

SUPPLEMENTAL/BID BULLETIN

BID BULLETIN NO. 1

30 November 2023

Name of Project: **Procurement of Learning Systems for TESDA Learning Center 4.0 Ready – Re-bidding**

Pursuant to Section 22.5 of the Revised Implementing Rules and Regulations of Republic Act No. 9184, this Bid Bulletin No. 1 is being issued to further clarify the provisions in the Bidding Documents with reference to the queries/concerns raised by the bidders.

A. CLARIFICATION ON THE INVITATION TO BID

1. On Lot 14 (Paragraph of the Invitation to Bid)

ORIGINAL			AMENDED		
LOT NO.	LOT TITLE	ABC (IN PHILIPPINE PESO)	LOT NO.	LOT TITLE	ABC (IN PHILIPPINE PESO)
14	Electronic kits and sound system	21,045,040.91	14-A	Electronics Prototyping Set	19,125,921.20
			14-B	Sound System	1,919,119.71

2. On the applicable fees of the Bidding Documents (Paragraph 5 of the Invitation to Bid)

ORIGINAL			AMENDED		
Lot No.	ABC (in Philippine Peso)	Cost of Bidding Documents (in Philippine Peso)	Lot No.	ABC (in Philippine Peso)	Cost of Bidding Documents (in Philippine Peso)
14	21,045,040.91	25,000.00	14-A	19,125,921.20	25,000.00
			14-B	1,919,119.71	5,000.00

B. CLARIFICATION ON THE BIDDING DOCUMENTS

1. On the number of lots (Clause 1 of Section II. Instructions to Bidders)

ORIGINAL	AMENDED
<p>The Procuring Entity, TESDA wishes to receive Bids for the Procurement of Learning Systems for TESDA Learning Center 4.0 Ready - Re-Bidding with identification number TESDA-CO-2023-10.</p> <p>The Procurement Project (referred to herein as “Project”) is composed of twenty-two (22) lots, the details of which are described in Section VII (Technical Specifications).</p>	<p>The Procuring Entity, TESDA wishes to receive Bids for the Procurement of Learning Systems for TESDA Learning Center 4.0 Ready - Re-Bidding with identification number TESDA-CO-2023-10.</p> <p>The Procurement Project (referred to herein as “Project”) is composed of twenty-three (23) lots, the details of which are described in Section VII (Technical Specifications).</p>

2. On the change in the delivery period

- No changes in the delivery period shall be made since it may hamper the delivery of services by the Regional TVET Innovation Centers (RTICs) to their stakeholders. The winning bidder has to deliver the goods within thirty (30) calendar days from receipt of the Notice to Proceed.

3. On the nature of Single Largest Completed Contract (SLCC)

ORIGINAL			AMENDED		
LOT NO.	LOT NAME	NATURE OF SLCC	LOT NO.	LOT NAME	NATURE OF SLCC
14	Electronic kits and sound system	Contract similar to the supply and/or set-up of electronic components, sound system and/or tools and equipment	14-A	Electronics Prototyping Set	Contract similar to the supply of electronic components and/or devices
			14-B	Sound System	Contract similar to supply and set-up of sound system

LOT NO.	LOT NAME	NATURE OF SLCC	
		ORIGINAL	AMENDED
4	Metal Fabrication Equipment	Contract similar to the supply/provision of machining equipment and/or general machinery	Contract similar to the supply/provision of machining equipment, CNC machines, and/or general machinery

4. On the amount of bid security

Lot No.	Title	Cash, Cashier's/ Manager's Check, Bank Draft/ Guarantee or Irrevocable Letter of Credit (2% of ABC)	Surety Bond callable upon demand issued by a surety or insurance company duly certified by the Insurance Commission (5% of ABC)
ORIGINAL			
14	Electronic kits and sound system	₱420,900.82	₱1,052,252.05
AMENDED			
14-A	Electronics Prototyping Set	₱382,518.42	₱956,296.06
14-B	Sound System	₱38,382.39	₱95,955.99

5. On the training requirements and arrangements

- With regard to the two-week delivery lead time for training and in cases of multiple recipients, TESDA will assign one of the recipients to be the venue of the training for all recipients.
- In terms of the definition of “familiarization” in Lot 19, it is not a refresher course. Based on description, training should be applied in the context of data analytics for office productivity software and promotional materials development for digital creative software.
- In relation to the number of attendees and whether training is conducted per lot or by region, the ten (10) day or two (2) week training is conducted per lot for a maximum of ten (10) attendees.

6. On the technical specifications

- As for Item No. 05-004 under Lot 4 - Metal Fabrication Equipment, the Technical Data Sheet is attached hereto.
- For clarification on the topics covered in Lot 19, the bidder should consider the listed topics and the provisions stated under the Scope of Work in the training

component. Moreover, the bidder may also propose additional topics they deemed appropriate.

➤ Kindly refer on the revised portions of Section VII of the Bidding Documents incorporating the amendments on the following:

- Item Codes 03-003 and 03-004 in Lot 3
- Revised Annex D4
- Item Code 08-001 in Lot 7
- Item Code 09-003 in Lot 9
- Item Codes 13-001, 13-003 and 13-004 in Lot 13
- Revised Annex D14
- Item Codes 14-001, 14-002 and 14-009 under Lot 14
- Revised Annex D19

7. On the proposal benefitting TESDA

➤ There is no need to change the agency specifications of Item Code 07-001 Automatic Production Line Trainer, Item Code 03-002 CNC Lathe Performance Turning Center, and Item Code 03-003 CNC Lathe Machine since the essentials and minimum requirement are reflected in the agency specifications. Nonetheless, bidders can offer higher or better technical specifications that are advantageous to the project.

8. On the suggested topics for Lot 11 - Robot Station Simulator

➤ The requested inclusion pertaining to operation of the robot arm is implied to be the basic function of the robot arm as indicated in the agency technical specifications.

However, in terms of the technical specifications, the suggestion of the potential bidder lacks information on the basic features and components that merits consideration such as:

- Parts palletizing module
- drawing puzzle module,
- tracing module,
- Computer stations for programming and simulation among others.

9. On the request for specific location for the installation of the LED Wall

➤ We can only provide the technical drawing of the building. However, the space requirement of the LED wall was considered. The technical plans are attached hereto.

10. On the Certificate of End of Life (EOL) Service from Manufacturer (5 years)

- Yes, it's an after-sales support but it is not necessarily covered by warranty as long as the parts and service are available within 5 years after delivery

For the information and guidance of all concerned.



DDG ANICETO D. BERTIZ III
Chairperson
Bids and Awards Committee – A

REVISED**TECHNICAL SPECIFICATION**

Name of The Learning System	CNC Lathe Machine
Item Code	03-003
Technology Area(s)	CNC Machines

SPECIFICATIONS:

Control	G-Code/Conversational type, support remote monitoring, Wired and/or WiFi connection
Swing over bed	Φ550mm
Max turning diameter	Φ320mm or bigger
Max turning length	475mm or bigger
Spindle bore diameter	76mm or bigger
Bar capacity	Ø65 mm
Spindle Power	15kw (20.1 hp)
Spindle Nose	A2-6
Spindle Speed	4000rpm
X Travel	215mm and above
Z Travel	475mm
Chuck	8" - 10" hollow hydraulic
Tool Capacity	12 position
Tool Indexing Time	0.5 sec/pos
Turning Tool Size:	25 x 25 mm
Max Boring Tool	Φ32 mm

Diameter	
Max.speed of Driven tools	6000 rpm
Max. drilling	Φ16
Max. slotting	Φ20
Rapid traverse X	24 m/min
Rapid traverse Z	30 m/min
Feeding speed	1-8000 mm/min
Machine Dimension (LxWxH)	4160 x 1825 x 1825 mm
Accessories	8" - 10" Hollow Hydraulic Chuck 1 Set Soft Jaw
	Hollow Hydraulic Cylinder
	Hydraulic Tailstock
	Auto Swing Tool Setter
	Automatic Parts Catcher
	Bar Feed Interface
	MPG
	Air Conditioner for Electrical Cabinet
	Auto Chip Conveyor & Chip Chart
	Auto Oil Lubrication System
	Tri-Color Light

	Air Gun
	Door Lock Switch
	Lighting Lamp
	Full Enclosure Splash Guard
	Telescopic Covers
Power Requirements:	Single-phase/3 phase 220V, with breaker and AVR system
Space requirement	Height should not be greater than 2.5m and width/length should not be greater than 4m (so that there will be no issue during ingress)
Others	Laptop with necessary application for design and control management
Consumables	2 Units Mild Steel
	2 Units Stainless Steel
Learning topics	<p>I. Tooling Basics</p> <ol style="list-style-type: none"> 1. Describe machining and turning tools 2. Describe different uses for cutting tools 3. Explain how cutting tools are classified 4. Describe how cutting tools are used in manufacturing 5. Describe how to select a cutting tool 6. Describe the machine operator's responsibility with cutting tools <p>II. Tool Materials</p> <ol style="list-style-type: none"> 1. Provide a brief history of materials used in cutting tools 2. Describe the five materials used in modern cutting tools 3. Describe coating materials used for cutting tools <p>III. Tool Selection and Tool Life</p> <ol style="list-style-type: none"> 1. Describe the variable that affects cutting tool life 2. Describe common defects found in worn cutting tools

	<p>IV. Turning Tools and Tool Holders</p> <ol style="list-style-type: none"> 1. Describe the turning process and lathes 2. Describe two types of turning tools 3. Describe two types of indexable tool holders 4. Describe tool holder components 5. Describe non-indexable turning tools <p>V. Insert Tool holder and boring bar identification and selection</p> <ol style="list-style-type: none"> 1. Describe two organizations responsible for maintaining turning tool standards 2. Describe how identification codes are used for turning tools 3. Describe how to determine the geometric features of an insert 4. Describe how to determine the physical features of an insert 5. Describe how to identify a tool holder 6. Describe how to identify a boring bar <p>VI. Proper Care</p> <ol style="list-style-type: none"> 1. Describe the importance of selecting the correct tool holder 2. Describe the importance of using the correct insert 3. Describe the proper maintenance of turning tools <p>VII. Equipment Assembly</p> <ol style="list-style-type: none"> 1. Describe how to install an indexable insert into a tool holder with a screw 2. Describe how to install an indexable insert into a tool holder with a clamp 3. Describe how to install a round shank tool holder into a mounting block 4. Describe how to install a square shank tool holder in a mounting block 5. Describe how to mount a square shank tool holder directly into a turret
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Other requirements:

- Proof of extensive local service support (provide an organizational chart of the existing service staff, including certification from manufacturer)
- Certificate of authority to sell from the manufacturer or local distributor/reseller

- Certificate to conduct after-sales service and supply of spare parts from the manufacturer.

Sample Image:



Picture for reference only

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

_____ Name of Company/Bidder	_____ Signature over Printed Name of Authorized Representative	_____ Date
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REVISED**TECHNICAL SPECIFICATION**

Name of The Learning System	CNC Milling Machine
Item Code	03-004
Technology Area(s)	CNC Machines

SPECIFICATIONS:

Control	G-Code/Conversational type, support remote monitoring, Wired and/or WiFi connection
Table size	1000 x 500 mm or bigger
T slot (width x number x distance)	18 x 5 x 100mm
Max load	600 - 650 kg
X Travel	900 mm
Y Travel	500 mm
Z Travel	510-650 mm
Spindle nose to table	30-680mm
Spindle center to column	585mm
Spindle taper and diameter	BT40

Spindle speed 10,000rpm	10,000 rpm
Rapid feed	36m/min.
Cutting speed	1-10000 mm/min. or higher
Arm Tool changer	Standard
No. of tools	24
Max. tool length	300mm
Max. diameter	78mm/ 120mm
Pocket positioning time	1.6 - 1.8 sec.
Positioning accuracy	$\pm 0.003-0.01/300$
Repeatability accuracy	$\pm 0.003-0.007$
Coolant tank capacity	130 litres
Air pressure	0.54 - 0.6 Mpa
Airflow rate	130 litres/min

Power Requirements:	Single-phase/3 phase 220V, with breaker and AVR system
Space requirement	Height should not be greater than 2.5m and width/length should not be greater than 4m (so that there will be no issue during ingress)
CNC Control eLearning Courseware	Covers vital CNC topics including CNC mill operation, CNC program operation, and CNC turning operation with the following objectives: <ul style="list-style-type: none"> a. how to use the HMI controls to navigate system screens b. how to jog a CNC machine axis c. how to set up and operate a CNC mill d. the operation of the canned drill cycle e. the axis movements of a CNC lathe f. how to locate and set workpiece zero on a CNC lathe
Accessories	CNC Control Module
	Z axis servo motor with brake
	Full enclosed machine, splash guard with top roof
	Telescopic guards for three axes
	Belt drive Spindle 10,000rpm, BT40
	Rigid tapping
	Ethernet, CF card and USB interface

	LCD Display
	Automatic lubrication unit
	Coolant system
	Oil separation
	Air-condition for electrical cabinet
	Spindle taper air blow
	Cutting air blast device
	LED Working lamp
	End of program light
	Electronic Hand wheel (MPG)
	Levelling bolts and blocks
	Handy coolant gun and Air gun
	Chip flushing device

	Tool Box
	Operation Manual
Air compressor	<p>Air Tank Volume: 150 Litres Air Displacement: 14 cfm Max Working Pressure: 150/10 psi/bar Oil/Oil Free Oil Motor (HP): 3.0 Input Voltage: 230 V Watts: 2250 W Wheel Mounted: No Volts: 230 V</p>
Tooling package	<p>5 x BT40 ER32 collet chucks</p> <hr/> <p>10 x Pull Studs</p> <hr/> <p>15 pcs ER32 collet set</p> <hr/> <p>1 x 100mm Face mill 45 deg, BT40 arbor & 20 inserts</p> <hr/> <p>1 x set HSS End Mills</p> <hr/> <p>1 x set HSS Drill bits</p> <hr/> <p>1 x Clamp Kit</p> <hr/> <p>1 x Machine vice</p>

	1 x Keyless drill chuck with arbor
	1 x 5L coolant fluid
Learning topics	Modes of CNC Operation
	Tool Data and Offsets
	CNC Program Execution
	CNC Program Structure
	Linear and Circular Interpolation
	Machine Setup and Operation
	Canned Cycles
	Spindle and Tool Codes
	CNC Turning Machines

Other requirements:

- Proof of extensive local service support (provide an organizational chart of the existing service staff, including certification from manufacturer)
- Certificate of authority to sell from the manufacturer or local distributor/reseller
- Certificate to conduct after-sales service and supply of spare parts from the manufacturer.

Sample Image:



Picture for reference only

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

Name of Company/Bidder	Signature over Printed Name of Authorized Representative	Date
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Technical Specifications

Lot 4

: Metal Fabrication Equipment

No.	Item	Minimum Agency Specifications Unless Otherwise Specified	Qty	Unit	Statement of Compliance*	Make Brand / Model	Reference
1	Electric Box Furnace	Kindly refer to the technical specifications attached as Revised Annex D4.	1	unit			
2	Hardness tester		1	unit			
3	Precision Centerless Grinding Machine		1	unit			
4	Pipe Beveling Machine		1	unit			
5	Plate Beveling Machine		1	unit			
6	Hydraulic Press Brake Machine		1	unit			
7	Hydraulic Shearing Machine		1	unit			
8	Lock Forming Machine		1	unit			
9	Hydraulic Plate Bending Roller Machine		1	unit			
10	Automatic Sheet and Plate Rolling Machine		1	unit			

No.	Item	Minimum Agency Specifications Unless Otherwise Specified	Qty	Unit	Statement of Compliance*	Make Brand / Model	Reference
11	Bench Mini Drill Press		1	unit			
12	Cut Off Machine		1	unit			
13	Metal Sheet Bending Machine		1	unit			
14	Hydraulic Press		1	unit			

* Bidders must state here either "Comply" or "Not Comply" against each of the individual parameters of each Specification stating the corresponding performance parameter of the equipment offered. Statements of "Comply" or "Not Comply" must be supported by evidence in a Bidders Bid and cross-referenced to that evidence. Evidence shall be in the form of manufacturer's un-amended sales literature, unconditional statements of specification and compliance issued by the manufacturer, samples, independent test data etc., as appropriate. A statement that is not supported by evidence or is subsequently found to be contradicted by the evidence presented will render the Bid under evaluation liable for rejection. A statement either in the Bidder's statement of compliance or the supporting evidence that is found to be false either during Bid evaluation, post-qualification or the execution of the Contract may be regarded as fraudulent and render the Bidder or supplier liable for prosecution subject to the applicable laws and issuances.

All tools, equipment, gadgets and electrically operated instruments should have Standard Manufacturers Manual and/or Datasheet/Specification Sheet/Brochure as indicated in Revised Annex D4.

Instruction Manual is an instructional book or booklet that is supplied with almost all technologically advanced products such as electrical products.

Datasheet/Specification Sheet/Brochure is a document that summarizes the performance and other characteristics of a product, machine, component that comes along with the product from its release from the manufacturer.

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

<hr/> Name of Company/Bidder	<hr/> Signature over Printed Name of Authorized Representative	<hr/> Date
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REVISED ANNEX D4

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
4	Metal Fabrication Equipment	04-001	Electric Box Furnace	Refer to Technical Specification of Item Code 04-001	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes
4	Metal Fabrication Equipment	04-002	Hardness tester	<p>Testable Hardness: Rockwell *Hardness Display: Digital *Preliminary test force: 29.42 N, 98.07 N *Test force: Rockwell Superficial 147.1 N, 294.2 N, 441.3 N *Test force: Rockwell 588.4 N, 980.7 N, 1,471 N *Resolution: 0.1 HR indication *Preliminary test force switching: Dial switching *Total test force switching: Weight change *Total test force load operation: Motor drive, button start *Test force duration: Fixed 3-5.5 s or manual operation *Maximum specimen dimension: 180 mm (100mm if cover is attached), 165 mm (from indenter axis to frame) *Functions: OK/NG judgment function, Offset correction function, Hardness conversion function *Data output interface: Digimatic RS-232C *Power source: 220VAC, 60Hz Single phase/ 3 phase * Includes standard accessories: - Flat anvil, V-anvil, AC Adapter, Vinyl cover, Accessory box, Level *Overall machine size: should not be bigger than 2m (width) x 3m (height) to ensure that there will be no issue during ingress</p> <p>Additional Requirements: - English Manual - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years)</p>	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes

REVISED ANNEX D4

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
4	Metal Fabrication Equipment	04-003	Precision Centerless Grinding Machine	<p>*Standard processing range: 1-80 diameter *Grinding wheel sizes: (ODxWxD): 400-455x200-205x200-250 *Adjusting wheel sizes: (ODxWxD): 200-255x200-205x200-100-115 *Regulating wheel speed: 13-308 rpm *Grinding wheel speed: 1000-1500rpm *Regulating wheel tilt range:-3 to +5 degrees *Regulating wheel swivel angle:±5 degrees *Coolant pump drive motor: 1/4 HP x 2P *Power source: 220VAC, 60Hz Includes standard accessories *Overall machine size: 2m (width) x 3m (height) to ensure that there will be no issue during ingress</p> <p>Additional Requirements: - English Manual - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years)</p>	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes

REVISED ANNEX D4

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
4	Metal Fabrication Equipment	04-004	Pipe Beveling Machine	<p>*Functions: External and Internal Beveling *Facing *Counter boring *Weld Removal *J-prepping and Compound bevels. *Materials: Any kind of steel & exotic alloy *Recommended working range: 3"-16" Diameter *Power: Pneumatic *Option of electric: 220VAC 50-60Hz *Overall machine size: 2m (width) x 3m (height) to ensure that there will be no issue during ingress</p> <p>Additional Requirements: - User's Manual (English) - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years)</p>	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<p>- Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing</p>	Yes
4	Metal Fabrication Equipment	04-005	Plate Beveling Machine	<p>*Self-propelled *Max. bevel width: 40mm *Bevel angle: 15-60 degree *Plate thickness: 6-60mm *Beveling speed: 0-1.6 m/min. *Motor power: 3000 w *Motor idle speed: 800 rpm *Voltage: 220V/60 Hz, 3-phase *Tooling: 9 changeable inserts; 80 mm diameter *Overall machine size: not more than 2m (width) x 3m (height) to ensure that there will be no issue during ingress</p> <p>Additional Requirements: - User's Manual (English) - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years)</p>	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<p>- Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing</p>	Yes

REVISED ANNEX D4

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
4	Metal Fabrication Equipment	05-001	Hydraulic Press Brake Machine	Refer to Technical Specification of Item Code 05-001	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes
4	Metal Fabrication Equipment	05-002	Hydraulic Shearing Machine	<ul style="list-style-type: none"> *Max. shearing Thickness: 6mm *Max. shearing length: 1000-2500mm *Cutting angle:1.2 degrees * No. of Clamps: 11 *Power source: 220VAC, 60 Hz *with following accessories: Blade for stainless steel *Technology Transfer/Training *English Manual *Overall machine size: 2m (width) x 3m (height) to ensure that there will be no issue during ingress <p>Additional Requirements:</p> <ul style="list-style-type: none"> - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years) 	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes

REVISED ANNEX D4

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
4	Metal Fabrication Equipment	05-003	Lock Forming Machine	<p>*Double seam rolls: capacity= 20 to 26 gauge, approx material used: 25 mm, size=9.5 mm seam *Drive cleat rolls: capacity= 20 to 26 gauge, approx material used: 54 mm, size=28 mm width *Right angle flange rolls: capacity= 26 to 25 gauge, approx material used: 9.5 mm, size=9.5 mm high *Motor: 1HP *Speed: 25 per minute *Drive: V-belt *Stand: Arc welded steel heavy top plate *All steel forming head, hardened ground shafts, case hardened steel forming rolls, machine cut gears and needle type roller bearing throughout *Power source: 220VAC, 60 Hz *Overall machine size: should not be bigger than 2m (width) x 3m (height) to ensure that there will be no issue during ingress</p> <p>Additional Requirements: - English Manual - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years)</p>	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes

REVISED ANNEX D4

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
4	Metal Fabrication Equipment	05-004	Hydraulic Plate Bending Roller Machine	<p>*Capacity: 2.5 x 1550 *Roll diameter: 110mm *Min. Roll Diameter: 165mm * Motor capacity 3HP *Power source: 220VAC, 60 Hz *with following features: Welded steel frames, three rolls mounted independently, all rolls are driven by a gear system *Overall machine size: should not be bigger than 2m (width) x 3m (height) to ensure that there will be no issue during ingress</p> <p>Additional requirements: User's Manual (English) Certificate of authority to sell from the manufacturer or local distributor/reseller Certificate of End of Life (EOL) Service from the Manufacturer and/or Supplier for 5 years</p>	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes
4	Metal Fabrication Equipment	05-005	Automatic Sheet and Plate Rolling Machine	<p>*3 roller bending roll machine *Rolling services at up to 10mm thick x 2000mm width *Roll Diameter 200mm *Foot switch control *Power source: Voltage 220VAC, 60Hz *Overall machine size: 4.5m or less x 1.5m or less x 2m or less</p> <p>Additional Requirements: - English Manual - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years)</p>	Equipment		<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes

REVISED ANNEX D4

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
4	Metal Fabrication Equipment	05-006	Bench Mini Drill Press	<p>Drilling cap: 25mm (1") Motor power: 3/4 -1 1/4 hp Spindle travel: 75-100 mm Swing: 360 mm Table size: 290mmx290mm Base size: 460x272mm Column diameter: 70-80mm Height: 140-160mm</p> <p>Additional Requirements: - English Manual - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years)</p>	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes
4	Metal Fabrication Equipment	05-007	Cut Off Machine	<p>Disc Diameter: 14" No load Speed: 3,800 RPM Power: 2000W Voltage: 220-240V, 60Hz</p>	Equipment		<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes
4	Metal Fabrication Equipment	05-008	Metal Sheet Bending Machine	<p>Box and pan brake Manual Bending angle: 0 - 135° Length: 48" Thickness: 16-20 gauge Beam lift max: 1.75" Box Depth: 4" With stand Includes 16 fingers with sizes 2" - 4" Power: 220V/60Hz/1Ph or 220V/60Hz/3Ph With english manual</p> <p>Additional Requirements: - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years)</p>	Equipment		<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes

REVISED ANNEX D4

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
4	Metal Fabrication Equipment	05-009	Hydraulic Press	H-Frame 15 ton capacity Piston travel: 160mm Bend angle: 0~135 degree Maximum capacity:16 gauge mild steel Dimension (from ground): 700 x 540 mm With Pressure Gauge Additional Requirements: - Certificate of authority to sell from the manufacturer or local distributor/reseller - Certificate of End of Life (EOL) Service from Manufacturer (5 years)	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	- Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing	Yes

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

Name of Company/Bidder

Signature over Printed Name of Authorized Representative

Date

TECHNICAL SPECIFICATION

Name of The Learning System	Smart Factory Enterprise
Item Code	08-001
Technology Area(s)	Smart Factory Simulator

General Description**MECHATRONICS LEARNING SYSTEM (4 sets)**

This learning system have two components: Curriculum and Hardware

A. The curriculum:**1. Content**

The topics to be covered:

- machine setup
- machine adjustment
- machine operation
- sequence programming
- interfacing to IO devices
- program design and documentation of a wide variety of mechatronic applications including:
 - Material Inventory Feed,
 - Gauging and Testing,
 - Orientation and Processing,
 - Buffering and Sorting,
 - Robotic Assembly,
 - Assembly Torquing, and
 - Programmable Storage.
- Adjustment and control of a wide variety of industrial automation components including:
 - pneumatic and electrical lockout/ tagout,
 - master control relay operation,
 - 8 types of electronic sensors,
 - ultrasonic gauging,
 - reversing motor starters,
 - stepper motors,
 - DC PWM motor control,
 - precision ball screw axis drives,
 - clutches,
 - pneumatic screw feed systems,
 - synchronous belt drives,
 - electric motor slides,
 - pneumatic rodless cylinders,

- rotary actuators,
- pneumatic brakes, and
- electrical overloads
- Wide variety of industry 4.0 application such as:
 - Product memory
 - RFID, QR, data matrix
 - Cyber-Physical Systems
 - Embedded controller
 - Web technology
 - IP and open standards communication
 - Systems planning
 - Energy monitoring, control and management
 - Error control
 - Maintenance planning
 - Predictive maintenance
 - Decentralized control technology
 - Data analytics
 - Remote control and monitoring via cloud/web services

2. Pedagogy

- The specific cognitive skills taught by each text passage shall be identified next to the passage. Each lab activity shall be identified by the industrial task taught. All activities shall be highly detailed with step-by-step instructions to facilitate a self-directed learning environment.
- A combination of step-by-step enabling activities and creative, problem-solving activities should be provided.
- A self-review of five to ten questions shall be provided after each segment.

3. Student Learning Package

The student curriculum supplied shall be designed in a skill-based format that focuses on teaching industry-relevant tasks. This curriculum shall be designed for use in a self-directed student-learning environment, which promotes a sense of rapid accomplishment and student motivation.

The student curriculum shall contain the following:

- Text materials, to cover for the knowledge/theories/principles
- Laboratory equipment activities
- Multimedia directions/guides

4. Teacher's Guide

The teacher's package shall contain student data sheets, data sheet solutions, self review answers, quizzes, quiz answers, student skill record sheets, and assessment directions. A quiz and graded performance activity should be provided to measure the learning outcomes.

5. e-Learning

An eLearning package should be provided to complement and to reinforce the learning experience. The digital contents should be placed in a SCORM compliant Learning Management Systems that allows unlimited users for two (2) training centers for one (1) year. The e-learning solution should allow the use of different teaching tools such as text, 3D animation, video, audio and virtual simulations. Topics to be covered are:

- **AUTOMATION**

1. Ethernet for Mechatronics
2. Mechatronics HMI
3. Mechatronics
4. Mechatronics Profibus
5. Mechatronics Troubleshooting
6. Mechatronics Troubleshooting with PLC
7. Mechatronics – PLC
8. Mechatronics - Ethernet/IP
9. Panelview Operator Interface
10. Mechatronics Simulation (Smart Factory)
11. Mechatronics Simulation
12. Pegasus Robotics Simulation
13. Robotics and Computer Programming
14. Robotics 1
15. Mechatronics CNC Mill
16. Machine Vision Inspection Systems
17. Machine Vision Inspection Systems
18. Mechatronics Troubleshooting System - PLC
19. Mechatronics RF Identification System
20. Mechatronics Barcode Identification
21. Mechatronics RF Identification System
22. Mechatronics RF Identification System- PLC
23. Tabletop Mechatronics
24. Mechatronics HMI
25. Mechatronics Barcode Identification – PLC
26. Mechatronics Barcode Identification – Barcode
27. Table-Top Mechatronics Servo Robot System
28. Table Top Smart Factory RFID/Sensors
29. Mechatronics Barcode Product Identification – PLC Controller
30. Tabletop Smart Factory Ethernet
31. Tabletop Smart Factory Manufacturing Execution System
32. Smart Factory Barcode System
33. Mechatronics RFID
34. Smart Factory Vision Inspection System
35. Smart Factory Visual Communication System
36. Mechatronics System
37. Mechatronics - Professional
38. Smart Factory Sensor System - Pneumatics/Vacuum
39. Smart Factory Sensor System - Ultrasonic
40. Smart Factory Sensor System - Photoeye
41. Smart Factory Device Learning System - Stack Light
42. Smart Factory Sensor System - Electrical Current

43. Smart Factory Sensor System - Analog Position
44. Smart Factory Sensor System - Analog Pressure
45. Tabletop Smart Factory Visual Communications
46. Smart Factory Barcode System – Basic
47. Mechatronics RFID AB L16
48. Smart Factory Ethernet
49. Smart Factory Network Security Learning System
50. Smart Factory Manufacturing Execution System
51. Smart Factory Visual Communications
52. Smart Factory Sensor System – Pneumatics/ Vacuum Advanced
53. Smart Factory Sensor System – Ultrasonic Advanced
54. Smart Factory Sensor System – Photoeye Advanced
55. Smart Factory Device Learning System Stack Light
56. Smart Factory Sensor System – Electrical Current
57. Smart Factory Sensor System – Analog Position
58. Smart Factory Sensor System – Analog Pressure
59. Mechatronics
60. Computer Control 2
61. Principles of Robotics
62. Principles of Factory Automation
63. Principles of Robotics

- **ELECTRONICS**

1. DC Electronic Drives
2. Portable Plc
3. Portable Plc Troubleshooting
4. PLC Analog Application
5. PLC ControlNet
6. Mastering Programmable Controllers
7. PLC Statement List
8. PLC Analog
9. PLC Profibus
10. MPC
11. PLC Graph Programming -
12. MPC - i Bus
13. MPC
14. Mastering Programmable Controllers
15. PLC Troubleshooting
16. Programmable Controller
17. Mastering Programmable Controllers
18. Power and Control Electronics
19. AC Motor Drives
20. AC Motor Drive Troubleshooting
21. Electrical Control Systems
22. Variable Frequency AC Drive
23. AC Electronic Drives
24. PLC Motor Control
25. PLC Motor Control
26. Portable PLC Learning System
27. Portable PLC with Troubleshooting

28. PLC Troubleshooting- PLC
29. PLC Troubleshooting
30. Computer Control 1

- **ELECTRICAL**

1. Electric Motor Control
2. AC/DC Electrical Systems
3. Electrical Control 1
4. Portable Electric Relay Control Troubleshooting
5. Electric Relay Control
6. AC/DC Electrical Systems
7. Electric Motor Control
8. Electric Motor Control Troubleshooting
9. Electrical Fabrication 1
10. Motor Braking
11. Reduced Voltage Starting
12. Electronic Sensors
13. Electronic Counter
14. SCR Speed Control
15. Electric Wiring System
16. PLC/VFD Wiring System
17. Industrial Soldering
18. Ethernet and Analog Wiring
19. Electrical Power Distribution
20. Electric Motor Control
21. Motor Troubleshooting System
22. Rotating Electric Machines
23. DC Generators
24. Wound Rotor Motor
25. Rotating Electrical Machines

- **GREEN ENERGY**

1. Wind Concepts
2. Turbine Electric Hub Troubleshooting
3. Turbine Generator Control Troubleshooting
4. Turbine Nacelle Troubleshooting
5. Solar Concepts
6. Solar Site Analysis
7. Alternative Energy
8. Solar Thermal Troubleshooting - Open-Loop
9. Solar Thermal Troubleshooting - Closed-Loop
10. Solar Thermal Installation
11. Solar PV Troubleshooting
12. Solar Grid-Tie
13. Data Acquisition
14. Solar Photovoltaic Installation

- **LEAN MANUFACTURING**
 1. Lean Overview and Workplace Organization
 2. Introduction to Lean
 3. 5S
 4. Total Productive Maintenance
 5. Poka-Yoke
 6. Lean Theory
 7. Lean Process Flow
 8. Visual Workplace
 9. Standardized Work
 10. Kaizen
 11. Value Stream Mapping
 12. Set-Up Reduction
 13. Six Sigma

- **MACHINING**
 1. Machine Tools 1
 2. Machine Tools 2
 3. Machine Tools 3
 4. Manual Machine Tools
 5. CNC Machine Tools 1
 6. CNC Machine Tools 2
 7. CNC Machine Tools 3
 8. Principles of CNC
 9. CNC Control
 10. Principles of Turning
 11. Principles of Machining Centers
 12. Principles of Grinding
 13. Principles of Workholding
 14. Principles of Coolants and Oils
 15. Principles of Gear Manufacturing
 16. Principles of Tooling
 17. Tooling for Turning
 18. Tooling for Machining Centers
 19. Tooling for Grinding
 20. Tooling for Tapping

- **MANUFACTURING PROCESS**
 1. Product Finishing
 2. Production Assembly
 3. Split Flange Coupling Assembly
 4. Electric Torque Wrench Assembly
 5. Print Reading 1
 6. Welding Technology 1
 7. Computer-Aided Design 1
 8. Computer Aided Design 2
 9. Wiring Harness Assembly
 10. Contamination
 11. Fasteners
 12. Gaskets

13. Stall Bar Assembly
14. Instrumented DC-Electric Torque Wrench Assembly
15. Computer-Aided Manufacturing 1
16. Blueprint Reading
17. AWS Welding Symbols on Blueprints
18. General Dimensioning and Tolerances
19. Geometric Dimensioning and Tolerancing

- **MATERIALS**

1. Plastic Mold Design
2. Manufacturing Processes 3
3. Structural Engineering 1
4. Structural Engineering 2
5. Surveying
6. Materials Engineering 1
7. Principles of Materials - Ferrous Metals
8. Principles of Materials - Non-Ferrous Metals
9. Principles of Heat Treating
10. Principles of Plastics
11. Principles of Composites
12. Principles of Ceramics

- **MECHANICAL**

1. Vibration Analysis
2. Pump Systems
3. Multiple Pump
4. Turbine Pump
5. Diaphragm Pump
6. Peristaltic Tubing Pump
7. Piston Pump
8. Gear Pump
9. Magnetic Pump
10. Centrifugal Pump
11. Rigging 3
12. Mechanical Drives 4
13. Floor Standing Belt Conveyor
14. Predictive Maintenance Vibration Analysis
15. Roller Pack Machine Tool Axis
16. Plain Bearing Machine Tool Axis
17. Mechatronics Simulation
18. Piping
19. Central Lubrication
20. Mechanical Systems 1
21. Mechanical Fabrication 2
22. Rigging Systems 1
23. Rigging Systems 2
24. Mechanical Fabrication 1
25. Mechanical Drives 1
26. Portable Mechanical Drives 2
27. Mechanical Drives 2

28. Mechanical Drives 3
29. Laser Shaft Alignment
30. Portable Laser Shaft Alignment
31. Mechanical Systems 2

- **PROCESS CONTROL**

1. Temperature Process Control
2. Data Acquisition
3. Analytical Process Control
4. Data Acquisition Systems
5. Process Control
6. Process Control Systems: Ultrasonic Level Measurement and Control
7. Process Control Systems: Differential Pressure Flow Measurement and Control
8. Process Visualization Control 1
9. Pressure Process Control Systems
10. Foundation Fieldbus Process Control 1
11. HART Process Control 1
12. Mastering Programmable Controllers
13. PLC Process Control
14. PLC Process Control 2
15. Process Control Systems

- **QUALITY ASSURANCE**

1. Metrology 1
2. Measurement Tools 1
3. Quality Assurance 1
4. Portable Precision Gauging 1
5. Portable Measurement Tools
6. Inspection Techniques 1
7. Surface Plates
8. Gauge Blocks
9. Test Indicators
10. Height Gauges
11. Bench Comparators
12. Optical Comparators
13. Bore Gauges
14. Air Gauges
15. Specialty Micrometers
16. Miscellaneous Inspection Instruments
17. ISO 9000 and TS 16949
18. Statistical Process Control 1
19. Statistical Process Control 2
20. Quality Control Concepts

- **SAFETY**

1. Safety Practices and Regulations
2. Personal Protective Equipment
3. Hazardous Communication

4. Confined Spaces
5. Lockout/Tagout
6. Accident Response
7. Overhead Crane Safety

- **THERMAL**

1. Air Conditioning / Heat Pump
2. Steam Systems
3. Thermal Systems 1
4. Environmental Applications
5. Geothermal
6. Geothermal Troubleshooting
7. Geothermal Desuperheater
8. Geothermal Troubleshooting with Desuperheater
9. Geothermal Flush Cart Learning System
10. Thermal Technology 1
11. Thermal Technology 2

- **WORKPLACE EFFECTIVENESS**

1. Enterprise Systems 1
2. Principles of Advanced Manufacturing
3. Mathematics 1
4. Trigonometry 1
5. Communication Skills
6. Conflict Resolution
7. Working in Groups

B. The hardware:

1. General Parameters:

- Generally, the system should be 220 VAC single phase 60Hz with 24VDC system voltage. Other components may have other voltage requirements provided that the voltage conversion kit will be included in the package.
- Air compressors should be included in the package including hoses/connectors, filters and control valves.
- Protection systems such as overload protection, short circuit protection and over current protection should be included in the package.
- All stations should have their own Programmable Logic Controllers to simulate distributed processes and controls. Each PLC should be able to communicate via ethernet and other industry standard protocols.
- Remote monitoring and control via web service/cloud should be supported by the system
- Programming software should be included in the package, including software needed to develop the visualization and human machine interface (at least 4 users)
- Computer set to control and monitor the process should be included in the package. At least a 34 inch monitor is required.

2. Stations/modules

- Pick and Place Feeding Station (1 set)
This station simulates the pick and place operation in an industrial manufacturing/processing facility that transfers the workpiece from the pickup area to the drop off location.

- Gauging Station (1 set)
The gauging station simulates the ultrasonic measurement and proximity measurement/inspection process.

- Orientation-Processing Station (1 set)
This station simulates eight (8) workpiece indexing positions with the following machine operations:
 - home
 - limit plus
 - limit minus
 - go
 - stop
 - pause
 - jog plus
 - jog minus
 - analog in
 - moving
 - fault
 - stall
 - velocity change
 - trip on input
 - trip on position
 - basic math functions
 - logical math expressions
 - branch and call subroutines

- Servo Robot Assembly Station (1 set)
This station will simulate the workpiece assembly process. The sequence shall be in accordance with the workpiece design.

- Smart Robot Workcell (1 set)
This station simulates the application of a robot arm in a manufacturing process. The robot arm should include an area laser scanner and gripper fixtures suitable for multiple applications.

- HMI Terminal Learning System
This module will facilitate learning how to develop human machine interface and its application in control and monitoring of manufacturing operations.

Note:

- *The applications of 4IR should be incorporated into the operation of the different stations indicated above.*
- *Each station should have a distributed control units connected in networks for centralize control and monitoring*

3. Hand Tool package (1 set)

Include the following:

- 3-Drawer Tool Box
- Digital Multimeter
- Dial Caliper – 6-in.
- Hex Wrench Set – 13 pieces
- Metric Allen Wrench Set – 11 pieces
- Ultrasonic Meter Wrench
- Adjustable Wrench – 8-in. (2)
- Ignition Wrench Set – 20 pieces
- Metric Ignition Wrench Set
- Screwdriver Set – Straight and Phillips
- Flat Blade Screwdriver
- Combination Square – 6-in.
- Tap Handle and Tap
- Die Handle and Die

Sample Image:



Picture for reference only

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

<hr/> Name of Company/Bidder	<hr/> Signature over Printed Name of Authorized Representative	<hr/> Date
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TECHNICAL SPECIFICATION

Name of The Learning System	Motor Control Trainer
Item Code	09-003
Technology Area(s)	Motor Control Simulator

Brief Description

This learning system will develop the learner's ability to apply control technology using various types of magnetic contactors, electromechanical and electronic switches both in AC and DC circuits.

Required Topics/Lessons

Specifically, this learning system will cover the following topics:

- Lockout/Tagout procedure
- Cont panel devices and instruments
- Principles of contactors and control relays
- Specifications reading
- Symbols, Designations and Diagrams
- Frequency Converter Panel Control Motor Start and Stop
- External Terminal Control Experiment Based on Frequency Converter
- Reverse Switch Control Motor Forward and Reverse Experiment
- Use Star - Delta starter to Star Motor
- Combination Switch Control Two-speed Motor Experiment
- Contactor Controlled Motor Self-locking Experiment
- Contactor Interlocking Motor Forward & Reversing Control Circuit
- Dual-interlock Three Phase Asynchronous Motor Forward/Reversing Control Circuit
- Y- Δ Start Experiment Controlled by Contactor
- Y- Δ Start Experiment Controlled by Time Relay
- Three-phase Asynchronous Motor Sequence Control
- Single-phase Capacitor Motor Start Experiment
- Single Phase Capacitor Motor Forward and Reverse Experiment
- Single-phase Resistance Motor Forward and Reverse Rotation Experiment
- Switched Reluctance Motor Speed Control Experiment
- How to Use Torque Sensor

Technical Description

The requirements for this learning system are as follows:

- Modules:
 - Power supply
 - 3 phase 380V 60hz
 - 220 VDC 60Hz
 - Variable AC 0~220V 3 Phase

- Variable DC 0~200V
 - Fixed 24 VDC
- Frequency converter
 - 3 phase
 - 0.55 kW
 - 1.7 A
 - 0~550Hz frequency out
 - Voltage depends on engineering design of the system
- Variable resistant module
 - 0-90Ω adjustable resistance
 - 150W
 - 4 groups
- Motor drag modules
 - Composed of circuit breaker, magnetic contactors, switches, relays, protection and other devices
 - Quantity and specification should be sufficient to run the exercises covered in each topics
- Motors
 - DC servo motor with controller
 - Shaded pole motor (motor + governor)
 - Repulsion motor with controller (single phase gear motor)
 - Single-phase capacitor motor 220VAC 60hz 120 watts, 1400 rpm
 - Two speed motor AC 380 VAC 60hz, 300/450 watts, 1400/2800 pm
 - Single-phase resistance motor, AC 220V 60Hz, 1400rpm
 - Three-phase induction motor AC380V, 60hz, 1 torque sensor, 1 magnetic powder brake and 3 sets of aviation plugs. (The motor can be replaced with any other motor)
 - Three-phase winding motor AC380V 60Hz 1400r/min
- Measuring instruments (panel type or hand held instruments/multimeters)
 - 3 AC digital voltmeter
 - 3 digital ammeter
 - 1 three phase digital power meter
 - 1 single-phase power meter
 - 1 digital power factor meter
 - 1 digital frequency meter
 - phase-sequence indicator
 - digital tachometer

- Other devices
 - torque sensor display meter,
 - tension controller
- Multi-level frame to hold the modules, table top to hold additional instruments and storage cabinet to hold modules not in use.
- Three Phase 220VAC, 60Hz
- 150 pieces per color of connecting wires
- Dimension: The equipment when installed should not consume more than 6 sqm space and not over 2m for the overall height.
- This includes curriculum and instruction to exercises in print and digital format

Additional requirement:

- Certificate of End of Life (EOL) Service from Manufacturer (5 years)

Sample Image:



Picture for reference only

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

Name of Company/Bidder	Signature over Printed Name of Authorized Representative	Date
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Technical Specifications

Lot 13 : 3D Printing Technology

No.	Item	Minimum Agency Specifications Unless Otherwise Specified	Qty	Unit	Statement of Compliance*	Make Brand / Model	Reference
1	Metal 3D Printer Machine	Kindly refer to the technical specifications attached as Annex D13.	2	set			
2	Resin 3D Printer - LCD Type		12	set			
3	Fused Deposition Modeling 3D Printer		21	Set			
4	3D Scanner		8	set			

* Bidders must state here either “Comply” or “Not Comply” against each of the individual parameters of each Specification stating the corresponding performance parameter of the equipment offered. Statements of “Comply” or “Not Comply” must be supported by evidence in a Bidders Bid and cross-referenced to that evidence. Evidence shall be in the form of manufacturer’s un-amended sales literature, unconditional statements of specification and compliance issued by the manufacturer, samples, independent test data etc., as appropriate. A statement that is not supported by evidence or is subsequently found to be contradicted by the evidence presented will render the Bid under evaluation liable for rejection. A statement either in the Bidder’s statement of compliance or the supporting evidence that is found to be false either during Bid evaluation, post-qualification or the execution of the Contract may be regarded as fraudulent and render the Bidder or supplier liable for prosecution subject to the applicable laws and issuances.

All tools, equipment, gadgets and electrically operated instruments should have Standard Manufacturers Manual and/or Datasheet/Specification Sheet/Brochure as indicated in Annex D13.

Instruction Manual is an instructional book or booklet that is supplied with almost all technologically advanced products such as electrical products.

Datasheet/Specification Sheet/Brochure is a document that summarizes the performance and other characteristics of a product, machine, component that comes along with the product from its release from the manufacturer.

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

Name of Company/Bidder	Signature over Printed Name of Authorized Representative	Date
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REVISED ANNEX D13

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
13	3D Printing Technology	13-001	Metal 3D Printer Machine	Refer to Technical Specification of Item Code 13-001	Equipment		<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes
13	3D Printing Technology	13-002	Resin 3D Printer - LCD Type	<p>Connectivity: USB / Ethernet Technology: Resin 3D Printer - LCD Type Operation: At least 3.0 inch touch screen Projection screen: at least 9 inch industrial 6k monochrome screen Wavelength: 405 nm XY Resolution: 35 µm Layer Thickness: maximum range up to 0.2mm Minimum Print Speed: 50mm/H Power Requirement: 220-240 V, 60Hz Printer size: at least L11 x W9 X H17 inches or equivalent Print Volume: at least L7.0 x 4.0 x 7.0 inch</p> <p>Inclusion: accessories for the complete operation of resin printer 1 unit of wash per printer 1 unit of cure per printer 1 bottle of Regular Resin User's manual in English</p> <p>Other requirements: Includes installation, commissioning and training Certificate of authority to sell from the manufacturer or local distributor/reseller Certificate of End of Life (EOL) Service from the Manufacturer and/or Supplier for 5 years Proof of certified trainer issued by the manufacturer</p>	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing 	Yes

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
13	3D Printing Technology	13-003	Fused Deposition Modeling 3D Printer	Refer to Technical Specification of Item Code 13-003	Equipment	Evaluation of Brochure with picture and/or data sheet and training proposal	- Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing	Yes
13	3D Printing Technology	13-004	3D Scanner	Refer to Technical Specification of Item Code 13-004	Equipment		- Checking the conformity with the quantity including parts and accessories - Checking the conformity of hardware vis-a-vis offered specifications - Functionality testing	Yes

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

Name of Company/Bidder

Signature over Printed Name of Authorized Representative

Date

TECHNICAL SPECIFICATION

Name of The Learning System	Metal 3D Printer with Sintering Furnace
Item Code	13-001
Technology Area(s)	3D Printing Technology

Technical Specification

- Print technology: Metal Fused Filament Fabrication (MFFF) with capability to print metal materials and ceramic release
- Build volume: at least 300 x 210 x 180 mm
- Material Compatibility: Compatible with stainless steel, Tool Steel, High Purity Copper (99.8%), Inconel, Ceramic release
- Print Head: Dual Extrusion Print head Two nozzles — Metal material and release material
- Nozzle diameter: 0.4mm
- Print Head Technology: Dual extruder
- Layer resolution: Compatible up to 50 micron or better
- Certification: ISO/IEC 27001
- Enclosure: Fully enclosed system with heated print chamber
- Heated bed: must be able to reach at least 100 degree celsius or higher
- Printer should be able to connect to a printer management system that can track the users, print times, print consumption and other statistics
- Bed leveling should be an automatic leveling system
- Connectivity: Wifi, Ethernet, LAN, USB Drive Connectivity
- Power Requirements: 110-240VAC, 60Hz, Single-phase
- File type: STL
- Includes separate unit of Laboratory Sintering Furnace capable of reaching at least 1300C and is carbon free retort
 - Size Capacity: 140mm ID x 300mm L and can accommodate batch processing
- All metal materials from printing system are able to be sintered in furnace
- Gas Type: Argon and Mixes gas, locally available - Open source non-proprietary
- Includes separate unit of debinding station using Oxalic Acid Fluid or equivalent with work envelop of At least 300 x 200 x 200 mm
- Safety Management must include High vapor shut off and Low fluid level shut off
- Wash fluid must be locally available - Open source non-proprietary
- Includes slicing software (perpetual license) with template of material parameters readily available for debinding and sintering process
- Software Security: Two-factor authentication, org admin access, single sign-on
- Metal 3D printer, debinding station and sintering furnace should be the same brand and can be operated using one software for compatibility
- Different layer settings do not require any nozzle change
- Different metal materials do not require any nozzle change
- Offer must include training certification from the manufacturer for the end-user to become Certified Additive Expert in Metal 3D Printing. Attached certification curriculum.

Additional requirements:

- Certificate of authority to sell from the manufacturer or local distributor/reseller
- Certificate of End of Life (EOL) Service from the Manufacturer and/or Supplier for 5 years
- Proof of certified trainer issued by the manufacturer

Package inclusion:

- 1 unit debinder
- 1 unit sintering furnace
- 1 spool each metal material - stainless steel and tool steel
- 1 set of external exhaust and gas handling for furnace
- 1 set of gas and fluid

Sample Image:



Picture for reference only

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

_____ Name of Company/Bidder	_____ Signature over Printed Name of Authorized Representative	_____ Date
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REVISED**TECHNICAL SPECIFICATION**

Name of The Learning System	Fused Deposition Modeling 3D Printer
Item Code	13-003
Technology Area(s)	3D Printing Technology

Technical Specification

Filament	PLA/ABS/PETG
Nozzle temperature	At least 260 degree celsius
Printing size	At least 200 x 200 x 250 mm or larger
Maximum printing speed	150mm/s
Leveling	Auto-levelling
Extruder	Single; Nozzle size: 0.4mm
Motherboard	32 bit silent motherboard or equivalent
Data transmission	SD card and USB/Type C USB
Language	English
Others	Touchscreen
Accessories	<ul style="list-style-type: none">● Extruder cleaning kit● 4 spool PLA● 2 spool ABS● 2 spool PETG
Other Requirements	<ul style="list-style-type: none">● Certificate of authority to sell from the manufacturer or local distributor/reseller● Certificate of End of Life (EOL) Service from the Manufacturer and/or Supplier for 5 years

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

**Name of
Company/Bidder**

**Signature over Printed Name of
Authorized Representative**

Date

REVISED

TECHNICAL SPECIFICATION

Name of The Learning System	3D Scanner
Item Code	13-004
Technology Area(s)	3D Printing Technology

Technical Specification

- Handheld 3D Scanner for medium to large object with built-in touchscreen interface
- 3D point accuracy up to 0.1mm
- 3D resolution up to 0.6mm or better
- Field of View: 280 x 360mm to 490 x 650mm
- Data processing algorithms: Geometry and textured based
- Ability to capture texture, light source: white LED
- Texture resolution: 2.3mp
- 3D Reconstruction rate: 16fps or equivalent
- Data acquisition speed : at least 3Mln points /sec or higher
- Built-in onboard screen, touchscreen interface
- System requirements: Intel core i7 or i9, 64+GB RAM NVIDIA GPU with 8+GB VRAM Complete accessories
- 3D Formats: OBJ, PLY, STL, etc
- User's Manual (English)
- Certificate of authority to sell from the manufacturer or local distributor/reseller
- Certificate of End of Life (EOL) Service from the Manufacturer and/or Supplier for 5 years
- Training certificate provided by manufacturer to certified trainer (see section 6 of the bidding document for details)

Package inclusions:

- 1 Unit Battery
- 1 Unit Hard Case
- 1 Set USB Kit
- 1 Set Licensed 3D Scanning Software

Sample Image:



Picture for reference only

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**Name of
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REVISED**TECHNICAL SPECIFICATION**

Name of The Learning System	Development Controller Board Kit
Item Code	14-001
Technology Area(s)	Electronics Prototyping Set

Arduino Prototyping kit for various applications

Arduino Uno r3 Dip Type ATMEGA16U2 USB (stand-alone board)

- 14 Digital I/O
- 6 Analog I/O
- 5V
- USB Cable (0.5m Length)

Arduino Uno R3 Kit with the following parts

1. 1 x Mainboard + 1 x USB cable (0.5m Length)
2. 1 x GPIO Extension Board + 1 x Connecting Cable
3. 1 x Breadboard (830 Points)
4. 1 x Mini Breadboard + 1 x Extension board
5. 10 x 3mm Red LEDs
6. 10 x 3mm Green LEDs
7. 10 x 3mm Yellow LEDs
8. 1 x 5mm RGB LED
9. 5 x Button with Cap
10. 10 x 330 ohm Resistor
11. 10 x 1k ohm Resistor
12. 10 x 10k ohm Resistor
13. 1 x 1K Adjustable Trim Pot Resistor (Potentiometer)
14. 1 x 10K Adjustable Trim Pot Resistor (Potentiometer)
15. 1 x 2.54mm Elbow 40 Pin Header
16. 1 x 2.54mm Straight 40 Pin Header
17. 1 x 5516 LDR (Photoresistor)
18. 1 x Ball switch
19. 1 x Active Buzzer 5V
20. 1 x Passive Buzzer 5V
21. 1 x 74HC595 8bit Shift Register
22. 1 x LM35 Temperature Sensor
23. 1 x SS8050 NPN Transistor
24. 1 x 1838 Infrared Receiver
25. 1 x Infrared Sender
26. 1 x Infrared Phototransistor (Flame Sensor)
27. 1 x Infrared Remote controller (Battery Not Included)
28. 1 x Stepper Motor
29. 1 x SG90 Servo motor

- 30. 1 x 1602 LCD
- 31. 1 x 1-Digit Eight-segment Display
- 32. 1 x 4-Digit Eight-segment Display
- 33. 1 x 8*8 Dot Matrix Led Display
- 34. 1 x Stepper Motor Driver Board
- 35. 1 x Sound Sensor Module
- 36. 1 x PS2 Joystick module
- 37. 1 x RTC module(Battery Not Included)
- 38. 1 x Relay Module(5V-10A)
- 39. 65 x Jump Wires
- 40. 10 x Female-Female Dupont wires
- 41. 10 x Male-Female Dupont wires
- 42. 1 x 9V Battery Holder(Battery not included)
- 43. 1 x HC-SR04 Module

38 in 1 box Sensor Kit for Arduino with the following parts:

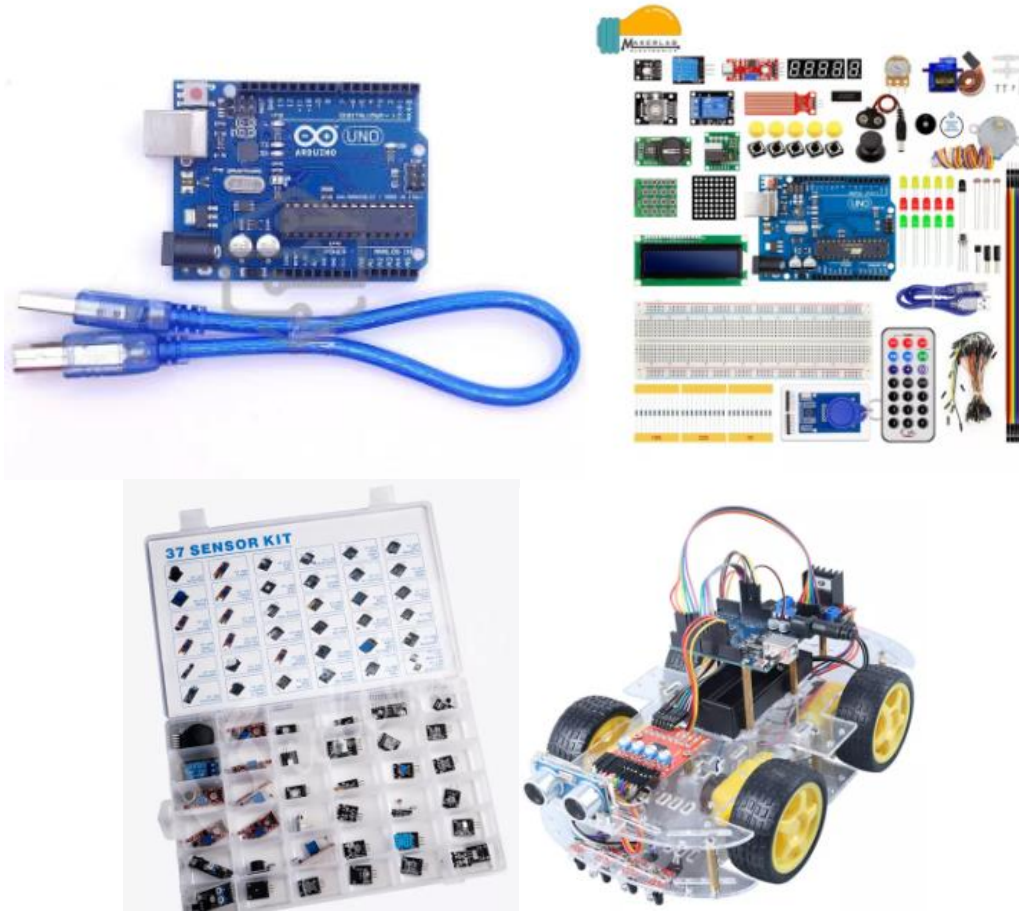
- 1. 1 x Joystick module
- 2. 1 x Flame Sensor module
- 3. 1 x RGB LED module
- 4. 1 x Heartbeat Sensor module
- 5. 2 x Light Cup module
- 6. 1 x Hall Magnetic module
- 7. 1 x Relay module
- 8. 1 x Linear Hall module
- 9. 1 x SMD RGB module
- 10. 1 x 7 Color Flash module
- 11. 1 x Hydrargyrum Switch module
- 12. 1 x 18B20 Temperature module
- 13. 1 x Big Sound module
- 14. 1 x Metal Touch module
- 15. 1 x Two-Color module
- 16. 1 x Tilt Switch module
- 17. 1 x Analog Temperature module
- 18. 1 x Small Sound module
- 19. 1 x Digital Temperature module
- 20. 1 x Mini Two-Color module
- 21. 1 x Button module
- 22. 1 x Photo Resistor module
- 23. 1 x IR Emission module
- 24. 1 x Tracking sensor module
- 25. 1 x Microphone sensor module
- 26. 1 x Active Buzzer module
- 27. 1 x Magnetic Spring module
- 28. 1 x Shock sensor module
- 29. 1 x Temperature and Humidity sensor module
- 30. 1 x IR Receiver sensor module

- 31. 1 x Avoidance Sensor module
- 32. 1 x Passive Buzzer module
- 33. 1 x Mini Reed Switch sensor module
- 34. 1 x Rotary Encoders sensor module
- 35. 1 x Analog Hall Sensor module
- 36. 1 x Tap sensor module
- 37. 1 x Light Blocking sensor module

4WD SMART Robot Car Chassis Kit for Arduino with the following parts:

- 1. 2 x Acrylic transparent 4-wheel trolley floor
- 2. 1 x CH340 with USB development board(with a data cable)
- 3. 1 x L298N motor drive module
- 4. 1 x Ultrasonic sensor module
- 5. 1 x Four-way tracking module
- 6. 4 x 5V DC gear motor (with wheels)
- 7. 1 x Ultrasonic bracket
- 8. 8 x Motor fixing bracket (acrylic transparent)
- 9. 4 x Speed Code Disc (Black)
- 10. 1 x 18650 battery box with switch
- 11. 3 x M3*50 copper pillar
- 12. 8 x M3*30 copper pillar
- 13. 2 x M3*15+6 copper pillar
- 14. 17 x M3 nuts
- 15. 33 x M3*8 round head screw
- 16. 8 x M3*30 round head screws
- 17. 3 x M2 nut
- 18. 2 x M2*8 round head screws
- 19. 4 x M1.6*8 round head screws
- 20. 4 x M1.6 nut
- 21. 1 x Male to female Dupont wire 30cm
- 22. 15 x Male to female Dupont line 20CM
- 23. 8 x Male to male Dupont line 20cm
- 24. 4 x Male to female Dupont wire 10cm
- 25. 2 x Male to male Dupont line 10cm
- 26. 1 x Four-way tracing and obstacle avoidance car kit CD
- 27. 1 x Yellow packing box(270*165*50mm)

Sample Image:



Picture for reference only

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

**Name of
Company/Bidder**

**Signature over Printed Name of
Authorized Representative**

Date

REVISED**TECHNICAL SPECIFICATION**

Name of The Learning System	Micro-computer Development Kit
Item Code	14-002
Technology Area(s)	Electronics Prototyping Set

Board Specification

SOC	Broadcom BCM2771
CPU	64-Bit 1.5 Hz Quad-core
GPU	Broadcom VideoCore VI@500MHz
Bluetooth	5.0
USB Interface	USB 3.0 x 2
HDMI	Micro HDMI supports 4K60
Power Supply Interface	USB Type-C (5V 3A)
WiFi	802.11 2.4GHz/5Ghz Dual band
Wired Network Interface	True Gigabit Ethernet
Ethernet POE	Powered Over additional HAT Ethernet (POE)

Includes

- Case
- USB-C Power supply
- Micro HDMI to Standard HDMI Cable (1m)
- Heatsink and fan
- 32 GB Class 10 MicroSD Card

LCD module

- 5.0" 800*480 DSI IPS
- Multi-touch
- With case

Toolbox/Organizer

- 40~44 cm x 20~23 cm x 19~21 cm (L x W x H)
- Polypropylene/ABS plastic with metal latch

- 3 component storage on the top cover
- 1 Removable tray
- Max load: 15KG

Sample Image:



Picture for reference only

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<hr/> <p>Name of Company/Bidder</p>	<hr/> <p>Signature over Printed Name of Authorized Representative</p>	<hr/> <p>Date</p>
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REVISED**TECHNICAL SPECIFICATION**

Name of The Learning System	Toolkit
Item Code	14-009
Technology Area(s)	Electronics Prototyping Set

Screw driver set

- Soft grip handle
- Chrome Vanadium
- Magnetic
- Includes plastic screw driver holder (table top)
- Sizes are as follows:
 - Flat
 - 1pc x 6.5 x 38mm
 - 1pc x 6.5 x 100mm
 - 1pc x 5.5 x 75mm
 - 1 pc x 8 x 150mm
 - Philips
 - 1 pc x 2 x 38mm
 - 1 pc x 2 x 100 mm
 - 1 pc x 1 x 75 mm
 - 1 pc x 3 x 150 mm
 - Precision Screwdrivers
 - 1 pc x Flat 1.5 x 50mm
 - 1 pc x Flat 2 x 50 mm
 - 1 pc x Flat 2.5 X 50mm
 - 1 pc x Flat 3 x 50 mm
 - 1 pc x Philips 000x50mm
 - 1 pc x Philips 00 x 50 mm
 - 1 pc x Philips 0 x 50mm
 - 1 pc x T6 x 50mm
 - 1 pc x T8 x 50mm
 - 1 pc x T10 x 50mm

Plier set

- Long nose plier
 - 6 inch long
 - Chrome Vanadium
 - Non-slip /Soft grip handle
- Flat nose/Electricians plier
 - 9 inch long
 - Chrome Vanadium
 - Non-slip /Soft grip handle

- Diagonal cutting plier
 - 6 inch long
 - Chrome Vanadium
 - Non-slip /Soft grip handle

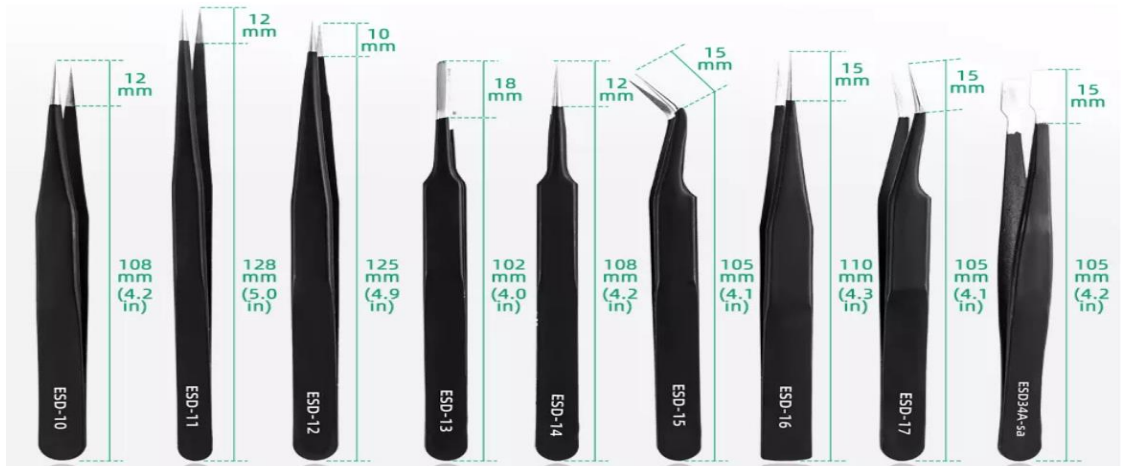
Precision Diagonal Cutter

- stainless steel
- 130mm long
- 8mm jaw opening
- with automatic reset spring
- non slip handle

Tweezer

- Stainless Steel
- Anti-static
- Includes: carrying case/pack
- Tip:
 - Straight tip:
 - ESD-10
 - ESD-11
 - ESD-12
 - ESD-14
 - ESD-16
 - Flat round head:
 - ESD-13
 - Curved Tip
 - ESD-15 45°
 - ESD-17 30°
 - Flat head
 - ESD34A-sa

Sample Image:



Picture for reference only

Toolbox/Organizer

- 40~44 cm x 20~23 cm x 19~21 cm (L x W x H)
- Polypropylene/ABS plastic with metal latch
- 3 component storage on the top cover
- 1 Removable tray
- Max load: 15KG

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

Name of Company/Bidder	Signature over Printed Name of Authorized Representative	Date
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Technical Specifications

Lot 19 : Software Productivity

No.	Item	Minimum Agency Specifications Unless Otherwise Specified	Qty	Unit	Statement of Compliance*	Make Brand / Model	Reference
1	Adobe Creative Cloud All Apps	Kindly refer to the technical specifications attached as Revised Annex D19.	182	license			
2	Microsoft Office 365		159	license			

* Bidders must state here either “Comply” or “Not Comply” against each of the individual parameters of each Specification stating the corresponding performance parameter of the equipment offered. Statements of “Comply” or “Not Comply” must be supported by evidence in a Bidders Bid and cross-referenced to that evidence. Evidence shall be in the form of manufacturer’s un-amended sales literature, unconditional statements of specification and compliance issued by the manufacturer, samples, independent test data etc., as appropriate. A statement that is not supported by evidence or is subsequently found to be contradicted by the evidence presented will render the Bid under evaluation liable for rejection. A statement either in the Bidder’s statement of compliance or the supporting evidence that is found to be false either during Bid evaluation, post-qualification or the execution of the Contract may be regarded as fraudulent and render the Bidder or supplier liable for prosecution subject to the applicable laws and issuances.

All tools, equipment, gadgets and electrically operated instruments should have Standard Manufacturers Manual and/or Datasheet/Specification Sheet/Brochure as indicated in Revised Annex D19.

Instruction Manual is an instructional book or booklet that is supplied with almost all technologically advanced products such as electrical products.

Datasheet/Specification Sheet/Brochure is a document that summarizes the performance and other characteristics of a product, machine, component that comes along with the product from its release from the manufacturer.

I hereby certify that the statement of compliance to the foregoing technical specifications are true and correct, otherwise, if found to be false either during bid evaluation or post-qualification, the same shall give rise to automatic disqualification of our bid.

Name of Company/Bidder	Signature over Printed Name of Authorized Representative	Date
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**REVISED
ANNEX D19**

Lot No.	Lot	Code	Item	Agency Specification	Classification	Test Procedure (Post Evaluation)	Test Procedure (Inspection and Acceptance)	English Manual
19	Software: Productivity	19-001	Adobe Creative Cloud All Apps	<ul style="list-style-type: none"> • OS: Multiple Platform • Language: Multi-Asian Language • Product Type: Team Licensing/Enterprise Licensing • Duration: 3 Years • Transferable license as managed by the institutions • Includes 2 weeks training on the use of different adobe products as applied in photo editing, video editing, illustration, graphic design and layout for branding and marketing materials • Includes 7 teachers license • Includes Certificate of authority to sell from the manufacturer or local distributor/reseller • Training will be delivered by Adobe Certified Professional 	Software	Evaluation of Brochure with picture and/or data sheet and training proposal	<ul style="list-style-type: none"> - Checking the conformity with the quantity - Checking the conformity of software vis-a-vis offered specifications - Functionality testing 	Yes
19	Software: Productivity	19-002	Microsoft 365	<p>For Windows and MAC 2-6 users per license for 5-year subscription or equivalent Certificate of authority to sell from the manufacturer or local distributor/reseller Includes MS Word, MS Excel, MS PowerPoint, Outlook, Teams and PowerBI</p>	Software		<ul style="list-style-type: none"> - Checking the conformity with the quantity - Checking the conformity of software vis-a-vis offered specifications - Functionality testing 	Yes

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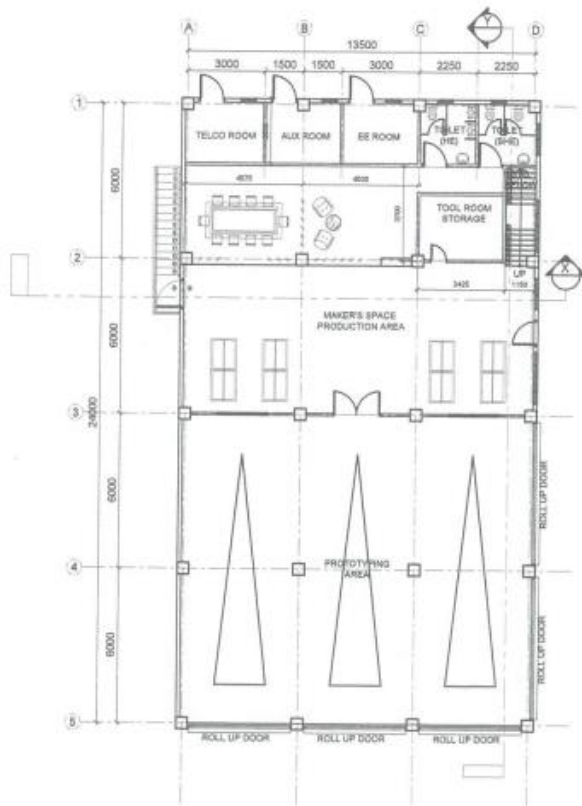
Name of Company/Bidder

Signature over Printed Name of Authorized
Representative

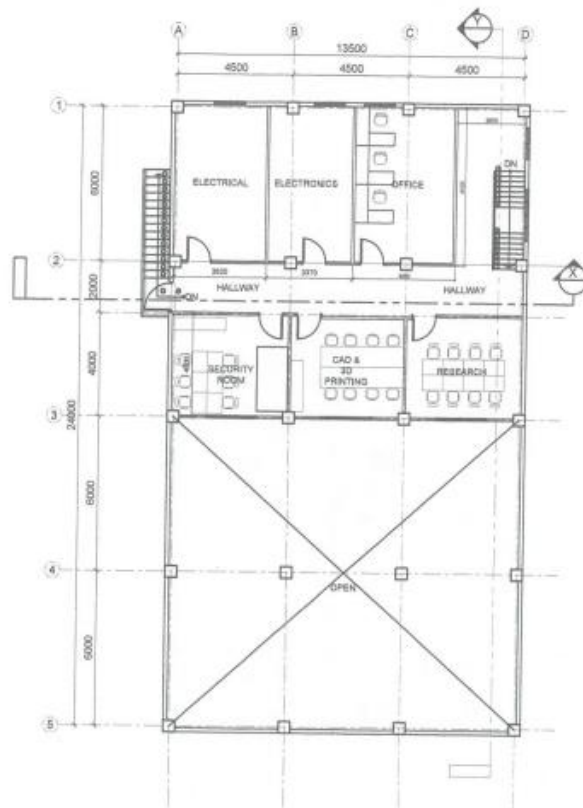
Date

TECHNICAL PLANS

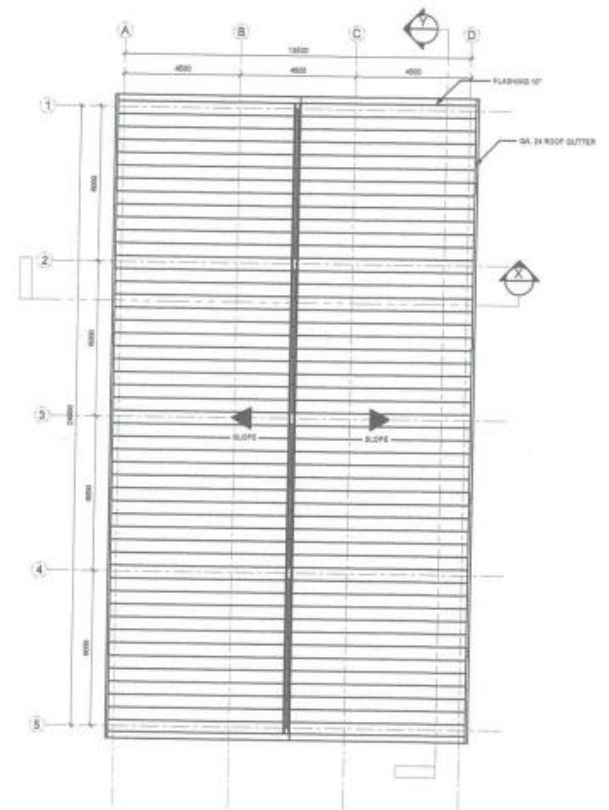
PTC-Urdaneta, Urdaneta City, Pangasinan



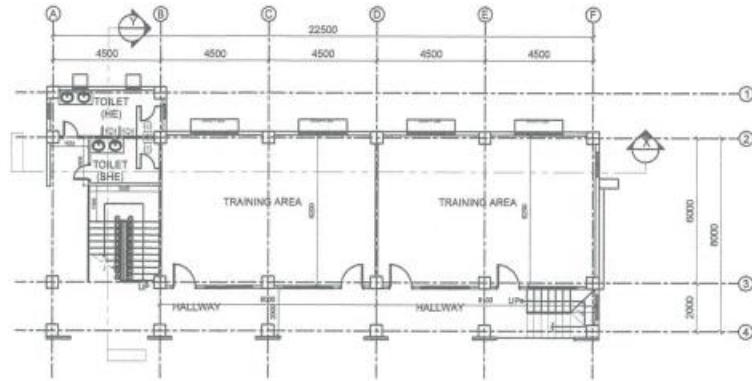
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PROPOSED GROUND FLOOR PLAN
 SCALE 1:200MTS



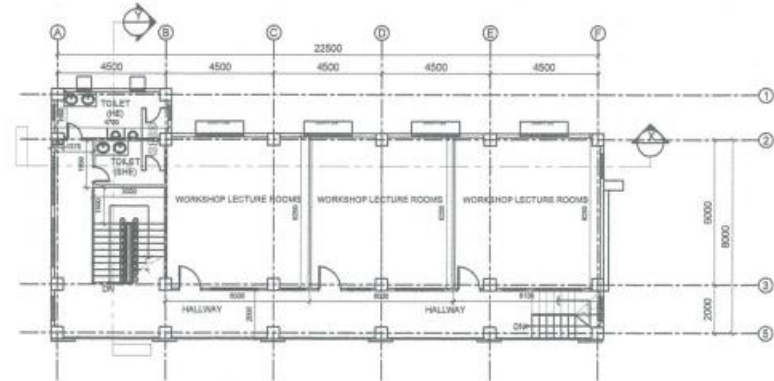
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 SCALE 1:200MTS



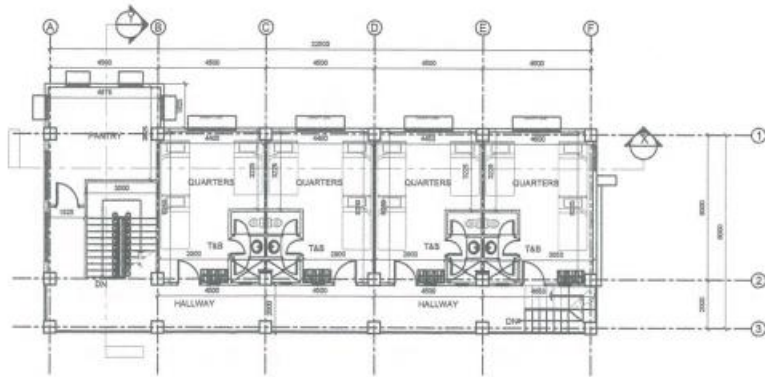
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PROPOSED ROOF PLAN
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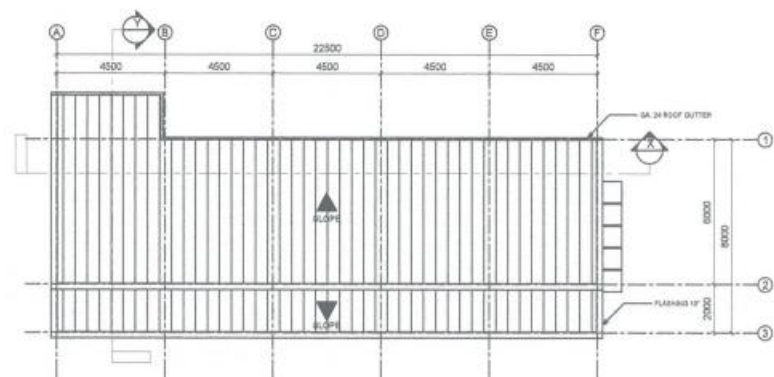
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PROPOSED GROUND FLOOR PLAN
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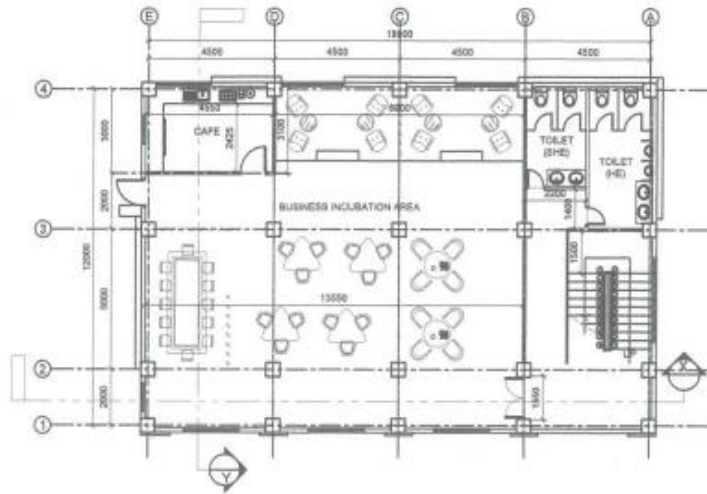
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PROPOSED SECOND FLOOR PLAN
 SCALE 1:200MTS



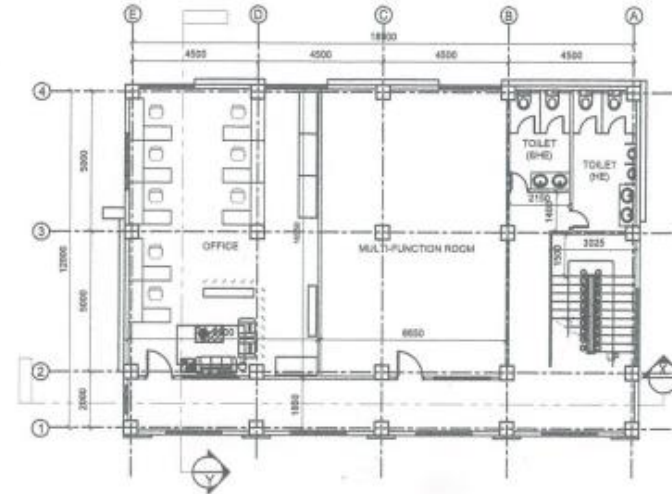
PTC URDANETA-BUILDING B
PROPOSED THIRD FLOOR PLAN
 SCALE 1:200MTS



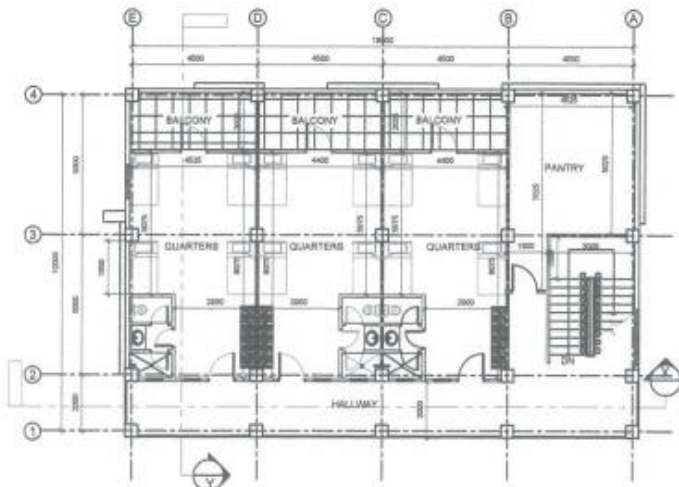
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PROPOSED ROOF PLAN
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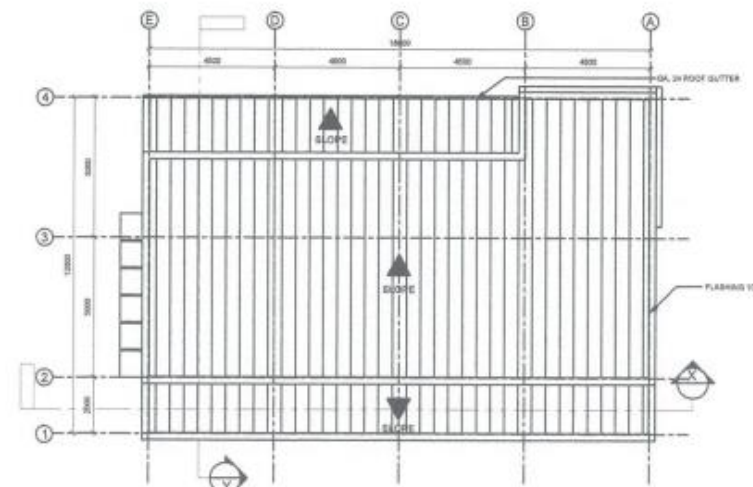
A PTC URDANETA-BUILDING C
PROPOSED GROUND FLOOR PLAN
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A PTC URDANETA-BUILDING C
PROPOSED SECOND FLOOR PLAN
 SCALE 1:200MTS

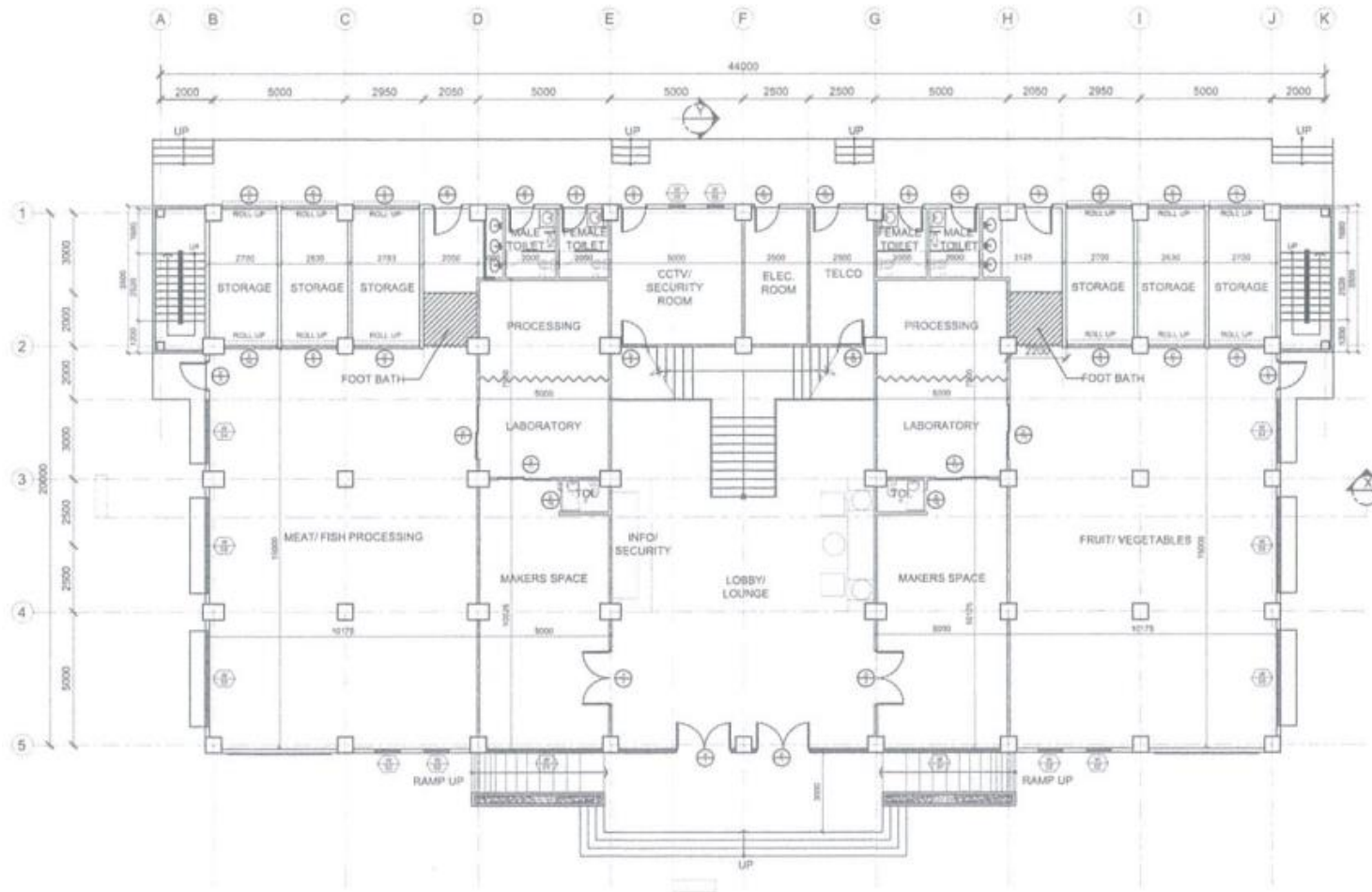


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PROPOSED THIRD FLOOR PLAN
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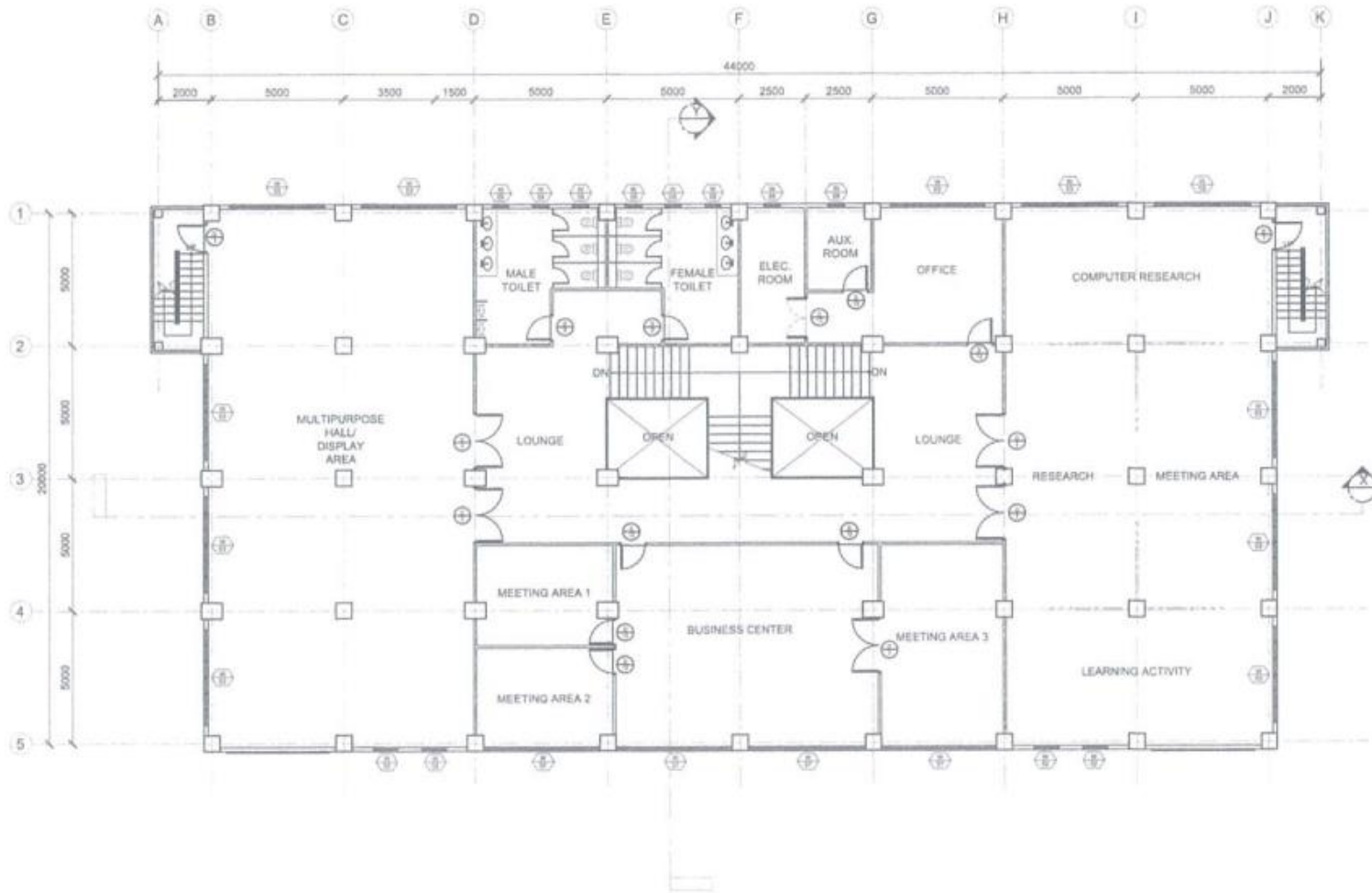


A PTC URDANETA-BUILDING C
PROPOSED ROOF PLAN
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Isabela School of Arts and Trades, Calamagui II, Isabela

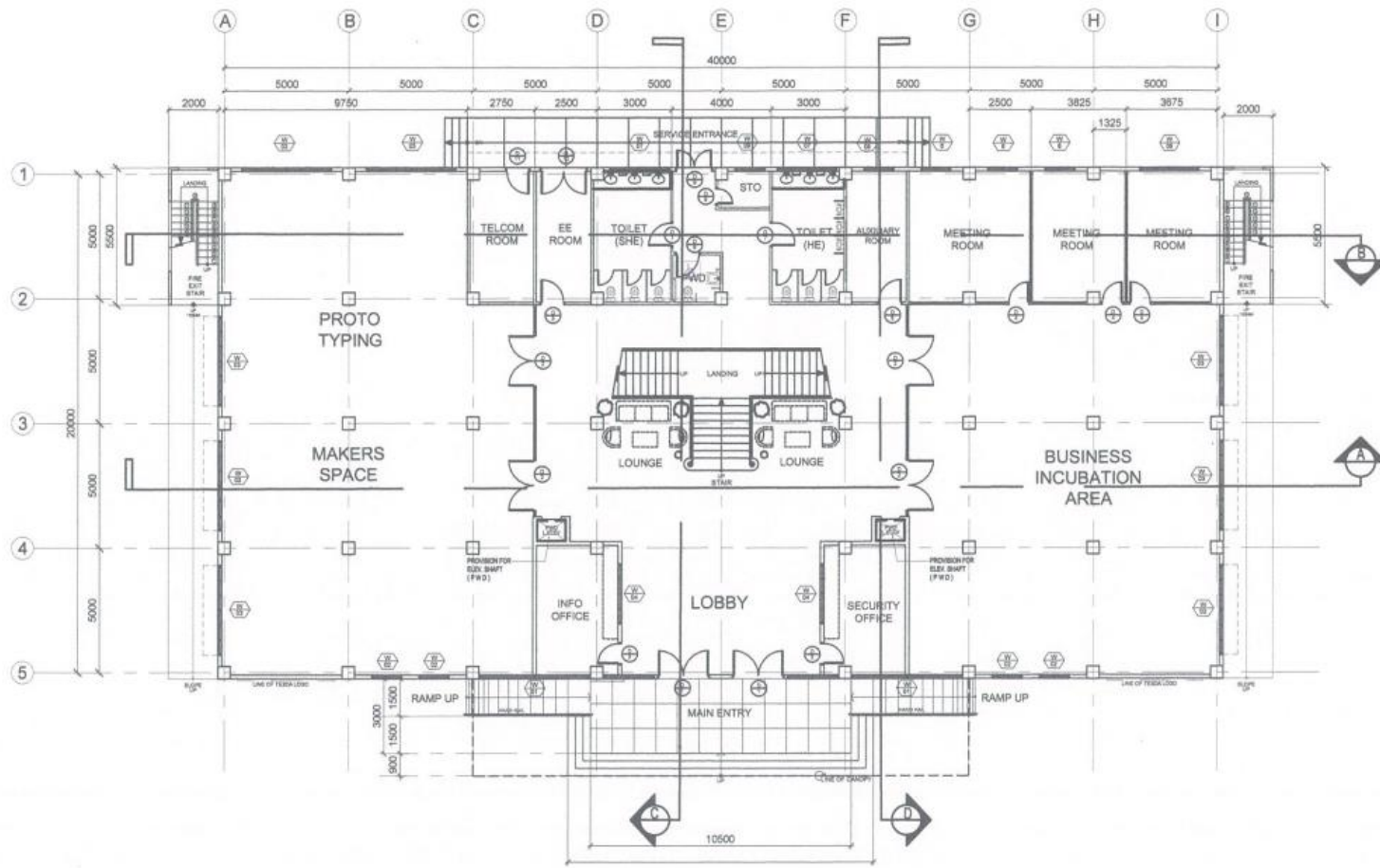



TESDA INNOVATION CENTER - ISAT
PROPOSED GROUND FLOOR PLAN
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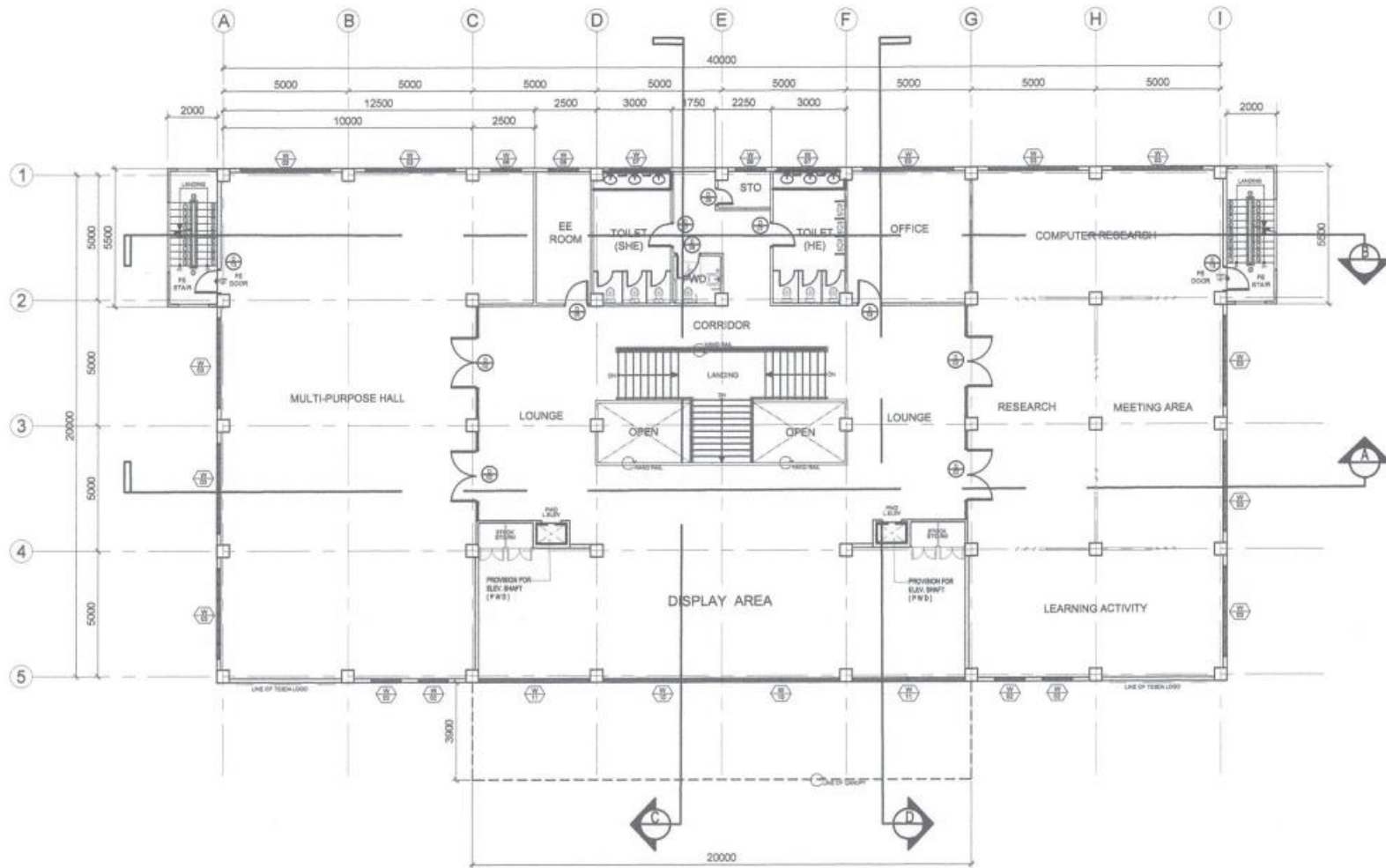


TESDA INNOVATION CENTER - ISAT
PROPOSED SECOND FLOOR PLAN
 SCALE 1:200MTS

RTC-Mariveles, Camaya, Mariveles, Bataan

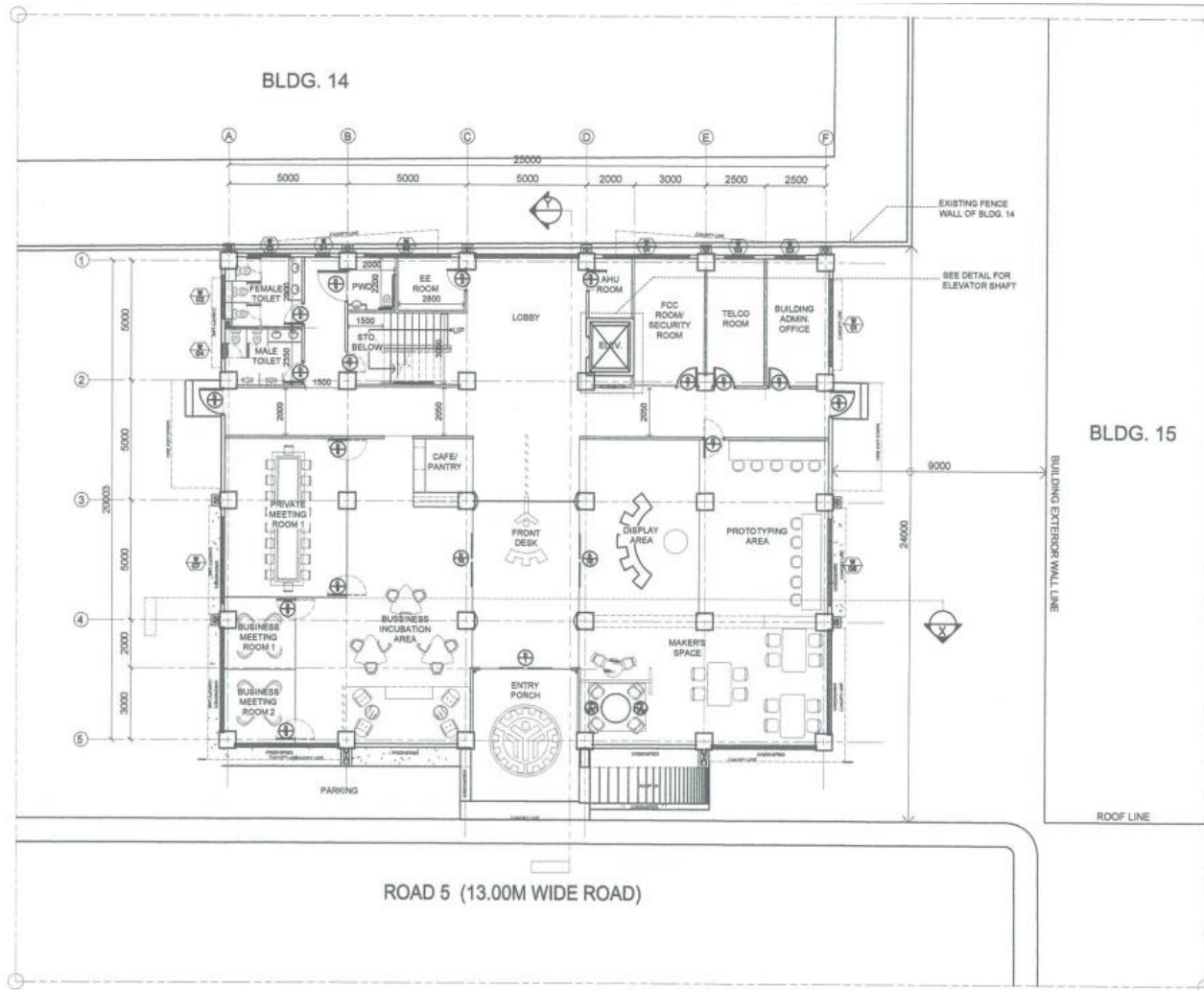


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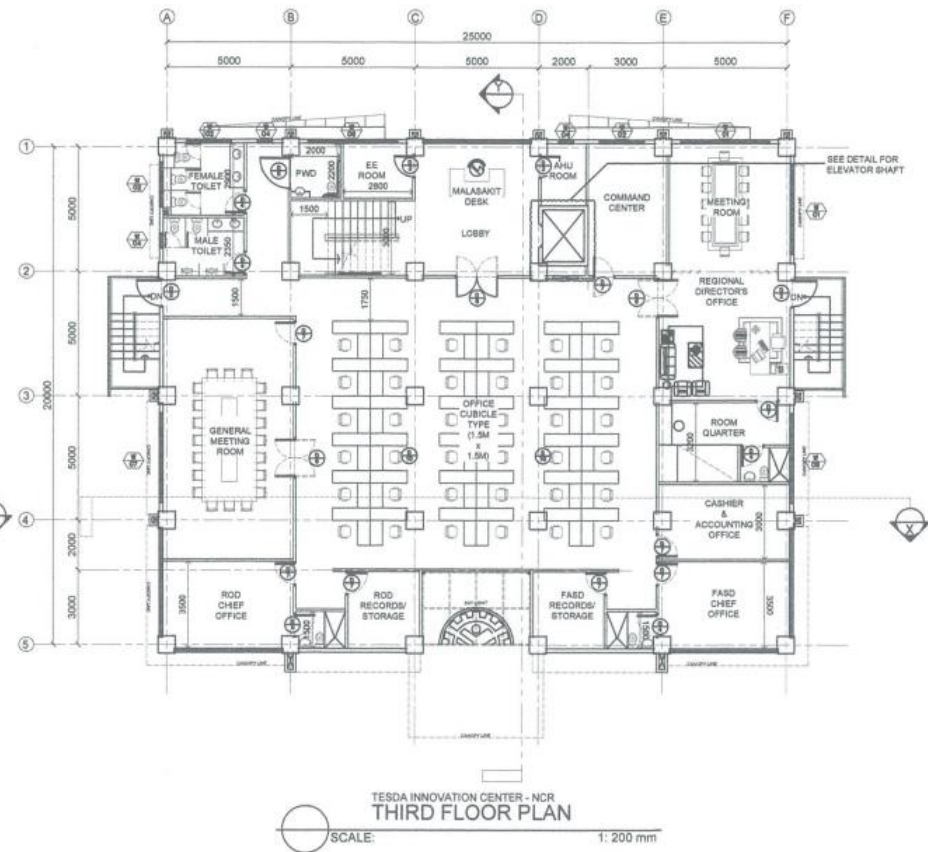
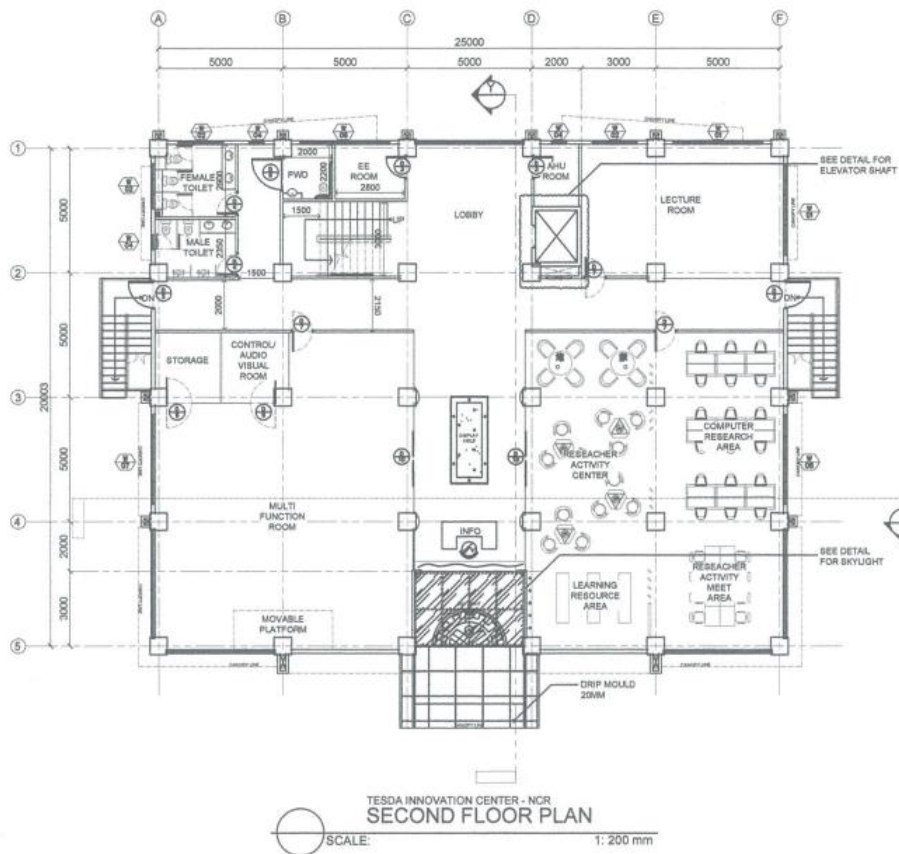


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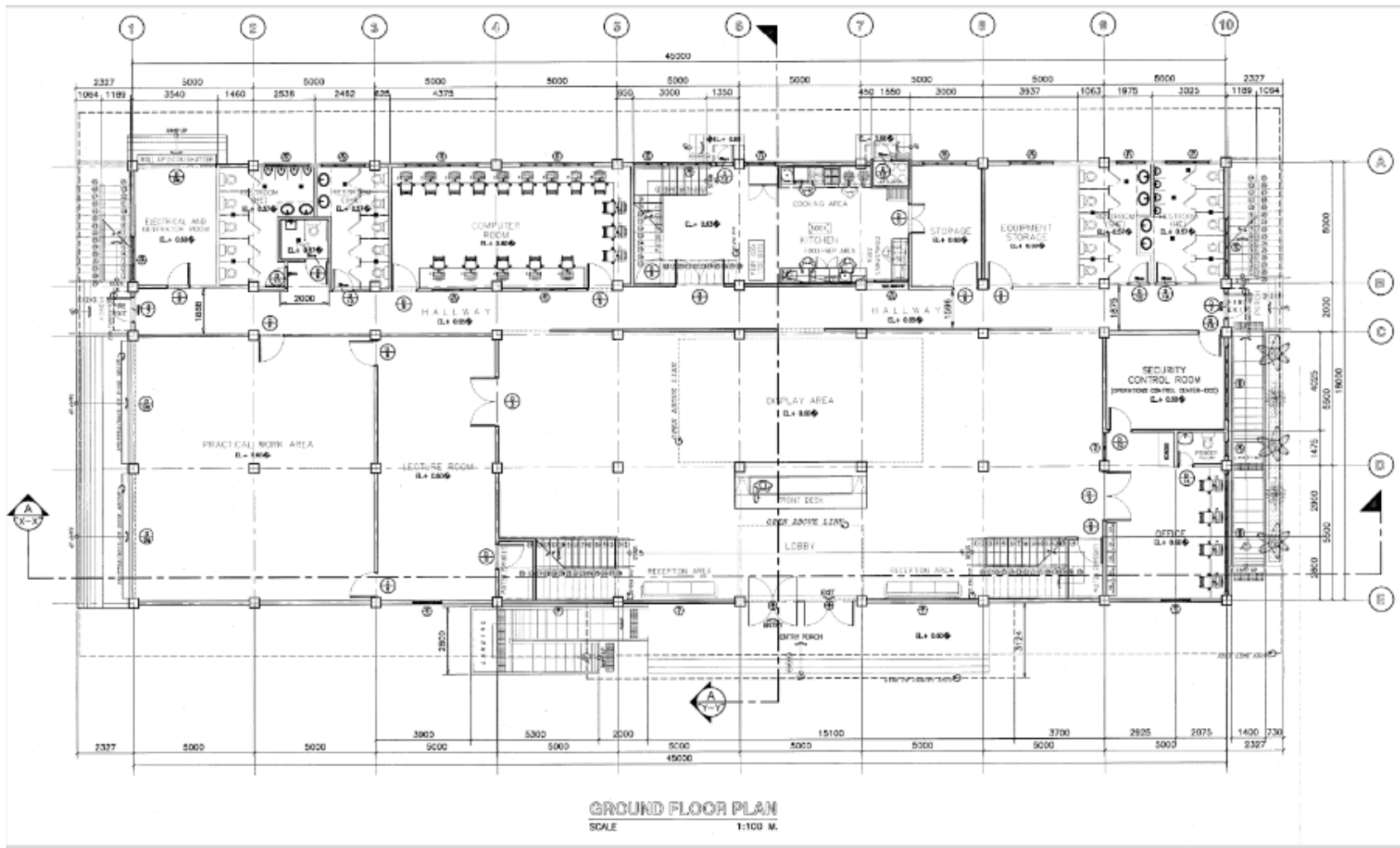
RTC-NCR, Gate 2, TESDA Compound, Taguig City



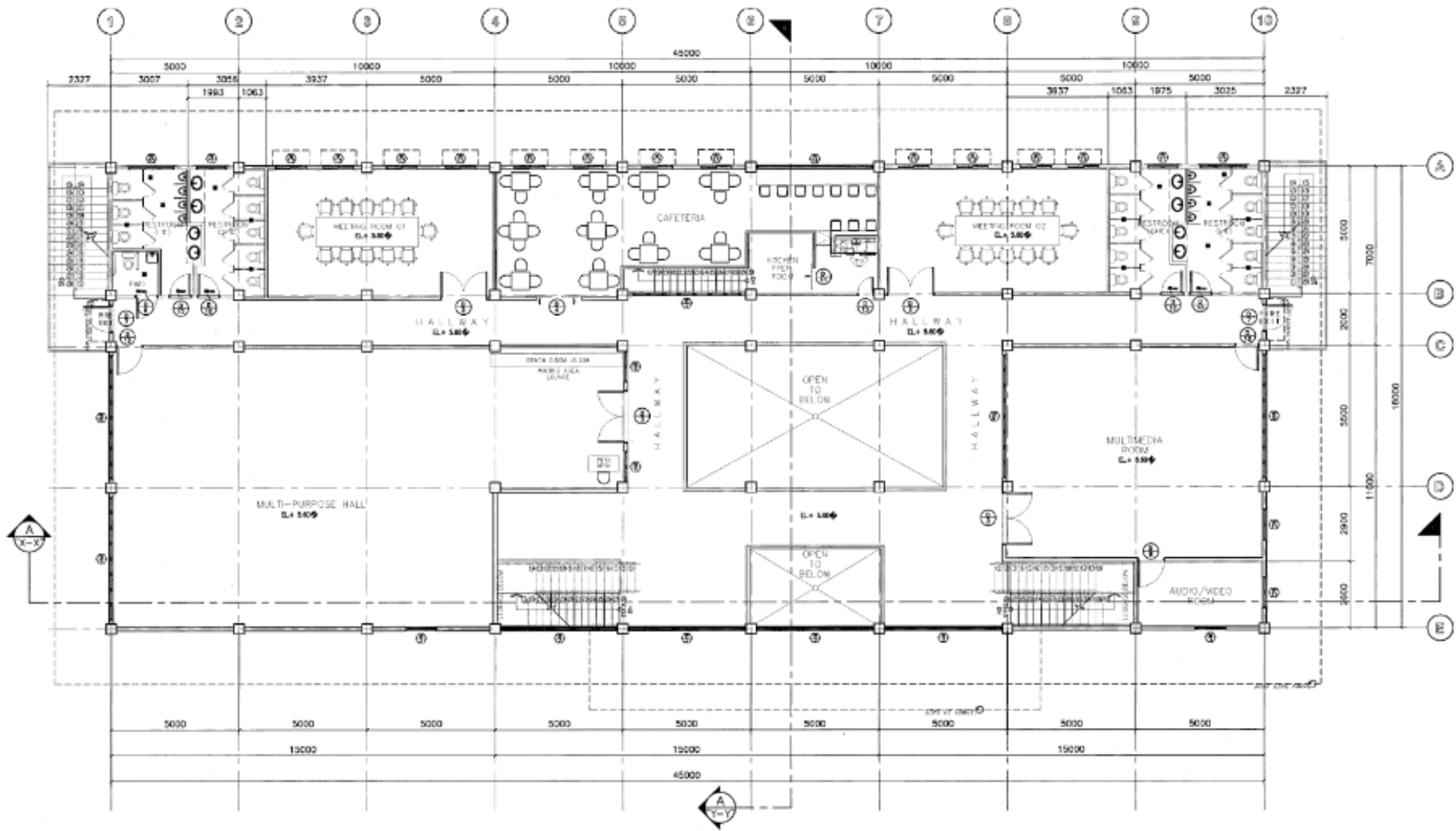
TESDA INNOVATION CENTER - NCR
GROUND FLOOR PLAN ON SITE
 SCALE: 1: 200 mm



RTC-Cebu, Cebu City
Balicutro College of Arts and Trades, Allen, Samar
Zamboanga Sibugay Polytechnic Institute, Kabasalan, Zamboanga Sibugay



GROUND FLOOR PLAN
SCALE 1:100 M.



SECOND FLOOR PLAN
SCALE 1:100 M.