3280 Internet X.509 PKI Certificate and CRL Profile o) RFC 4347 Datagram Transport Layer Security p) RFC 5246 TLS Protocol Version 1.2 <ul style="list-style-type: none"> • Encryption <ul style="list-style-type: none"> a) Wired Equivalent Privacy (WEP) and Temporal Key Integrity Protocol-Message Integrity Check (TKIP-MIC): RC4 40, 104 and 128 bits (both static and shared keys) b) Advanced Encryption Standard (AES): Cipher Block Chaining (CBC), Counter with CBC-MAC (CCM), Counter with Cipher Block Chaining Message Authentication Code Protocol (CCMP) c) Message Authentication Code Protocol (CCMP) d) Secure Sockets Layer (SSL) and Transport Layer Security (TLS): RC4 128-bit and RSA 1024-bit and 2048-bit e) DTLS: AES-CBC f) IPsec: DES-CBC, 3DES, AES-CBC g) 802.1AE MACsec encryption • Authentication, Authorization, and Accounting (AAA) <ul style="list-style-type: none"> a) IEEE 802.1X b) RFC 2548 Microsoft Vendor-Specific RADIUS Attributes 		
--	--	---	--	--

		<ul style="list-style-type: none"> c) RFC 2716 PPP EAP-TLS d) RFC 2865 RADIUS Authentication e) RFC 2866 RADIUS Accounting f) RFC 2867 RADIUS Tunnel Accounting g) RFC 2869 RADIUS Extensions h) RFC 3576 Dynamic Authorization Extensions to RADIUS i) RFC 5176 Dynamic Authorization Extensions to RADIUS j) RFC 3579 RADIUS Support for EAP k) RFC 3580 IEEE 802.1X RADIUS Guidelines l) RFC 3748 Extensible Authentication Protocol (EAP) m) Web-based authentication n) TACACS support for management users • Management <ul style="list-style-type: none"> a) Simple Network Management Protocol (SNMP) v1, v2c, v3 b) RFC 1155 Management Information for TCP/IP-Based Internets c) RFC 1156 MIB d) RFC 1157 SNMP e) RFC 1213 SNMP MIB II f) RFC 1350 TFTP g) RFC 1643 Ethernet MIB h) RFC 2030 SNMP i) RFC 2616 HTTP j) RFC 2665 Ethernet-Like Interface Types MIB k) RFC 2674 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and Virtual Extensions l) RFC 2819 RMON MIB m) RFC 2863 Interfaces Group MIB n) RFC 3164 Syslog o) RFC 3414 User-Based Security Model (USM) for SNMPv3 p) RFC 3418 MIB for SNMP q) RFC 3636 Definitions of Managed Objects for IEEE 802.3 MAUs r) Cisco private MIBs • Management Interfaces <ul style="list-style-type: none"> a) Web-based: HTTP/HTTPS b) Command-line interface: Secure Shell (SSH) Protocol, serial port 		
--	--	---	--	--

		<ul style="list-style-type: none"> • Interfaces and Indicators <ul style="list-style-type: none"> a) 2 x 10 Gigabit Ethernet interfaces b) Small Form-Factor Pluggable (SFP)/Small Form-Factor Pluggable Plus (SFP+) options (only Cisco SFP/SFP+s supported), including S-Class Optics. c) 1 x service port: 1 Gigabit Ethernet port (RJ-45) d) 1 x redundancy port: 1 Gigabit Ethernet port (RJ-45) e) 1 x Cisco Integrated Management Controller port: 10/100/1000 Ethernet f) 1 x console port: Serial port (RJ-45) g) LED indicators: Network Link, Diagnostics 		
	<p>Branded and brand new Wireless Access Point</p>	<ul style="list-style-type: none"> • Flexible radio assignment that allows the access points to intelligently determine the operating mode of serving radios based on the RF environment. The access points can operate in the following modes: <ul style="list-style-type: none"> a) 2.4-GHz and 5-GHz mode: One radio will serve clients in 2.4-GHz mode, while the other serves clients in 5-GHz mode. b) Dual 5-GHz mode: Both radios inside the access point operate on the 5-GHz band, maximizing the benefits of 802.11ac Wave 2 and increasing client device capacity. c) Security Monitoring and 5-GHz mode, One radio will serve 5-GHz clients, while the other is scanning the full spectrum for WIPS attackers, CleanAir interferers, and rogue devices. • Dual 5-GHz radio support that enables both radios to operate in 5-GHz client serving mode, allowing an industry-leading 5.2 Gbps (2 x 2.6 Gbps) over-the-air speeds while increasing client capacity. • Smart antenna connector that provides advanced network design flexibility for high-density and large open-area environments such as auditoriums, libraries, cafeterias, and conference room, allowing two sets of antennas to be connected and active on a single access point. 	<p>As per plan</p>	

		<ul style="list-style-type: none"> • Supporting channels up to 160 MHz wide, Dynamic Bandwidth Selection allows the access point to dynamically switch between 20-, 40-, 80-, and 160-MHz channels, depending on the RF channel conditions, providing the industry's best-performing wireless network. • Optimized access point roaming to ensure that client devices associate with the access point in their coverage range that offers the fastest data rate available. • Zero impact application visibility and control that uses dedicated hardware acceleration to improve the performance of line-speed applications such as Application Visibility and Control. • Auto link aggregation (LAG) allowing both Gigabit Ethernet interfaces to automatically LAG, increasing overall throughput to the access point. • Client Link 4.0 technology to improve downlink performance to all mobile devices, including one-, two-, and three-spatial-stream devices on 802.11a/b/g/n/ac while improving battery life on mobile devices such as smart phones and tablets. • Multipole-Input and Multiple-Output (MIMO) equalization capabilities, which optimize uplink performance and reliability by reducing the impact of signal fade. 802.11n version 2.0, 802.11ac Wave1/Wave2 capabilities: <ul style="list-style-type: none"> a) 4x4 MIMO with three spatial streams b) Maximal Ratio Combining (MRC) c) 802.11n/802.11ag/802.11ac beamforming d) 20- /40-/80- /160-MHz channels e) PHY data rates up to 450 Mbps (40 MHz with 5 GHz)/1.3 Gbps (80 MHz in 5GHz/ 5.2 Gbps. f) Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) g) 802.11 Dynamic Frequency Selection (DFS) h) Cyclic Shift Diversity (CSD) support • 1.4.10 Integrated antenna, flexible radio (either 2.4 GHz or 5 GHz) <ul style="list-style-type: none"> a) 2.4 GHz, gain 4 dBi, internal antenna, omnidirectional in azimuth. 			
--	--	---	--	--	--

		<ul style="list-style-type: none"> b) 5 GHz, gain 6 dBi, internal directional antenna, elevation plane beamwidth 90°. c) Dedicated 5 GHz radio, gain 5 dBi, internal antenna, omnidirectional in azimuth. • System memory <ul style="list-style-type: none"> a) 1024 MB DRAM b) 256 MB flash • Interfaces and Indicators <ul style="list-style-type: none"> a) 2x100/1000BASE-T autosensing (RJ-45) b) Management console port (RJ-45) c) USB 2.0 (enabled via future software) d) Status LED indicates boot loader status, association status, operating status, boot loader warnings, boot loader errors. 		
	<p>Branded and Brand new Uninterruptable Power Supply</p>	<ul style="list-style-type: none"> • 2100 Watts/ 3000VA, Input / Output 220V, 2U rack mountable UPS • LCD status Display that will provide key UPS status at glance • Automatic voltage regulation the gives higher application availability by correcting low and high voltage conditions without using the battery • Power conditioning that will protect connected loads from surges, spikes, lightning, and other power disturbance • Audible alarms to know if the unit is on battery, if the battery is low or in there is an overload condition. • Resettable circuit breakers that enables a quick recovery from overload events. • Battery failure notification that will provide early-warning fault on batteries enabling timely preventive maintenance. • Hot-swappable batteries to ensure uninterrupted power to protect equipment while batteries are being replaced. 		
<p>q) Scope of work for door access control system are as follows (minimum quantity):</p>				

- a. Supply and install conduits, boxes and related supports for the Door Access Control System from the Server Room DACS panel at the Mezzanine Floor to each respected location of door access of Ground thru Third Floors, as shown on the above listed reference drawings.
 - b. At the Ground Floor, DACS conduits and wires shall be homerun to the DACS Panel located at that floor and connected to the IDF at the Server Room, also at the Ground Floor.
 - c. At the Mezzanine, Second and Third Floors, DACS conduits and wires shall be homerun to the DACS Panels located at the Mezzanine and Second Floors and connected to the IDF at the DBM Server Room located at the Mezzanine.
- r) Technical specification for door access control system are as follows (minimum quantity):

Description	Specification	Qty
DACs PANEL /CONTROLLER	<ul style="list-style-type: none"> • Unlimited Door Time Zones (20 zones per time zone) • 256 User Time Zones • 32 One-Time Special Event Door Time Zones (single zone) • 50 Door/User Holiday Groups <p>Users:</p> <ul style="list-style-type: none"> • Holds 5,000 cardholders minimum <p>Events: 5,000 events Minimum</p> <p>Display:</p> <ul style="list-style-type: none"> • 2 line x 16 character LCD Display • 1 heartbeat LED • 1 on/offline indication LED • 2 power LEDs • 3 relay output indication LEDs • 2 reader LEDs • 2 network LEDs <p>Time:</p> <ul style="list-style-type: none"> • Maintains up to 1 month without power connection • Automatic DST switch 	19 sets

		<p>Communication:</p> <ul style="list-style-type: none"> Between each controller and Access Control Management web server: Ethernet 10/100 Mbps <p>Power Input:</p> <ul style="list-style-type: none"> 1 x RJ45 Power Over Ethernet (PoE) Port – IEEE 802.3af PoE standard (15.4 W) 	
	COMPUTER SERVER, MONITOR & PRINTER	<ol style="list-style-type: none"> 8th generation Intel Core i7 – 3.2 GHZ Processor 16GB DDR4 2133/2400MHZ memory 2 Terabyte Solid State Hybrid Drive PCIe Quad Monitor Video Card 6GB gddr5 Digital Video Disc Drive DVD-RW 24X SATA 17" LED Monitor USB Keyboard and Mouse 10/100/1000 Gigabit Ethernet Windows 10 Professional Video Management Colored printer 	1 set
	DOOR ACCESS BIOMETRIC READER DEVICE	<p>Capacity</p> <ul style="list-style-type: none"> Fingerprint: 4000 Face: 2,000 Card: 10,000 <p>Display:</p> <ul style="list-style-type: none"> 2.8 Inch TFT-LCD Touch Screen <p>Communication:</p> <ul style="list-style-type: none"> Ethernet, RS 232, RS485, Input and Output, USB Host Power 12V DC, 3A power adapter (Can also be powered using PoE splitter) <p>Environment:</p> <ul style="list-style-type: none"> Operating Temperature: 14° F to 122° F (-10° C to 50° C) 	38 sets

		Operating Humidity: 20% to 80% Dimensions	
		Supported Card Formats ID Card 125 KHz	
DOOR MAGNETIC SWITCH	<ul style="list-style-type: none"> • Energy: 490mA Auto-Sensing 12-24VDC (Base unit, max at 12VDC) • Strength: Up to 1,200lbf Holding Force • Mode: Fail-Safe • Fire-Rated: CAN/ULC S104 UL 10C 1-1/2-Hour • Monitoring: Local & Remote Relay Outputs 	19 sets	
PDU	<p>1U Rackmount managed Power Strip, network grade.</p> <p>8 outlets, IEC 320 C13, 15A, 2-pole 3-wire, grounding type receptacles</p> <p>Designed for standard 19-inch wide racks</p> <p>15 ft. cord, IEC 320 C19 Plug; with 20A, 5KA, 230V circuit breaker</p>	3 sets	
UPS	Uninterruptible Power Supply, 1-Kva minimum, Line-Interactive Sine Wave UPS, 2U Rack mounted, Network Card Options, 8 Outlets; IEC 320 C13, 2-pole, 3-wire; LCD Display; 230V, 60Hz input with NEMA 6-20P plug.	1 set	

Supply, Delivery, Fabrication, Installation, Testing and Commissioning of IP CCTV System

REFERENCE DRAWINGS:

DRAWING NO	TITLE
AUX 02-A OF 11	CCTV RISER DIAGRAM
AUX 06-B OF 11	CCTV, 3 RD FLOOR
AUX 06-A OF 11	CCTV, 2 ND FLOOR
AUX 05-B OF 11	CCTV, MEZZ. FLOOR
AUX 05-A OF 11	CCTV, GROUND FLOOR

- a) Installation of all necessary materials and equipment as per plan

b) Technical specification for CCTV equipment are as follows (minimum quantity):

Description	Specification	Qty.
Branded and brand new Network Video Recorder (NVR)	<ul style="list-style-type: none"> • Capable to start the recording in response to situation triggered by motion detection. • Supports multiple Video Content Analytics (VCA) events. • Must be Open Network Video Interface Forum (ONVIF) compliant (Profile S or G). • Must have a capability to export video to various formats (e.g. AVI, MP4, MJPEG). • Rack-mountable chassis. • Up to thirty two (32) units of IP Camera per NVR can be connected. • Supports decoding format H.265, H.265+, H.264, H.264+ and MPEG4 • Full channel recording at up to 12MP resolution. • Should have 2 Gigabit Ethernet network interfaces. • Should have VGA and HDMI video interfaces. • Should have USB 2.0 and USB 3.0 interfaces. • Hard Disk Drive (HDD) hot swap with RAID0, RAID1, RAID5, RAID6 and RAID10 storage scheme configurable. • Up to 8 Serial Advanced Technology Attachment (SATA) interfaces and 1 eSATA for HDD connection. • Eight (8) x 10 TB Enterprise Grade Hard Disk Drive (HDD) for each NVR, HDD must be designed to ensure seamless video footage capture in 24x7 surveillance workloads. • AC Input Voltage: 100 – 240 V AC, 50 to 60 Hz. 	4 units
Branded and brand new Network Outdoor PTZ Camera with 3 channels panoramic camera	<ul style="list-style-type: none"> • PTZ Camera: <ol style="list-style-type: none"> a) 2MP HD camera that can provide sharp images even in low-light environment b) Image Sensor of 1/2.8" progressive scan CMOS c) 10 x optical zoom and 8 x digital zoom d) 1920X1088 (1080p) @ 30 frames per second (fps) e) 50 meters IR Range f) Digital Wide Dynamic Range g) Support PTZ Linkage 	As per plan

		<ul style="list-style-type: none"> • Three (3) Channel Panoramic Camera: <ul style="list-style-type: none"> a) 2MP HD camera that can provide sharp images even in low-light environment b) 1080p Resolution @ 30 fps c) Image Sensor of 1/2.8" progressive scan CMOS d) 20 meters IR Range e) Digital Wide Dynamic Range • Video Compression: H.265+, H.265, H.264+, H.264, MJPEG • Video Bitrate: 256 Kbps to 8192 Kbps • 3D Digital Noise Reduction • ONVIF compliant (Profile S or G) • Weather proof with Ingress Protection (IP) rating 66 • Impact Protection (IK) rating 10 • 12 VDC Power over Ethernet (POE+ 802.3at) maximum of 27W 		
	Branded and brand new Dome Type IP Camera	<ul style="list-style-type: none"> • 2MP HD camera that can provide sharp images even in low-light environment • 1080p Resolution @ 30 fps • Video Bitrate: 256 Kbps to 8192 Kbps • 2.8 to 12 mm Vari-Focal Lens • Video Compression: H.265+, H.265, H.264+, H.264, MJPEG • 3D Digital Noise Reduction • 30 meters IR Range • 120 dB Wide Dynamic Range (WDR) • ONVIF compliant (Profile S or G) • Weather proof with Ingress Protection (IP) rating 66 • Impact Protection (IK.) rating 10 • 12 VDC and Power over Ethernet (PoE) (802.3af) • Behavior Analysis: Intrusion detection, Unattended baggage/Object removal detection 	As per plan	
	Branded and brand new 24 ports Power over Ethernet (POE) Network Switch	<ul style="list-style-type: none"> • Rack-mountable Layer 2 switch. • 4 x 10 Gigabit Small Form-Factor Pluggable Plus (SFP+) uplinks with transceiver. • Twenty-four (24) 10/100/1000 Ethernet Ports. • Support both IEEE 802.3af Power over Ethernet (PoE) and IEEE 802.3at PoE+ (up to 30W per port). • Perpetual PoE support with a power up to 740W. • Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP) • Standard 802.1d Spanning Tree support 	4 units	

			<ul style="list-style-type: none"> Should be compatible with DBM existing Network Solution (integration, manageability and routing). 		
		Branded and brand new 12 ports 10G SFP+ Switch	<ul style="list-style-type: none"> Rack-mountable and Stackable Layer 3 switch. 12 x 10 Gigabit Small Form-Factor Pluggable Plus (SFP+) Two (2) units of long range transceiver SFP-10G-LR per switch Ten (10) units of short range transceiver SFP-10G-SR per switch Two (2) units of Stacking Module per switch Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP) Standard 802.1d Spanning Tree support Two (2) units of Stackwise and stackpower cables Redundant Hot-swappable Power Supply Should be compatible with DBM existing Network Solution (integration, manageability and routing). 	2 units	
		Branded and brand new 55 inch Digital Signage TV	<ul style="list-style-type: none"> Ultra HD Resolution (3840x2160) Brightness: 450cd/m2 Panel Technology: In-Plane Switching (IPS) Internal Memory: 8GB (System 4GB + Available 4GB) Connectivity Input: HDMI /HDCP2.2, DP /HDCP1.3, RGB/DVI HDTV Formats: 720p, 1080i, 1080p, 2160p Power Supply: 100-240V~, 50/60Hz Quick lock push Video Wall Mounting System 	3 units	
		Branded and brand new Client Workstation that are capable to operate 24/7	<ul style="list-style-type: none"> 8th generation Intel Core i7 - 3.2 GHZ Processor. 16GB DDR4 2133/2400MHz memory. 2 Terabyte Solid State Hybrid Drive. PCIe Quad Monitor Video Card 6GB GDDR5 Digital Video Disc Drive DVD-RW 24X SATA 24" LED Monitor USB Keyboard and Mouse 10/100/1000 Gigabit Ethernet Windows 10 Professional 64 bit Video Management Software 	4 sets	
		Branded and brand new Keyboard,	<ul style="list-style-type: none"> USB KVM cables Standard Keyboard Layout Form Factor: 1U 17" Rackmount LED Monitor 	1 unit	

	Video, Mouse (KVM) Console	<ul style="list-style-type: none"> • Graphics display resolution of at least 1366 X 768 • On Screen Display (OSD) menu • Video – Standard VGA with resolution of at least 1280x1024 WXGA 	
	Other required materials	<ul style="list-style-type: none"> • Four (4) units of 24 ports Cat6 Rackmountable Patch Panel including the patch cables • Four (4) units of 12 ports Fiber Patch Panle with Multi-mode LC couplers • One (1) unit of 24 ports Rackmountable Fiber Patch Panel with LC couplers (Single-mode and Multi-Mode) • Two (2) units of 2 screen monitor stand. • Wires/cable and termination such as Fiber Optic Cable (OM3 Multi-Mode, 4-core), HDMI/VGA cables, UTP Cable Category 6, RJ 45, terminal box and keystone jack. • Roughing-in materials such as cable trays, cable ties, moldings, EMT pipes, connectors, junction boxes, hangers and support. 	As per plan

Supply, Delivery, Fabrication, Installation, Testing and Commissioning of Public Address System

AUX 07-A OF 11	PUBLIC ADDRESS AND BACKGROUND GROUND FLOOR LAYOUT
AUX 07-B OF 11	PUBLIC ADDRESS AND BACKGROUND LAYOUT- MEZZANINE FLOOR
AUX 08-A OF 11	PUBLIC ADDRESS AND BACKGROUND LAYOUT- 2 ND FLOOR
AUX 08-B OF 11	PUBLIC ADDRESS AND BACKGROUND LAYOUT- 3 RD FLOOR

- a) Supply and install conduits, boxes and related supports for the PA & BGM systems, from the Server Rooms to the location of each speaker, as shown on the above-listed referenced drawings.
- b) The above listed reference drawings are diagrammatic and do not show all the required conduit/raceway accessories. Contractor is responsible to supply and install all the required Pull and Junction boxes that are necessary to complete the raceway for the PA &BGM system.
- c) Supply and install shielded twisted pair # 16 AWG TF wires from Server Rooms PA & BGM Rack to the location of each

speakers as shown on the above referenced corresponding drawings.

- d) Supply and install conduits and wires to interface PA&BGM with the Fire Alarm Control Panel.
- e) Technical specification for Public Address equipment are as follows (minimum quantity):

Description	Specification	Qty.
Speaker	<ul style="list-style-type: none"> • Ceiling Speaker, 6-inch, 6W white, Wide-Dispersion Coaxial driver, 140deg. Coverage, 16 Ohm Input, UL-2043 	116 pcs
UPS	<ul style="list-style-type: none"> • Smart UPS, 8000 VA, Rack Mounted, LCD, 230 V, 30 min /back-up time 	1 set
Amplifier	<ul style="list-style-type: none"> • System Management amplifier, 360 W/ch, 230V, 60Hz, 	1 set
Extension Amplifier	<ul style="list-style-type: none"> • System Management extension amplifier, 360 W/ch, 230V, 60Hz, 	1 set
Stereo Player	<ul style="list-style-type: none"> • USB/SD/MMC/CD/FM /Bluetooth Stereo media player 	1 set
Monitor Panel	<ul style="list-style-type: none"> • Monitor Panel Aural/visual monitoring, Channel selector switch, Monitor volume control, Watt meter, Line voltage selector switch, 25 V (625 Ω), 50 V (2.5 kΩ), 70 V (5 kΩ), 100 V (10 kΩ) switchable, rack mounted, 230V, 60Hz 	1 set
Volume Control , Paging Console	<ul style="list-style-type: none"> • Microphone, Paging Desktop, with push-Talk/Lock Button 	1 set
Remote Microphone	<ul style="list-style-type: none"> • Remote Microphone 	1 set

Notes: The ocular site visit is scheduled after the Pre-bid conference. Non-Disclosure Agreement will be provided to the prospective bidder during the Pre-bid conference.

I hereby certify to comply with all the above Technical Specifications.

Name of Company/Bidder

Signature over Printed Name of Representative

Date