



**DOST-ASTI Bids and Awards Committee
Invitation to Bid (Public Bidding)**

IB No:	23-11-4621	Date:	November-06-2023
PR No:	ROAMER-23-10-17843	Date:	October-25-2023
Source of Funds:			
Total ABC:	Php 1,078,120.00		
Time, Date & Venue of Pre-bid Conference:	November 15, 2023, 9:00 AM at Videoconferencing (MS Teams)		
Time and Date of Submission of Bids:	November 28, 2023, 09:00 AM		
Time, Date & Venue of Opening Bids:	November 28, 2023, 9:30 AM at DOST-ASTI and Videoconferencing (MS Teams)		
Date of availability of Complete Set of Documents:	November 08, 2023		
Deadline of Potential Bidder's Clarifications:	November 18, 2023		
Deadline of ASTI's Supplemental Bid Bulletin:	November 21, 2023		
Delivery Schedule:			

The *Department of Science and Technology (DOST) - Advanced Science and Technology Institute (ASTI)*, through its Bids and Awards Committee (BAC), hereby invites all interested Bidders to submit their bids for the *item/s* listed below. *Section II. Instructions to Bidders (ITB) of the DOST-ASTI Bidding Documents provides information necessary for bidders to prepare responsive bids, in accordance with the requirements of DOST-ASTI. The ITB likewise provides information on bid submission, eligibility check, opening and evaluation of bids, post-qualification, and award of contract.*

Bidding will be conducted through open competitive bidding procedures *using a non-discretionary "pass/fail" criterion as specified in the 2016 revised Implementing Rules and Regulations of Republic Act No. 9184.*

A complete set of *DOST-ASTI Bidding Documents may be acquired by interested Bidders on the date and address given on this document, and upon payment of the applicable fee, pursuant to the latest Guidelines issued by the Government Procurement Policy Board. Further, the DOST-ASTI Bidding Documents may be accessed through the DOST-ASTI website (<https://asti.dost.gov.ph/>).*

For further inquiries, *you may contact the DOST-ASTI BAC Secretariat at telephone number +63 2 8249-8500 / +63 2 8426-9755 local 1206/1212 or send your message to bac-sec@asti.dost.gov.ph .*

Respectfully,

BAYANI BENJAMIN R. LARA
BAC Chairperson

NO.	TECHNICAL SPECIFICATIONS	QTY	UNIT	UNIT PRICE(Php)	TOTAL PRICE(Php)
1	<p>Various Technical Supplies</p> <p>1. Objective</p> <p>1.1. DOST-ASTI intends to procure various technical supplies for research and development.</p> <p>1.2. The Approved Budget for the Contract (ABC) is inclusive of government taxes and other charges.</p> <p>2. Technical Specifications</p> <p>2.1. Threadlocker Adhesive</p> <p>2.1.1. Quantity: One (1) bottle</p> <p>2.1.2. Size: 50 mL</p> <p>2.1.3. General purpose medium strength threadlocking adhesive</p>	1	lot	193430.00	193,430.00

- 2.1.4. Prevents loosening and leakage from shock & vibration
- 2.1.5. Works on all metals, including passive substrates
- 2.1.6. Can tolerate minor contamination by industrial oils
- 2.1.7. Permits disassembly with hand tools for servicing
- 2.1.8. Color: Blue
- 2.1.9. Physical form: Liquid
- 2.1.10. Cure type: Anaerobic Cure
- 2.1.11. Cure speed:
 - 2.1.11.1. Fixture: Approximately 10 minutes
 - 2.1.11.2. Full: Approximately 24 hours
- 2.1.12. Maximum Thread Size: M6 to M20 (1/4" to 3/4")
- 2.1.13. Application Temperature: -55.0 to 180.0 °C (-65.0 to 360.0 °F)
- 2.1.14. Breakaway torque, M10 Steel Nuts/Bolts: 26.0 N-m (230.0 in./lb.) or better
- 2.1.15. Prevail torque, M10 Steel Nuts/Bolts: 5.0 N-m (40.0 in./lb.) or better
- 2.1.16. Authentic product

- 2.2. Lock Nut – M3
 - 2.2.1. Quantity: Ten (10) packs
 - 2.2.2. Quantity per Pack: Ten (10) pieces
 - 2.2.3. Nut Type: Self-locking
 - 2.2.4. Thread Size: M3
 - 2.2.5. Material: Steel
 - 2.2.6. Type: Nylon Insert
 - 2.2.7. Finish: Bright Zinc Plated

- 2.3. HDMI Capture Card
 - 2.3.1. Quantity: One (1) piece
 - 2.3.2. USB Audio/Video Capture Card
 - 2.3.3. Input Port: HDMI (4k/60Hz)
 - 2.3.4. Output Port: USB Type A and Type C (1080P/30Hz), Dual Port
 - 2.3.5. Shell Material: Aluminum Alloy
 - 2.3.6. Audio: Audio and video synchronization

- 2.4. Cable Tie
 - 2.4.1. Quantity: Five (5) packs
 - 2.4.2. Quantity per Pack: One hundred (100) pieces
 - 2.4.3. Size: 2.5 x 100mm
 - 2.4.4. Material: Nylon
 - 2.4.5. Self-locking, UV resistant

- 2.5. Two-Way Radio
 - 2.5.1. Quantity: Three (3) pieces
 - 2.5.2. Frequency Range: UHF 400 – 470 MHz
 - 2.5.3. No. of Channels: Sixteen (16) or better
 - 2.5.4. Operating Voltage: 3.7VDC
 - 2.5.5. Operating Temperature: -20 to 50 °C
 - 2.5.6. Mode of Operation: Simplex
 - 2.5.7. Antenna Impedance: 50Ω
 - 2.5.8. Transmitter
 - 2.5.8.1. RF Power: 2W
 - 2.5.8.2. Maximum Deviation: ≤ ±5KHz
 - 2.5.8.3. Spurious Emission: ≤ -60dB or better

- 2.5.8.4. Transmission Current: $\leq 1000\text{mA}$
- 2.5.8.5. Pre-emphasis Character: 6dB per Octave
- 2.5.9. Receiver
 - 2.5.9.1. Sensitivity: $< 0.16\mu\text{v}$ (12dB SINAD)
 - 2.5.9.2. Squelch Sensitivity: $< 0.2\mu\text{v}$
 - 2.5.9.3. Audio Power: $\geq 380\text{mW}$
 - 2.5.9.4. Audio Distortion: $< 10\%$
 - 2.5.9.5. Intermediation (W/N): $\geq 65\text{dB}$
 - 2.5.9.6. Receiver Current: $\leq 380\text{mA}$
- 2.5.10. Items included
 - 2.5.10.1. Headset
 - 2.5.10.2. XT-2 radio
 - 2.5.10.3. Battery
 - 2.5.10.4. Belt clip
 - 2.5.10.5. Charger
 - 2.5.10.6. Manual
- 2.5.11. Other features
 - 2.5.11.1. 50 groups CTCSS, 105 groups standard DCS
 - 2.5.11.2. Time out timer (TOT)
 - 2.5.11.3. Wide/Narrow band
 - 2.5.11.4. Battery saving function
 - 2.5.11.5. Busy channel lock out (BCL)
 - 2.5.11.6. Low battery voltage warning
 - 2.5.11.7. Programmable by PC
 - 2.5.11.8. NTC approved
- 2.6. External SSD – 2TB
 - 2.6.1. Quantity: Two (2) pieces
 - 2.6.2. Portable 2TB External SSD Storage
 - 2.6.3. Capacity: At least 2TB
 - 2.6.4. Interface: USB 3.2 Gen 2
 - 2.6.5. Connector: USB-C
 - 2.6.6. Compatibility: USB 3.2 Gen 2 (10Gb/s), USB 3.0, USB 2.0
 - 2.6.7. Contents
 - 2.6.7.1. Portable SSD
 - 2.6.7.2. USB-C to USB-C Cable
 - 2.6.7.3. USB-C to USB-A Adaptor
 - 2.6.7.4. Safety and Warranty Guide
 - 2.6.8. Certifications: CE, FCC, RCM, BSMI, EAC, UKCA, ICES, BIS or better
 - 2.6.9. IP Rating: IP55 or better
 - 2.6.10. Durability: Up to two-meter drop protection
- 2.7. PCIE to M.2 (NVME) Adapter
 - 2.7.1. Quantity: One (1) piece
 - 2.7.2. Case: Full-Aluminum Case
 - 2.7.3. Input Interface: M.2 NVME Key-M
 - 2.7.4. Output Interface: PCIE X16
 - 2.7.5. Supports Industrial Operating Temperature Range: -40 to $85\text{ }^{\circ}\text{C}$ or better
 - 2.7.6. Supports PCIe Gen4/Gen3/Gen2 M.2 NVME 80mm SSD
 - 2.7.7. Contents
 - 2.7.7.1. One (1) PCIE Card
 - 2.7.7.2. One (1) Screwdriver
 - 2.7.7.3. Two (2) Thermal Compound Pad
 - 2.7.7.4. One (1) Aluminum case
- 2.8. SO-239 Female Jack Square Shape Solder Cup

Coax Connector

- 2.8.1. Quantity: Ten (10) pieces
- 2.8.2. UHF SO-239 Female Coax Connector
- 2.8.3. Type: Mini UHF Male to N Female
- 2.8.4. Usable for connecting a SO-239 to N Male jack
- 2.8.5. Usable for antennas, broadcast, radios, telecom, coaxial cable, LMR, CCTV, miniwave applications, and digital communication systems

2.9. Brass Tube

- 2.9.1. Quantity: Ten (10) pieces
- 2.9.2. Material: Brass
- 2.9.3. Inner Diameter: 4 mm
- 2.9.4. Length: 300 mm
- 2.9.5. Wall Thickness: 0.45 mm

2.10. Aluminum Tube

- 2.10.1. Quantity: One (1) roll
- 2.10.2. Material: Aluminum
- 2.10.3. Length: 20 feet
- 2.10.4. Size: 1/4"

2.11. Sleeping Bag

- 2.11.1. Quantity: Five (5) pieces
- 2.11.2. Material: Fabric
- 2.11.3. Dimension: Approximately 190 cm x 30 cm x 75 cm
- 2.11.4. Temperature Limit (Lowest): -5 °C
- 2.11.5. Waterproof, with water repellent coating
- 2.11.6. Weight: Approximately 1kg
- 2.11.7. Lightweight and portable
- 2.11.8. Suitable for camping, hiking, and overnight stays
- 2.11.9. Loose and tight setting for wind and temperature control
- 2.11.10. Double zipper for convenient closing and opening

2.12. First Aid Kit

- 2.12.1. Quantity: Two (2) sets
- 2.12.2. Emergency First Aid Kit
- 2.12.3. Kit contents
 - 2.12.3.1. Two (2) pieces 3x3 gauze pads or better
 - 2.12.3.2. One (1) bottle hydrogen peroxide 10% 120 mL or better
 - 2.12.3.3. One (1) box adhesive bandage strips 12's or better
 - 2.12.3.4. One (1) bottle povidone iodine 15 mL or better
 - 2.12.3.5. One (1) roll 1.25 cm x 9 m paper tape or better
 - 2.12.3.6. One (1) roll cotton, 10 grams or better
 - 2.12.3.7. Two (2) pieces 2x6 gauze bandages or better
 - 2.12.3.8. One (1) bottle isopropyl alcohol 60 mL or better
 - 2.12.3.9. Three (3) pieces face mask or better
 - 2.12.3.10. Two (2) tablets water purification tablet or better
 - 2.12.3.11. One (1) piece flashlight with whistle or better

- 2.13. Collapsible Water Container (10L)
 - 2.13.1. Quantity: Two (2) pieces
 - 2.13.2. Material: Food-grade PVC, BPA-free, no taste or smell
 - 2.13.3. Capacity: 10L
 - 2.13.4. Screw-on cap
 - 2.13.5. Durable handle
 - 2.13.6. Foldable and lightweight

- 2.14. USB Hub
 - 2.14.1. Quantity: One (1) piece
 - 2.14.2. 9-in-1 USB Type C Hub
 - 2.14.3. Color: Grey (Preferred)
 - 2.14.4. Interface: USB-C/HDMI/USB-C Gen 1/USB 3.0/RJ45/SD/TF/TRRS 3.5mm/PD
 - 2.14.5. Interface Contacts: Nickel-plated
 - 2.14.6. Resolution: 4K@30Hz or better
 - 2.14.7. USB Transmission Speed Rate: 5 Gbps (USB-C Gen 1)/5 Gbps (USB 3.0)
 - 2.14.8. Conductor: Tinned copper
 - 2.14.9. Network Speed: 10/100/1000Mbps
 - 2.14.10. Audio Port: 48K@16bit; OMTP & CTIA
 - 2.14.11. Card Version: 2.0 UHS-I SD/TF
 - 2.14.12. Compatible Memory Card: Micro SD/Micro SDHC/Micro SDXC/SDHC/SDXC
 - 2.14.13. Card Read: 2.0 Single Card Read
 - 2.14.14. Shell: Aluminum Alloy
 - 2.14.15. Charging: PD 100W or better

- 2.15. Hard Carrying Case for Equipment Transport
 - 2.15.1. Quantity: One (1) piece
 - 2.15.2. Travel hard case for equipment
 - 2.15.3. Material: TSU-1 Resin
 - 2.15.4. IP Rating: IP67
 - 2.15.5. External Dimension (L x W x D): Approx. 16.1 in x 13.5 in x 8.0 in (41.0 x 34.2 x 20.4 cm)
 - 2.15.6. Internal Dimension (L x W x D): Approx. 15.0 in x 10.7 in x 6.9 in (38.2 x 27.1 x 17.5cm)
 - 2.15.7. Lid Depth: Approximately 4.4cm
 - 2.15.8. Bottom Depth: Approximately 13.1cm

- 2.16. Mobot Waterproof Cover
 - 2.16.1. Quantity: Two (2) pieces
 - 2.16.2. Waterproof cover suitable for mobile robot (mobot) platform
 - 2.16.3. Material: Thick PVC
 - 2.16.4. Color: Black (Preferred)
 - 2.16.5. Waterproof
 - 2.16.6. Container pouch/packet

- 2.17. Ball Bearing
 - 2.17.1. Quantity: Six (6) pieces
 - 2.17.2. Inside Diameter: 8 mm
 - 2.17.3. Outside Diameter: 22 mm
 - 2.17.4. Race Width: 7 mm
 - 2.17.5. Ball Bearing Type: Deep Groove
 - 2.17.6. End Type: Sealed
 - 2.17.7. Number of Rows: 1
 - 2.17.8. Static Load Rating: 1.379kN
 - 2.17.9. Material: Steel

- 2.17.10. Race Type: Plain
- 2.17.11. Dynamic Load Rating: 3.293kN
- 2.17.12. Bore Type: Parallel

- 2.18. Aluminum T-Slot Nut - M3
 - 2.18.1. Quantity: Four (4) packs
 - 2.18.2. Quantity per Pack: Twenty (20) pieces
 - 2.18.3. Track Sliding T-Nuts
 - 2.18.4. Thread Size: M3
 - 2.18.5. Profile Size: 20
 - 2.18.6. Material: Carbon Steel

- 2.19. Vector Network Analyzer
 - 2.19.1. Quantity: One (1) set
 - 2.19.2. Vector Network Analyzer Set
 - 2.19.3. Measurement Frequency Range: 50KHz-3GHz or better
 - 2.19.4. Frequency Tolerance: less than 2ppm
 - 2.19.5. Frequency Stability: less than 0.5ppm
 - 2.19.6. System Dynamic Range (Calibration): 70dB (up to 1.5GHz), 60dB (up to 3GHz) or better
 - 2.19.7. S11 Noise Floor (Calibration): -50dB (up to 1.5GHz), -40dB (up to 3GHz) or better
 - 2.19.8. Sweep Rate: 100 points / second or better
 - 2.19.9. Display: 4.0 inch, 320 * 480
 - 2.19.10. USB Interface: Micro USB
 - 2.19.11. Power Supply: USB, maximum charging current 1A
 - 2.19.12. Battery Connector: JST-XH 2.54mm
 - 2.19.13. Maximum Sweep Points (on device): 201 or better
 - 2.19.14. Maximum Sweep Points (USB): 1024 or better
 - 2.19.15. Port 2 Return Loss (1.5GHz): 20dB typical or better
 - 2.19.16. Port 2 Return Loss (3GHz): 13dB min or better
 - 2.19.17. 3000 mAh lithium battery included

- 2.20. 18650 Battery
 - 2.20.1. Quantity: Two hundred (200) pieces
 - 2.20.2. 18650 3.7V 3350 mAh Li-ion Rechargeable Battery
 - 2.20.3. Authentic product
 - 2.20.4. Nominal Voltage: 3.7V
 - 2.20.5. Storage Voltage: 3.7-3.9V
 - 2.20.6. Charging Cut-off Voltage: 4.2V
 - 2.20.7. Discharge Cut-off Voltage: 3.0V
 - 2.20.8. Capacity: At least 3350 mAh
 - 2.20.9. Size: 18*65.0mm
 - 2.20.10. Battery Top: Flat top
 - 2.20.11. Material: Lithium Li-ion ICR
 - 2.20.12. Recharging Cycles: At least 1000 cycles

- 2.21. MicroSD Card
 - 2.21.1. Quantity: Five (5) pieces
 - 2.21.2. Authentic product
 - 2.21.3. Fast Transfer Speeds: Up to 80 MB/s
 - 2.21.4. Class 10 for Full HD
 - 2.21.5. Waterproof, X-ray proof, temperature proof, and shockproof

- 2.21.6. SD adapter included for compatibility
- 2.21.7. Capacity: At least 32 GB
- 2.21.8. Form Factor: microSDHC

- 2.22. MicroSD Card Module
 - 2.22.1. Quantity: Five (5) pieces
 - 2.22.2. MicroSD Card Module for data storing or data logging application
 - 2.22.3. Includes an on-board voltage level conversion for easy interface with 3V or 5V devices
 - 2.22.4. Communication: SPI interface.
 - 2.22.5. Power Supply: 4.5V ~ 5.5V

- 2.23. 18650 Battery Holder - 3-Cell
 - 2.23.1. Quantity: Five (5) pieces
 - 2.23.2. 3-cell Holder for 18650 Batteries
 - 2.23.3. Takes 3 standard sized 18650 batteries side by side to form a compact battery of 3.7Vx3 = 11.1V
 - 2.23.4. Embossed polarity marks
 - 2.23.5. Color: Black (Preferred)
 - 2.23.6. Battery Type: 3 pcs. 18650
 - 2.23.7. Dimensions: Approximately 7.70 cm x 6.10 cm x 2.10 cm (L x W x H)

- 2.24. Portable Power Station
 - 2.24.1. Quantity: One (1) unit
 - 2.24.2. Portable Rechargeable High-capacity Power Bank
 - 2.24.3. 12V Power Outlet with overload protection
 - 2.24.4. Digital display for input/output voltage frequency/power consumption
 - 2.24.5. Charging Port for solar panel up to 60watts or better
 - 2.24.6. Built-in LED work light
 - 2.24.7. Connector cable for jump start cable or connection for external battery
 - 2.24.8. Capacity: 400 Watts or better
 - 2.24.9. Battery: 1 x 24 Ah / 12V DC Sealed Lead Acid or better
 - 2.24.10. Battery Life on Full Load: 2 hours or better
 - 2.24.11. AC Output: 2 x 220VAC Outlet or better
 - 2.24.12. DC Output
 - 2.24.12.1. One (1) 12VDC Socket or better
 - 2.24.12.2. Two (2) 12VDC Jack or better
 - 2.24.13. Three (3) USB Sockets or better
 - 2.24.14. LED Light: 1.5 Watts
 - 2.24.15. LED Display: AC Voltage, Frequency, Power, Battery
 - 2.24.16. Car Jumper: 1 Set Alligator Clips

- 2.25. Portable Laptop Tripod Stand
 - 2.25.1. Quantity: One (1) piece
 - 2.25.2. Multifunctional tripod suitable for projector, laptop, tablets, etc.
 - 2.25.3. Adjustable height
 - 2.25.4. Made from high-quality metal, stable triangle structure with anti-slip feet pads design, sturdy and durable
 - 2.25.5. Comes with a plate for placing mouse or other small items, very handy and space-saving
 - 2.25.6. Color: Black (Preferred)

- 2.25.7. Material: Metal
- 2.25.8. Tripod Height: Adjustable (50cm/19.6", 71cm/27.9", 96cm/37.7", 124cm/48.8", 149cm/58.6")
- 2.25.9. Tripod Weight: 1.254kg/ 2.7lbs
- 2.25.10. Package Size: 61.5 * 27 * 11.5cm/ 24.2 * 10.6 * 4.5"
- 2.25.11. Package Weight: 1.787kg/ 3.9lbs

2.26. Trash Bin

- 2.26.1. Quantity: Three (3) pieces
- 2.26.2. Cover type: Swing
- 2.26.3. Capacity: 50 L
- 2.26.4. Dimensions (L x W x H): Approximately 41.5 cm x 32 cm x 65.5 cm

2.27. USB 3.2 A to C Cable - at least 2 meters

- 2.27.1. Quantity: Three (3) pieces
- 2.27.2. Connector Type: USB-A to USB-C 3.2 Gen 2 Cable
- 2.27.3. Length: 2 meters (6.6 ft)
- 2.27.4. Data Transfer Speed: 10 Gbps
- 2.27.5. Fast Charging: 60W / 3A
- 2.27.6. Compatibility: USB 3.2, USB 3.1, USB 3.0, USB 2.0
- 2.27.7. Premium nylon-braided cord, aluminum alloy shell housing, reinforced tail connectors

2.28. GPS Handheld Navigator

- 2.28.1. Quantity: One (1) piece
- 2.28.2. Dimensions: 2.1 in x 4.0 in x 1.3 in (5.4 x 10.3 x 3.3 cm)
- 2.28.3. Display
 - 2.28.3.1. Display Size (W x H): 1.4 in x 1.7 in (3.6 x 4.3 cm); diagonally 2.2 in (5.6 cm)
 - 2.28.3.2. Display Resolution (W x H): 128 x 160 pixels
 - 2.28.3.3. Display Type: Transflective, monochrome
 - 2.28.3.4. Weight: 5 oz (141.7 g) with batteries
- 2.28.4. Battery
 - 2.28.4.1. Battery Type: Two (2) AA batteries
 - 2.28.4.2. Battery Life: 25 hours
- 2.28.5. Water Rating: IPX7
- 2.28.6. High-sensitivity receiver
- 2.28.7. Interface: USB
- 2.28.8. Maps and Memory
 - 2.28.8.1. With worldwide basemap
 - 2.28.8.2. With the ability to add additional points of interest; custom POIS
 - 2.28.8.3. Capacity
 - 2.28.8.3.1. 1000 waypoints, favorites, or locations
 - 2.28.8.3.2. 50 routes
 - 2.28.8.3.3. Track log 10,000 points, 100 saved tracks
- 2.28.9. Outdoor features
 - 2.28.9.1. Geocaching-friendly (paperless)
 - 2.28.9.2. With hunt or fish calendar
 - 2.28.9.3. With sun and moon information
 - 2.28.9.4. With area calculation
- 2.28.10. GPS and GLONASS satellites for faster positioning

2.29. Multi-Functional Wrench Knife Folding Tool

- 2.29.1. Quantity: One (1) piece

- 2.29.2. Material: Stainless steel
- 2.29.3. Tool Functions
 - 2.29.3.1. Needle-nose pliers
 - 2.29.3.2. Standard pliers
 - 2.29.3.3. Fine wire pliers
 - 2.29.3.4. Thick wire pliers
 - 2.29.3.5. Wood saw
 - 2.29.3.6. Wrench
 - 2.29.3.7. Main knife
 - 2.29.3.8. Screwdriver
- 2.29.4. Opening of the Adjustable Wrench: 22mm

- 2.30. Handheld True RMS Current Clamp Meters Tester
 - 2.30.1. Quantity: One (1) Piece
 - 2.30.2. Handheld True RMS AC/DC Current Clamp Meters Capacitance Tester
 - 2.30.3. Product Dimensions: 175 mm x 60 mm x 33.5 mm
 - 2.30.4. LCD Size: 39.3 mm x 21.5 mm
 - 2.30.5. Weight: 170g
 - 2.30.6. Display Count: 2000
 - 2.30.7. Jaw Capacity: 17mm
 - 2.30.8. Diode: Around 3.0V
 - 2.30.9. Auto Power Off: Around 15 Minutes
 - 2.30.10. Low Battery Indication: $\leq 2.5V$
 - 2.30.11. Input Impedance for DCV: $\geq 10M\Omega$
 - 2.30.12. Power: AAA 1.5V x 2 batteries, not included
 - 2.30.13. Features
 - 2.30.13.1. Auto range
 - 2.30.13.2. True RMS
 - 2.30.13.3. V.F.C.
 - 2.30.13.4. NCV
 - 2.30.13.5. Data hold
 - 2.30.13.6. Zero mode
 - 2.30.13.7. LCD backlight
 - 2.30.13.8. Input protection
 - 2.30.13.9. Continuity buzzer
 - 2.30.14. Measurable range
 - 2.30.14.1. AC Current (A): 2A/20A/100A $\pm(2.5\%+5)$
 - 2.30.14.2. DC Current (A): 2A/20A/100A $\pm(2\%+3)$
 - 2.30.14.3. AC Voltage (V): 2V /20V200V/600V $\pm(1.0\%+3)$
 - 2.30.14.4. DC Voltage (V): 200mV/2V/20V200V/600V $\pm(0.7\%+3)$
 - 2.30.14.5. Resistance (Ω): 200 Ω /2K Ω /20K Ω /200K Ω /2M Ω /20M Ω $\pm(1.0\%+2)$
 - 2.30.14.6. Capacitance (F): 2nF/20nF/200nF/2 μ F/20 μ F/200 μ F/2mF/20mF $\pm(4\%+5)$
 - 2.30.15. Package contents
 - 2.30.15.1. Handheld Clamp Multimeter, no battery included
 - 2.30.15.2. Test lead
 - 2.30.15.3. English manual

- 2.31. Display Splitter - HDMI (4 Ports)
 - 2.31.1. Quantity: One (1) piece
 - 2.31.2. Input Ports: 1 x HDMI female input port
 - 2.31.3. Output Ports: 4 x HDMI female output ports
 - 2.31.4. HDCP compliant: Yes
 - 2.31.5. Vertical Frequency Range: 60Hz

- 2.31.6. Video Formats Supported:
- 2.31.6.1. VGA: 640x480, 800x600, 1024x768, 1280x1024, 2048x1080, 7680x4320
- 2.31.6.2. DTV/HDTV: 480i, 480p, 576i, 576p, 720p, 1080i, 1080p, 4320
- 2.31.7. Supports resolution up to HDTV's 480p/720p/720p/1080i/1080p and PC's UXGA/1920x1200 and 4K
- 2.31.8. Supports 8 bits per channel (24 bits all channels)
- 2.31.9. Supports compressed audio
- 2.31.10. Supports 3D
- 2.32. 6S 18650 BMS Protection Board
- 2.32.1. Quantity: Five (5) pieces
- 2.32.2. Size: Approximately 50 x 32mm/1.97 x 1.26in
- 2.32.3. Max Discharge Current: 15A
- 2.32.4. Instantaneous Discharge Current: 25A
- 2.32.5. Charge Voltage: 25.5V
- 2.32.6. Charging Current: 15 A (Maximum)
- 2.32.7. Overcharge Detection Voltage: 4.28±0.05V
- 2.32.8. Overdischarge Detection Voltage: 2.55±0.08V
- 2.32.9. Overcurrent Detection Voltage: 150mV
- 2.32.10. Overcurrent Protection Current: 30±3A
- 2.33. 18650 Insulator Ring Sticker (Pack of 100)
- 2.33.1. Quantity: Five (5) packs
- 2.33.2. Quantity per Pack: One hundred (100) pieces
- 2.33.3. Material: Cardboard paper stickers
- 2.33.4. Self-adhesive, acid and alkali corrosion resistant, wear resistant
- 2.33.5. Provides insulation, shielding, and anti-interference
- 2.34. Fish Paper
- 2.34.1. Quantity: Three (3) rolls
- 2.34.2. Fibroid "fish paper" electrical insulation
- 2.34.3. Size: 10 inches by 24 inches (240 sq. in.)
- 2.34.4. Material: Vulcanized cellulose fiber
- 2.35. Silicone Coated 20AWG High Temp Copper Stranded Wire - 5 Color Set Spools
- 2.35.1. Quantity: Two (2) sets
- 2.35.2. Size: 20AWG
- 2.35.3. Length: 5 meters per color (25 meters total)
- 2.35.4. Colors: Green, Blue, Yellow, Black, Red
- 2.35.5. Conductor Material: Tinned copper wire
- 2.35.6. Conductor Type: Copper stranded wire
- 2.35.7. Temperature Range: 80 °C
- 2.35.8. Rated Voltage: 300V
- 2.35.9. Diameter of Each Copper Wire: 0.1 mm – 0.25 mm
- 2.35.10. Outer Diameter: 1.8mm
- 2.35.11. Insulation: PVC
- 2.35.12. Application: Internal wiring of electrical and electronic equipment
- 2.36. Stainless Steel Screw with Washer and Nut M16 x 70mm
- 2.36.1. Quantity: Twenty-five (25) pieces
- 2.36.2. Size: M16 Hex Cap Screw

- 2.36.3. Length: 70mm
- 2.36.4. Pitch: 2.0 mm
- 2.36.5. Drive: Hexagonal
- 2.36.6. Material: Stainless steel
- 2.36.7. Included: Nut, washer

2.37. Washer

- 2.37.1. Quantity: Twenty-five (25) pieces
- 2.37.2. Size: M16
- 2.37.3. Material: Stainless steel
- 2.37.4. Inside Diameter: 17 mm
- 2.37.5. Outside Diameter: 30 mm

2.38. TTL / USB Debugging Board for Servo Motor

- 2.38.1. Quantity: One (1) piece
- 2.38.2. Size: 25 mm x 40 mm
- 2.38.3. Compatible with BUS servo motors
- 2.38.4. Able to connect PC software and adjust the parameter of servo
- 2.38.5. Read the angle of the servo
- 2.38.6. Can connect TXD and RDX of single chip to control the servo

2.39. Double-Shaft Servo Frame/Bracket: Long U-shape Frame

- 2.39.1. Quantity: Five (5) pieces
- 2.39.2. Frame Type: Long U-shape
- 2.39.3. Material: Hard aluminum plate
- 2.39.4. Material Thickness: 2 mm
- 2.39.5. Size: 56 mm x 64 mm x 25 mm
- 2.39.6. Compatible with all series double-shaft servo

2.40. Double-Shaft Servo Frame/Bracket: Big Cross U-shape Frame

- 2.40.1. Quantity: Five (5) pieces
- 2.40.2. Frame Type: Big Cross U-shape
- 2.40.3. Material: Hard aluminum plate
- 2.40.4. Material Thickness: 1.5 mm
- 2.40.5. Size: 55 mm x 34 mm x 55 mm
- 2.40.6. Compatible with all series double-shaft servo

2.41. Double-Shaft Servo Frame/Bracket: Short U-shape Frame

- 2.41.1. Quantity: Five (5) pieces
- 2.41.2. Frame Type: Short U-shape
- 2.41.3. Material: Hard aluminum plate
- 2.41.4. Material Thickness: 2 mm
- 2.41.5. Size: 56 mm x 44 mm x 25 mm
- 2.41.6. Compatible with all series double-shaft servo

2.42. Double-shaft Servo Frame/Bracket: Metal Servo Horn

- 2.42.1. Quantity: Five (5) pieces
- 2.42.2. Metal Servo Horn
- 2.42.3. Material: Hard aluminum alloy
- 2.42.4. Surface: 3 mm
- 2.42.5. Height: 5 mm
- 2.42.6. Size: 20 mm x 20 mm
- 2.42.7. Compatible with all series double-shaft servo

	<p>2.43. Double-shaft Servo Frame/Bracket: Small U-shape frame</p> <p>2.43.1. Quantity: Five (5) pieces</p> <p>2.43.2. Frame Type: Small U-shape</p> <p>2.43.3. Material: Hard aluminum plate</p> <p>2.43.4. Material Thickness: 1 mm</p> <p>2.43.5. Size: 43 mm x 27 mm x 23 mm</p> <p>2.43.6. Compatible with all series double-shaft servo</p> <p>3. Warranty</p> <p>3.1. Supplier warrants the item against defects in manufacturing and shipping and delivery issues.</p> <p>3.2. Defective and incorrect items shall be replaced.</p> <p>3.3. At least six (6) months warranty period.</p> <p>4. Payment and Delivery Terms</p> <p>4.1. Price is inclusive of government taxes, delivery fees, and other charges.</p> <p>4.2. Supplier to provide breakdown of prices to be submitted to the DOST-ASTI BAC Secretariat upon submission of price quotations and eligibility requirements.</p> <p>4.3. Items must be delivered to DOST-ASTI Extension Office, Room 409, National Engineering Center – University of the Philippines, Diliman, Quezon City, within forty-five (45) calendar days upon issuance of Notice to Proceed (NTP).</p>				
2	<p>Various Items For Prototype Development</p> <p>1. Objective</p> <p>1.1. DOST-ASTI intends to procure various items for prototype development.</p> <p>1.2. The ABC is inclusive of government taxes and other charges.</p> <p>2. Technical Specifications</p> <p>2.1. USB 3.0 Extension Cable</p> <p>2.1.1. Quantity: Two (2) pieces</p> <p>2.1.2. Type: USB 3.0 Extension Cable Type A Male to Female</p> <p>2.1.3. Cable Length: 3 meters</p> <p>2.1.4. Data Transfer: Up to 5 Gbps high-speed transfer</p> <p>2.1.5. Wire Core: Tinned Copper</p> <p>2.1.6. Connector Material: Gold-plated connector</p> <p>2.1.7. Cable Shielding: Aluminum Foil, Metal Wire Braid, and PVC Jacket</p> <p>2.1.8. Backward compatible with USB 2.0, 1.1, and 1.0</p> <p>2.2. Ball Bearing, 6006 with Rubber Seals</p> <p>2.2.1. Quantity: Two (2) pieces</p> <p>2.2.2. Inside Diameter: 30 mm</p> <p>2.2.3. Outside Diameter: 55 mm</p> <p>2.2.4. Width: 13 mm</p> <p>2.2.5. Ball Bearing Type: Single row deep groove ball bearing</p> <p>2.2.6. End Type: Both sides rubber sealed</p> <p>2.2.7. Bearing Clearance: CN</p> <p>2.2.8. Material: Steel</p> <p>2.2.9. Ball Material: Steel</p>	1	lot	884690.00	884,690.00

- 2.2.10. Cage Material: Sheet metal
- 2.2.11. Static Load Rating: 8.3 kN
- 2.2.12. Dynamic Load Rating: 13.8 kN
- 2.2.13. Limiting Speed: 8,000 r/min

- 2.3. Ball Bearing, 6212 with Rubber Seals
 - 2.3.1. Quantity: Two (2) pieces
 - 2.3.2. Inside Diameter: 60 mm
 - 2.3.3. Outside Diameter: 110 mm
 - 2.3.4. Width: 22 mm
 - 2.3.5. Ball Bearing Type: Single row deep groove ball bearing
 - 2.3.6. End Type: Both sides rubber sealed
 - 2.3.7. Bearing Clearance: CN
 - 2.3.8. Material: Steel
 - 2.3.9. Ball Material: Steel
 - 2.3.10. Cage Material: Sheet metal
 - 2.3.11. Static Load Rating: 36 kN
 - 2.3.12. Dynamic Load Rating: 55.3 kN
 - 2.3.13. Limiting Speed: 4,000 r/min

- 2.4. Thrust Ball Bearing, 53204
 - 2.4.1. Quantity: Two (2) pieces
 - 2.4.2. Inside Diameter: 20 mm
 - 2.4.3. Outside Diameter: 40 mm
 - 2.4.4. Height or Width: 14.7
 - 2.4.5. Height or Width of Bearing including Seat Washer: 17 mm
 - 2.4.6. Radius of Aligning Surface: 36 mm
 - 2.4.7. Ball Bearing Type: Single direction thrust ball bearing with a sphered housing washer
 - 2.4.8. Material: Bearing steel
 - 2.4.9. Cage Material: Sheet metal
 - 2.4.10. Static Load Rating: 37.5 kN
 - 2.4.11. Dynamic Load Rating: 21.2 kN
 - 2.4.12. Limiting Speed: 8,000 r/min

- 2.5. Ball Bearing, 624 with Rubber Seals
 - 2.5.1. Quantity: Six (6) pieces
 - 2.5.2. Inside Diameter: 4 mm
 - 2.5.3. Outside Diameter: 13 mm
 - 2.5.4. Width: 5 mm
 - 2.5.5. Ball Bearing Type: Single row deep groove ball bearing
 - 2.5.6. End Type: Both sides rubber sealed
 - 2.5.7. Bearing Clearance: CN
 - 2.5.8. Material: Steel
 - 2.5.9. Ball Material: Steel
 - 2.5.10. Cage Material: Sheet metal
 - 2.5.11. Static Load Rating: 0.25 kN
 - 2.5.12. Dynamic Load Rating: 0.741 kN
 - 2.5.13. Limiting Speed: 32,000 r/min

- 2.6. Ball Bearing, 625 with Rubber Seals
 - 2.6.1. Quantity: Six (6) pieces
 - 2.6.2. Inside Diameter: 5 mm
 - 2.6.3. Outside Diameter: 16 mm
 - 2.6.4. Width: 5 mm
 - 2.6.5. Ball Bearing Type: Single row deep groove ball bearing
 - 2.6.6. End Type: Both sides rubber sealed

- 2.6.7. Bearing Clearance: CN
- 2.6.8. Material: Steel
- 2.6.9. Ball Material: Steel
- 2.6.10. Cage Material: Sheet metal
- 2.6.11. Static Load Rating: 0.630 kN
- 2.6.12. Dynamic Load Rating: 1.43 kN
- 2.6.13. Limiting Speed: 28,000 r/min

- 2.7. Ball Bearing, 638/4 with Metal Shields
 - 2.7.1. Quantity: Two (2) pieces
 - 2.7.2. Inside Diameter: 4 mm
 - 2.7.3. Outside Diameter: 9 mm
 - 2.7.4. Width: 4 mm
 - 2.7.5. Ball Bearing Type: Single row deep groove ball bearing
 - 2.7.6. End Type: Both sides with metal shield
 - 2.7.7. Static Load Rating: 0.114 kN
 - 2.7.8. Dynamic Load Rating: 0.364 kN
 - 2.7.9. Limiting Speed: 70,000 r/min

- 2.8. Servo Motor LD-260MG
 - 2.8.1. Quantity: Two (2) pieces
 - 2.8.2. Servo Type and Protocol: Double shaft serial bus intelligent servo
 - 2.8.3. Torque: 60 kg strong torque 60 kg.cm 7.4V
 - 2.8.4. Chassis: Metal shell for strong heat dissipation
 - 2.8.5. Size: 65 mm x 30 mm x 61.4 mm
 - 2.8.6. Control Accuracy: 3 μ sec
 - 2.8.7. Working Voltage: 6V - 8.4V
 - 2.8.8. Control Angle: 180°
 - 2.8.9. Wire: 30 cm
 - 2.8.10. Standby Current: 4 mA - 6 mA
 - 2.8.11. No-load Speed: 0.17 sec/60° (6V); 0.15 sec/60° (7.4V); 0.13 sec/60° (8.4V)
 - 2.8.12. Blocking Torque: 58kg-cm (6V); 65kg-cm (7.4V); 70kg-cm (8.4V)
 - 2.8.13. Stalled Current: 3.5A - 6.2A

- 2.9. Servo Motor HTD-45H
 - 2.9.1. Quantity: Five (5) pieces
 - 2.9.2. Connector for Daisy Chaining: Three connectors for clean wiring
 - 2.9.3. Weight: 64g
 - 2.9.4. Dimension: 51.1 mm x 20.14 mm x 40 mm
 - 2.9.5. Working Voltage: 9V-12.6V
 - 2.9.6. Rotation Speed: 0.18 sec/60° (11.1V)
 - 2.9.7. Locked Torque: 45kg.cm (11.1V)
 - 2.9.8. Static Maximum Torque: 45kg.cm (11.1V)
 - 2.9.9. Rotation Range: 0°-240°
 - 2.9.10. No-load Current: 100 mA
 - 2.9.11. Stall Current: 3A
 - 2.9.12. Servo Accuracy: 0.2°
 - 2.9.13. Controllable Angle Range: 0~1000, corresponding to 0~240°
 - 2.9.14. Control Method: UART serial command
 - 2.9.15. Communication Baud Rate: 115200
 - 2.9.16. Storage: Save data when power off
 - 2.9.17. Servo ID: Can be set to 0~253, 1 by default
 - 2.9.18. Angle Read Back Function: Support
 - 2.9.19. Protection: Avoid stalling and overheat
 - 2.9.20. Date Feedback: Temperature, voltage,

position

- 2.9.21. Working Mode: Servo mode and gear motor mode
- 2.9.22. Gear Type: Metal gear
- 2.9.23. Servo Wire Length: 20 cm
- 2.9.24. Connector: PH2.0-3P
- 2.9.25. Applicability: Joints of bionic robots

- 2.10. DC-DC Converter
 - 2.10.1. Quantity: Five (5) pieces
 - 2.10.2. Voltage Range: Converts 7.5V~30V input to an output of 3.3V/5V/9V/12V with suitable heat dissipation
 - 2.10.3. Thermal Protection: 70 °C over-temperature and overload protections
 - 2.10.4. Input Voltage: 7.5V~30V
 - 2.10.5. Rated Output Parameters
 - 2.10.5.1. 3.3V/0~3A 5V/0~3A
 - 2.10.5.2. 9V/0~2.5A 12V/0~3A
 - 2.10.6. Maximum Output Parameters
 - 2.10.6.1. 3.3V/5A (16.5W) 5V/5A (25W)
 - 2.10.6.2. 9V/3.5A (31.5W) 12V/3.5A (42W)
 - 2.10.7. Low Ripple: 30 mV
 - 2.10.8. Soldering Hole Pitch: 2.54mm (can solder pin headers)
 - 2.10.9. Dimension (L x W): 2.7 cm x 2 cm / 1.06 in x 0.79 in

- 2.11. DC-DC Buck Boost Converter Module (5A)
 - 2.11.1. Quantity: Two (2) pieces
 - 2.11.2. Input Voltage (DC): 6-35V
 - 2.11.3. Output Voltage (DC): 1.0-33V
 - 2.11.4. Constant Current Adjustment Range: 0.05A-5A
 - 2.11.5. Conversion Efficiency: 90%
 - 2.11.6. Maximum Input Current: 7A
 - 2.11.7. Maximum Output Current: 5A
 - 2.11.8. Module Size (LWH): 70 mm x 39 mm x 32 mm / 2.76 in x 1.54 in x 1.26 in

- 2.12. 120W DC-DC Converter 12V@10A
 - 2.12.1. Quantity: Two (2) pieces
 - 2.12.2. Input Range: 15-40V DC
 - 2.12.3. Output: 12V DC
 - 2.12.4. Output Current: 10A
 - 2.12.5. Size: 74 mm x 74 mm x 32 mm (2.91 in x 2.91 in x 1.26 in)
 - 2.12.6. Efficiency: 90 %
 - 2.12.7. Weight: 0.28 kg
 - 2.12.8. Maximum working temperature: 80 °C
 - 2.12.9. Features: Overvoltage protection, Overcurrent protection, Overheat protection, Short circuit protection, Waterproof and shockproof case,
 - 2.12.10. High efficiency and less heat

- 2.13. SSD Storage - 2TB
 - 2.13.1. Quantity: One (1) piece
 - 2.13.2. Product Type: NVMe SSD
 - 2.13.3. Storage Capacity: Up to 2TB
 - 2.13.4. Interface: PCIe Gen 3.0 x4, NVMe 1.3
 - 2.13.5. Form Factor: M.2 (2280)

- 2.13.6. Dimensions (W x H x D): 80.15 mm x 22.15 mm x 2.38 mm
- 2.13.7. Weight: Maximum 8.0 g
- 2.13.8. Sequential Read Speed: Up to 3,500MB/s
- 2.13.9. Sequential Write Speed: Up to 3,300MB/s
- 2.13.10. Random Read (4KB, QD32): Up to 600,000 IOPS Random Read
- 2.13.11. With reliability of up to 1,200 TBW
- 2.13.12. Nickel-coated controller and heat spreader for heat dissipation

2.14. Depth Camera

- 2.14.1. Quantity: One (1) piece
- 2.14.2. Genuine product only
- 2.14.3. Environment: Indoor/Outdoor
- 2.14.4. Image Sensor Technology: Global Shutter
- 2.14.5. Ideal Range: .6 m to 6 m
- 2.14.6. Depth Technology: Stereoscopic
- 2.14.7. Minimum Depth Distance (Min-Z) at Max Resolution: ~52 cm
- 2.14.8. Depth Accuracy: <2% at 4 m
- 2.14.9. Depth Field of View (FOV): 87° × 58°
- 2.14.10. Depth Stream Output Resolution: Up to 1280 × 720
- 2.14.11. Depth Stream Output Frame Rate: Up to 90 fps
- 2.14.12. RGB Frame Resolution: 1280 × 800
- 2.14.13. RGB Frame Rate: 30 fps
- 2.14.14. RGB Sensor Technology: Global Shutter
- 2.14.15. RGB Sensor FOV: 90° × 65°
- 2.14.16. RGB Sensor Resolution: 1 MP
- 2.14.17. Form factor: Camera Peripheral
- 2.14.18. Camera Dimension (Length × Height × Depth): Approximately 124 mm × 29 mm × 36 mm
- 2.14.19. Connectors: GMSL/FAKRA
- 2.14.20. Mounting Mechanism
 - 2.14.20.1. One 1/4-20 UNC thread mounting point
 - 2.14.20.2. Two M4 thread mounting points
 - 2.14.20.3. Tripod

2.15. Multispectral Camera

- 2.15.1. Quantity: One (1) piece
- 2.15.2. Weight: Approximately 363 g / 12.8 oz. (multispectral camera and accessories)
- 2.15.3. External Power: 7.0 V - 25.2 V
- 2.15.4. Power Input: 5.5 / 7.0 / 10W (standby, average, peak)
- 2.15.5. Sensor Resolution: 1456 x 1088 (1.6 MP per MS band), 2464 x 2056 (5.1 MP panchromatic band)
- 2.15.6. Spectral Bands
 - 2.15.6.1. Blue (475nm ±32nm)
 - 2.15.6.2. Green (560nm ±27nm)
 - 2.15.6.3. Red (668nm ±14nm)
 - 2.15.6.4. Red Edge (717nm ±12nm)
 - 2.15.6.5. NIR (842nm ±57nm)
- 2.15.7. RGB Color Output: at least 5.1 MP (global shutter, aligned with all bands)
- 2.15.8. 2.3.7. Capture Rate: Up to 3 captures per second raw DNG
- 2.15.9. Multispec GSD (Per Multispec Band): 7.7 cm per pixel at 120m / 3 in per pixel at 400 ft

- 2.15.10. Panchro and Pansharpened GSD: 3.98 cm per pixel at 120m / 1.56 in per pixel at 400 ft
- 2.15.11. Interfaces
 - 2.15.11.1. 3 Configurable GPIO: Select from trigger input, PPS input, PPS output, and top of frame signals
 - 2.15.11.2. Host virtual button
 - 2.15.11.3. USB 2.0 port for WiFi
 - 2.15.11.4. Serial
 - 2.15.11.5. 10/100/1000 ethernet
 - 2.15.11.6. CF express for storage
- 2.15.12. Field of View: 50° HFOV x 38° VFOV (MS), 44° HFOV x 38° VFOV (PAN)
- 2.15.13. Items included
 - 2.15.13.1. Multispectral camera sensor
 - 2.15.13.2. Downwelling Light Sensor (DLS) 2 with embedded GPS
 - 2.15.13.3. Calibrated Reflectance Panel (CRP) 2
 - 2.15.13.4. USB Wi-Fi dongle
 - 2.15.13.5. Lens cover
 - 2.15.13.6. Integration cables
 - 2.15.13.7. Assorted mounting hardware
 - 2.15.13.8. CFexpress card
 - 2.15.13.9. CFexpress card reader
 - 2.15.13.10. Hard carrying case
 - 2.15.13.11. Start guide

3. Warranty

- 3.1. Supplier warrants the item against defects in manufacturing and shipping and delivery issues.
- 3.2. Defective and incorrect items shall be replaced.
- 3.3. Warranty Period
 - 3.3.1. At least six (6) months for 2.1. to 2.14.
 - 3.3.2. At least one (1) year for 2.15.

4. Payment and Delivery Terms

- 4.1. Price is inclusive of government taxes, delivery fees, and other charges.
- 4.2. Supplier to provide breakdown of prices to be submitted to the DOST-ASTI BAC Secretariat upon submission of price quotations and eligibility requirements.
- 4.3. Items must be delivered to DOST-ASTI Extension Office, Room 409, National Engineering Center – University of the Philippines, Diliman, Quezon City within forty-five (45) calendar days upon issuance of NTP.

TOTAL APPROVED BUDGET FOR THE CONTRACT (ABC):

Php 1,078,120.00

RESERVATION CLAUSE

The Advanced Science and Technology Institute reserves the right to accept or reject any proposal, to annul the bidding process, and to reject all proposals at any time prior to contract award, without thereby incurring any liability to the affected proponent or proponents.