



**BSWM- BIDS AND AWARDS COMMITTEE**  
**SUPPLEMENTAL BID BULLETIN NO. 2**

**CONTRACT: PROCUREMENT OF 1 UNIT OF MOBILE SOIL LABORATORY**  
**(UNDER GAA 2023) FOR CY 2024- IB NO: BSWM-2024-02-**  
**0027**

This Addendum is being issued in accordance with Section 22.5.2 of the IRR of RA 9184, to clarify and modify some provisions of the Bidding Document. **THIS SHALL FORM AN INTEGRAL PART OF THE BID DOCUMENT.** Likewise, the succeeding agreements and reminders were discussed during the Second Pre-Bid Conference held last March 26, 2024 at the BSWM Function Hall and via Videoconferencing-Zoom.

**AMENDMENTS OF THE BIDDING DOCUMENT: FINAL SECTION VII. TECHNICAL SPECIFICATION**

**Section VII. Revised Technical Specifications**

Item	Specification	Statement of Compliance
<i>[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.]</i>		

	Supply, Delivery, Modification of vehicle and Installation of equipment for Mobile Soils Laboratory	Qty	Statement of Compliance
	Component I. Commissioning and modification of vehicle to house the required instruments, equipment, and other accessories.	1	
1	A) Vehicle Specifications:		
	10-wheeler truck, air-conditioned		
	Max output: not less than 2,400 rpm		
	Fuel Type: Diesel		
	Max Torque: not less than 882 N-m (Newton-meter)		
	Overall Length : minimum 11,900 mm		
	Gross Payload: minimum 18,995 kg, inclusive of trailer		
	Tire: 11R22.5-16PR		

	Engine: 6 Cylinder, In-line, Common-Rail Direct Injection, Blue Power Diesel Engine		
	Rear Body Length: minimum 9,754 mm		
	Inclusive of spare tires (at least 4 pcs) and early warning device		
	Inclusive of vehicle specification plate, engraved		
	With reverse warning buzzer, auto door lock, air break		
	Inclusive of Tools for repair:		
	Toolbox, crescent wrenches, vehicle jack, combination wrenches, pliers, vice grips, wire cutter and electrical tape, ratcheting screwdriver set, 3-lb sledgehammer, tire air pressure gauge, flashlights, metal dowel rod, truck trip inspection tool, safety glasses, gloves, crowbar, fuses		
	B) Customization specifications:		
	provision and installation of furnitures, fixtures, and other accessories		
	electrical works, inclusive of convenience outlet, lighting		
	Provision for sample storage cabinet, stainless steel, laminated		
	Office and ICT equipment:		
	Office table (2)- furniture to add anti-vibration mechanisms /foam cushion capable of withstanding vibration during travel		
	chairs (4)- leather, ergonomic, with seatbelt, embedded / detachable to mobile vehicle		
	Stool (2) - stainless, leather cushion		
	Laboratory Housing Specifications:		
	Length: minimum 32.80 ft / 10000 mm		
	Width: minimum 6.56 ft / 2000 mm		
	Height: minimum 6.56 ft / 2000 mm		
	Three (3) main sections each with partition:		
	1) Soil and Water Analysis Section		
	2) Soil Physical Analysis Section		
	3) Soil Microbiological Analysis Section		
	Dimensions per room based on final layout		
	Separated door for Soil Micro Area, requires partition		
	Sample Preparation Area Outside the Laboratory with the following inclusions:		
	10 foldable & collapsible chairs		
	removable/retractable awning or canopy, UV-resistant, waterproof fabric		
	customized size to cover the desired presentation area		
	frame: aluminum or steel		
	mounting: attached securely to the mobile laboratory structure		
	legs or pillars: adjustable for varying terrains and stability		
	with side curtains or screens for additional shade		

	list of fixtures and equipment per section and per unit of Mobile Soil Laboratory is listed below		
	Laboratory fixtures:		
	Standard Laboratory Sink, Stainless steel	3	
	Water Tank, 300 - 500 Liters, stainless steel	1	
	Water suction line with water purifier (connection with tap water with pre-filter 3 stages)	1	
	Waste Water Reservoir- 70 L, Either Polytetrafluoroethylene (PTFE) or Polyether ether ketone (PEEK)	1	
	(30 L) Hazardous Waste Storage Containers for acidic, alkaline waste, and metal containing waste solutions	3	
	Windows, awning, aluminum frame with glass	3	
	doors	2	
	-side door (1 swing)		
	-rear door (2 swing)		
	provision of collapsible stairs and ramp		
	Exhaust fan	2	
	Stainless or Vinyl Flooring, with anti-slippage mechanism		
	Lockable overhead cabinets on either sides, with shelves	6	
	Laboratory tables, chemical resistant tabletop, with drawers and cabinets, anti-vibration mechanisms /foam cushion capable of withstanding vibration during travel	6	
	Aircon (minimum 1 HP up to 2HP) split type	2	
	Aluminum composite 3mm - outside and Inside wall , Wall insulation (2") chemical and thermal resistant (lot)	1	
	Provision of Emergency Shower, Eye Wash, Spill Kits and First Aid Kits	1	
	C) Standard inclusions and accessories:		
	truck stabilizer leg (4-legs) with a capacity of at least 2-4 tonnes per leg - Manual (hydraulic)	1	
	Rear and front Camera with storage memory card	2	
	(min of 512 GB)		
	CCTV Surveillance System	1	
	Monitors entrances, exits, and laboratory area;		
	At least 2 units of camera, true IP 66 camera, 1080p or higher resolution, 15 frames per second or greater;		
	Includes centralized recording solution with Video Management Software and Network Video Recorder		
	structured cabling for intranet and internet		
	Scope of work includes installation, testing, and maintenance of CCTV system		
	Implement a real-time GPS monitoring system to track the location of the Mobile Soils Laboratory at all times. The GPS system should provide accurate location data even without internet, geo-fencing capabilities, and capable of generating alerts in case of unauthorized movements, with provision of subscription for GPS System for minimum of 5years.		
	Enhance Personnel Access Control by integrating biometric authentication for staff operating the Mobile Soils Laboratory. The biometric system should support fingerprint or other secure biometric modalities (key card), ensuring only authorized personnel can access the laboratory		

	The system should also include motion sensors, door, window sensors, and central monitoring unit capable of triggering immediate alerts to authorized personnel in the event of security breach		
	Wireless Prepaid Wifi Router	2	
	2.4 & 5.0 Ghz dual band Wifi- Network Type: 3G and 4G LAN port : 4 LAN port		
	With 2 Antenna for stable data transmission No installation, just plug and surf		
	Connect up to 10 devices		
	CO2 Fire extinguisher	3	
	Specification:		
	Classification: C		
	Approximate Weight - 5 lb.		
	Dry Chemical Fire Extinguisher	3	
	Specification:		
	Classification: 40B:C		
	Approximate Weight - 5 lb.		
	Power Source:		
	1. Generator - 6-8 kVA, diesel engine		
	movable, can be pulled-out during operation and isolate from main body to avoid vibration on sensitive equipment		
	Efficiency - ~80% or more		
	2. AC (Alternating Current) Power Source - 220-240V, 60Hz		
	3. Solar Panel (alternative power source) at least 6 - 8 KVA (8 -14Panels, balanced weight distribution), Hybrid System		
	Battery Type: Lithium-ion or Lead-Acid (Deep-Cycle)		
	Battery Inverter/Charger Capacity: 6 - 8 kVA		
	Efficiency: Typically 80% or higher		
	with Battery Management System (BMS)		
	includes circuit breakers or fuses for protection		
	with Battery Disconnect Switch Transfer Switch Electrical Distribution System		
	Registration of LTO (to be registered as government vehicle) and insurance (3 years) inclusive of the following:		
	Commercial invoice or original sales invoice from the country of origin		
	Original/Photocopy of the following:		
	Sales invoice of body		
	Appropriate COC (Certificate of Coverage)		
	Certified True Copy of DTI-BIS endorsement		
	CSR for engine and chassis		
	PNP-HPG MV Clearance Certificate		
	MVIR (Motor Vehicle Inspection Report)		
	CCES (Certificate of Compliance to Emission Standard)		
	customization of label, design and finish of the mobile soils laboratory according to the DA Branding/ BSWM- NSHP Branding (to be provided by the End-User during contract implementation)		

	D) After sales services specifications:		
	with minimum (2) years warranty on parts and services of the vehicle		
	with end-users training and handbook on operation and maintenance of the vehicle		
2	Component II. Provision of laboratory instruments and technical and scientific equipment		
	Laboratory Equipment List:	Qty	
	A) Soil and Water Analysis		
	<b>pH Meter (Refillable)</b>	2	
	Specifications:		
	pH Range: 0 to 14.00 pH or better		
	No. of calibration points: at least 3		
	Accuracy: $\pm 0.002$ pH		
	With temperature compensation: ATC / MTC		
	Integral Electrode Holder & 100/240 VAC Adapter		
	Power Requirements: As per manufacturer specifications		
	Has the ff accessories: 5 pcs pH Electrodes (Refillable), ATC probe		
	With (5 pcs, 500 mL each) pH 4,7, 10 NIST Traceable Buffer Standards		
	With 2 pcs pH electrode refill solution (50 mL)		
	<b>Conductivity Meter</b>	2	
	Specifications:		
	Range: 0.000 $\mu$ S to 1000.0 mS		
	Accuracy: $\pm 1$ % full scale		
	Resolution: 0.01 $\mu$ S/cm - 0.1 $\mu$ S/cm, depending on measuring range		
	Compensation: ATC / MTC		
	Power Requirements: As per manufacturer specifications		
	Power Requirements: 220-240 V, 60Hz		
	With NIST Traceable Conductivity Standard Solution, 5 pcs, 147 & 1413 $\mu$ S/cm, KCl, 125mL		
	<b>Reciprocating Shaker</b>	1	
	Specifications:		
	Operating Speed: Variable speed 60 – 260 osc / min or RPM		
	Stroke: 1"-1.5" Horizontal		
	Timer: 1 min - minimum 6 h		
	Type of mounting: Benchtop, Suction cup feet to prevent creeping		
	Payload: min 20 kg		
	Includes: Utility box carrier with anti-slide surface and one (1) rubber coated crossbar is available to hold various combinations of beakers, flasks, etc		
	Power Requirements: 220-240 V, 60Hz		
	<b>UV-Vis Spectrophotometer w/ laptop and printer</b>	1	
	Specifications:		

	Photometric System – Double beam		
	Monochromator – Double monochromator / Monochromator with imaging grating and aspheric quartz coated optics		
	Source – Xe / Halogen (Tungsten) - D2 Lamp		
	Wavelength Range – 190-1100 nm		
	Detectors – Silicon photodiode detectors for simultaneous measurement of all channels		
	Wavelength accuracy (nm) $\pm 0.2$		
	Wavelength reproducibility (nm) $< 0.025$		
	Limiting Resolution – 0.02 nm - 0.1 nm		
	Spectral bandwidth 0.1 to 5 nm at 0.01 nm		
	Data collection rate 250 data points per second		
	<b>Simultaneous measurement on different channels</b>		
	With laptop, Unit with sipper (5 spare tubings ), 5 extra quartz cuvettes, 3 extra lamp source (if source is Halogen (Tungsten) - D2 Lamp) printer, UV workstation software compatible with equipment, and complete genuine office and OS		
	Interchangeable between sipper and cuvette type		
	With 5 pcs, 1000 ppm NIST Traceable Phosphorus Standard Solution corresponding (1) 500 mL / bottle & 5 pcs Sucrose Standard, NIST Traceable with Certificate of Analysis, 100g/bottle		
	With included laboratory supplies:		
	160 pcs, Borosilicate test tubes 10 ml test tube and corresponding		
	4 pcs 40 placer test tube rack (PET)		
	Power Requirements: 220-240 V, 60Hz		
	Laptop specifications:	1	
	Laptop		
	-		
	Processor: i7-12th Gen / R7 Zen3+(RDNA2 based) subject to change considering software compatibility		
	Storage: at least 500GB M.2 PCIe NVMe SSD		
	Memory: at least 16GB, DDR4 (upgradable)		
	Camera: at least 720p		
	Screen size: at least 15.6-inch		
	Display Type: IPS		
	Battery Life: at least 50WH		
	Operating System: Windows 10/11 Pro subject to change considering software compatibility		
	MS Office: Microsoft Office 2021 (license)		
	Printer specifications:	1	
	Can print up to Legal size (8.5 x 14 in), color, black		
	Can copy and scan up to A4 size, color, black		
	Has wireless capability		
	Has mobile printing capability		
	Print speed: Black - up to 8 ppm; Color - up to 5 ppm		

	Print quality: Black - up to 1200 x 1200 dpi; Color - up to 4800 x 1200 dpi		
	Copy speed: Black - up to 5 cpm; Color - up to 3 cpm		
	Copy resolution: up to 300 x 300 dpi		
	Scan resolution: up to 1200 dpi		
	Paper handling: Input - up to 60 sheets; Output - up to 25 sheets		
	Connectivity: Hi-speed USB; Built-in WiFi 802.11 b/g/n		
	200 - 240 VAC"		
	Single Channel Pipetors Set	1	
	Specifications:		
	Chemically resistant, Fully Autoclavable		
	Volume Adjustable, interchangeable, easy-grip ejector		
	with carousel, 1000 pipette tips per unit		
	Volumes:		
	1000-10,000 µl		
	500-5000 µl		
	100-1000 µl		
	10-100 µl		
	<b>Bottle Top Dispenser (100 mL)</b>	1	
	Specifications:		
	Capacity: 10-100 mL		
	<b>Subdivision: min of 1.0 mL</b>		
	with container bottle (2.5 L) and adapters		
	with recirculation and discharge valve		
	<b>Bottle Top Dispenser (50 mL)</b>	2	
	Specifications:		
	<b>Capacity: 5-50 mL</b>		
	<b>Subdivision: min of 1.0 mL</b>		
	with container bottle (2.5 L) and adapters		
	with recirculation and discharge valve		
	<b>Centrifuge</b>	1	
	Specifications:		
	Timer range: Up to 9 hr 59 min or continuous		
	Electrical Requirements: 100-240V, 50/60Hz, Max 850 W		
	RPM (Revolutions): Up to 15200		
	Max Rcf, :minimum 3260 x g		
	Tube Sizes (Rotors Offered): 100 mL		
	<b>Rotor capacity: (4-8) x 100 mL tubes &amp; 8-16 x 50 mL tubes</b>		
	Horizontal (Rotors Available): 2		
	With centrifuge tube: 100 mL (30 pcs) & 50 mL (30 pcs)		
	Program Storage: minimum 6 programs		
	<b>Display: Large, brightly lit LED/ LCD display</b>		
	Safety Features: Lid lock, steel armored ring, view port for speed calibration, lid		

	emergency release or its equivalent		
	<b>Block Digester with Scrubber</b>	1	
	<b>Sample positions: 20-45 pcs (100 mL)</b>		
	<b>Maximum Temperature (in °C): 400-450</b>		
	Digestion vessel size (in ml): 100		
	Maximum Power consumption (in W): maximum 2300		
	Non-corrosive casing		
	With digestion programs (minimum 25) with auto lift feature		
	Timer range: Up to 999 min		
	Heater Indication and Warning: LED or LCD Display		
	Accessories:		
	Round bottom digestion vessel, 100 ml for micro-Kjeldahl, 40 pcs;		
	Kjeldahl Neutralizer (extraction system/scrubber)		
	1000 pcs Kjeldahl Catalyst Tablets (Contains 1g Na <sub>2</sub> SO <sub>4</sub> And Equivalent Of 0.1g CuSO <sub>4</sub> per tablet)		
	<b>Nitrogen Distillation Unit</b>	1	
	Specifications:		
	<b>Measuring range: 0.1-200 to 250 mg nitrogen</b>		
	Recovery is greater than 99.5% at Nitrogen (N) levels between 1 and 250mg		
	Reproducibility: 1% RSD (with the digestion step)		
	Distillation time: 3-4 min at 30mg N (6.5 min at 200mg N)		
	Distillation capacity: approx 40mL/min		
	Self-adjusting cooling water control		
	Waste, Water, and Alkali Reservoir		
	With Voltage Regulator		
	Power Requirements: 200-240 V, 50-60Hz		
	With included laboratory supplies:		
	40 pcs (100 mL) digestion and distillation vessel		
	<b>40 pcs 125 mL, Borosilicate type Erlenmeyer Flask</b>		
	2 pcs 10 ml volumetric pipette		
	2 pcs Tris(hydroxymethyl)aminomethane (THAM), NIST Traceable with Certificate of Analysis, ≥99% Powder, 100g/bottle		
	2 pcs L-lysine Monohydrochloride, NIST Traceable with Certificate of Analysis AR, 100g/bottle		
	<b>Atomic Absorption Spectroscopy with Laptop</b>	1	
	Wavelength range: 185.0 to 900.0 nm		
	Monochromator: Aberration-corrected Czerny-Turner mounting, Number of grating grooves: 1600-1800 lines / mm, Focal length: <b>Less than or equal to 330 mm</b>		
	Detector: Photomultiplier tube / Solid State Detector		
	Optics: Optical double-beam		
	Background correction method: BGC-D2 (D2 Hollow Cathode lamp method) (185.0 to 430.0 nm)		
	Number of turret: at least 8		

	Lamp mode: EMISSION, NON-BGC, BGC-D2		
	Measurement mode: Flame continuous method, flame emission method, flame absorption method		
	Simultaneous or sequential determination on multiple wavelengths		
	Standard Accessories:		
	Autosampler - at least 50 samples w/ Sampling Kit		
	<b>Compressor - Silent Type (if applicable)</b>		
	Nebulizer setup		
	Fume Hood / Canopy Hood		
	Laptop		
	Instrument Grade with Acetylene Gas with tank (3) with Gas Cage		
	Deuterium Lamp - 3 pcs		
	Hallow Cathode Lamp (2 per element) : Na, Ca, Mg, K, Fe, Cu, Mn, Zn		
	AAS Standard Solution corresponding to HCL : 500 mL / bottle		
	With included laboratory supplies:		
	160 pcs, Borosilicate test tubes 10 ml test tube and corresponding		
	4 pcs 40 placer test tube rack (PET)		
	3 pcs each, 50 mL, 100 ml, and 250 mL Borosilicate Beaker		
	5000 mL, PET beaker with handle		
	50 pcs 50 mL, Borosilicate type volumetric flask		
	10 pcs 50 mL, Borosilicate type volumetric flask		
	50 pcs PET Funnel (Dia: 80 mm, Stem Dia: 8 mm, Stem Length 140 mm)		
	5 pcs Filter Paper #42 or equivalent, 125mm dia, ashless 100circles/box		
	<b>With End-User training ( No. of pax: At least 2 pax) using the same brand and model of the offered equipment conducted by Authorized Representative/s of the Manufacturer with venue at manufacturer's training facility</b>		
	Power Requirements: 220-240 V, 60Hz		
	Laptop specifications:		
	Laptop		
	-		
	Processor: i7-12th Gen / R7 Zen3+(RDNA2 based) subject to change considering software compatibility		
	Storage: at least 500GB M.2 PCIe NVMe SSD		
	Memory: at least 16GB, DDR4 (upgradable)		
	Camera: at least 720p		
	Screen size: at least 15.6-inch		
	Display Type: IPS		
	Battery Life: at least 50WH		

	Operating System: Windows 10/11 Pro subject to change considering software compatibility		
	MS Office: Microsoft Office 2021 (license)		
	<b>X-Ray Fluorescence Spectrometer</b>	1	
	X-Ray Fluorescence Spectrometer (Benchtop)		
	Benchtop housing, control unit with electronics, HV generator		
	<b>Dimensions (HxWxD): 290-360 mm × 460-600mm × 440-590 mm</b>		
	<b>Weight: Max 50 kg</b>		
	Power consumption: Maximum 180W		
	<b>Automatic with cassette for up to 10-25 samples</b>		
	<b>Liquids &amp; suspensions from 1µL to 50µL</b>		
	Micro-focus, air cooled, 50kV 1mA (50W) tube with Mo target / W target		
	<b>Silicon drift detector, With Liquid Nitrogen Free Cooling Method, Surface area = 60mm<sup>2</sup></b>		
	<b>&lt;149eV energy resolution at 100kcps (Mn Kα)</b>		
	<b>USB-A, USB-C, or RS232</b> for data exchange and sample changer		
	Standard Accessories		
	Set of 25 quartz discs		
	At least <b>300</b> disposable sample discs, diameter is 30 mm		
	Sample cassette for 25 discs		
	Washing cassette		
	Set of 25 sample containers for 1 disc		
	Tool for sample centering		
	<b>With End-User training ( No. of pax: At least 2 pax) using the same brand and model of the offered equipment conducted by Authorized Representative/s of the Manufacturer with venue at manufacturer's training facility</b>		
	<b>Ultrapure water generator</b>	1	
	Produces both ASTM Type 1 (0.055 uS/cm)		
	Water Purification System, to be attached to Water Tank (300 - 500 L) and Reservoir tank (30 mL)		
	<b>RO Flow Rate: 30-60 L /hr</b>		
	Standard Accessories:		
	main system unit / production station		
	50 L reservoir with recirculation pump, CO2 vent filter and sterile overflow		
	wall bracket accessory		
	Pretreatment system with cartridge		
	RO / pretreatment cartridge		
	reverse osmosis cartridge		
	polishing DI cartridge		
	inline ultrafilter		
	Additional Accessories (either as standalone or combined):		
	0.1 m polysulfone membrane filter		

	2 pcs - 1 um prefilter		
	2 pcs - hardness stabilizer		
	2 pcs - carbon cartridge		
	2 pcs - RO cartridge		
	2 pcs - Ultrapure cartridge		
	2 pcs - sterile, maximum 0.2 um filter for system		
	2 pcs - CO2 Vent filter		
	Pretreatment and other cartridges easy to change based on system alert with a twist and lock design		
	Automatic RO rinsing to reduce risk of contamination		
	UV lamp does not require replacement		
	With built in indicators for water quality through color coded LED icons, physical buttons or actual EC readings		
	With production station and ergonomic 3.5 L Polycarbonate airtight detachable tank with an option for larger capacity 50 L tank		
	Ultrapure water generated compliant with global standards		
	<b>Digital Titrator</b>	2	
	Specifications:		
	Nominal Volume: 50 mL		
	Accuracy in % ( $\pm$ ): 0.2%		
	Coefficient of variation (%): 0.1 %		
	Accessories:		
	telescoping filling tube		
	recirculation tube		
	Minimum 2 batteries		
	3 PP bottle adapters (GL 45/32, GL 45/S 40, GL 32/NS 29/32)		
	2.5 L amber bottle		
	Power Requirements: 220-240 V, 60Hz		
	<b>Fume Hood, Ducted</b>	1	
	Specifications:		
	Maximum of 1250 mm in width (Overall Size); Work Surface Height: 750mm - 1000mm		
	Air Velocity: 0.3~0.8m/s		
	1 unit LED Lamp, minimum 10 W		
	Blower: Built-in centrifugal blower or equivalent, speed adjustable		
	Front Window: Acrylic window; Manual; Reversal design		
	With monitoring display for flow rate		
	Power Requirements: 220-240 V, 60Hz		
	<b>Cross beater mill</b>	1	
	Specifications:		
	Materials of the grinding tools: hardened steel		
	Min. sample quantity: 40 - 50 ml		
	Max. throughput: approx. 80 L/h		
	Rotor speed: minimum 4,000 rpm		

	Electrical Details: 200-240 V/1~, 50/60 Hz, 1500 Watt		
	Prevents cross contamination, with sieve inlets for >/ = 2mm samples & 0.5 mm samples		
	Standard Accessories:		
	"Bottom sieves made of stainless steel 316L		
	0.5 mm trapezoidal perforation"		
	2 mm trapezoidal perforation		
	universal support stand		
	silent type vacuum cleaner with complete tubings for easy clean up of the unit		
	<b>With End-User training (No. of pax: At least 2 pax) using the same brand and model of the offered equipment conducted by Authorized Representative/s of the Manufacturer with venue at manufacturer's training facility</b>		
	<b>Dehumidifier</b>	2	
	Specifications:		
	Extract approx. 20-25L of water per day to maintain humidity below 50%		
	Water Tank Volume: minimum 10L		
	Power Requirements: 220-240 V, 60Hz		
	With calibrated thermohygrometer		
	<b>Laboratory Refrigerator (General Use)</b>	1	
	Specifications:		
	Temperature Range: 2~8°C		
	Capacity: Maximum 200 L		
	Refrigerant: CFC free - R744 / R290 / R134a / R600a optional		
	<b>No frost/Frost-free (does not require manual defrosting)</b>		
	Cooling Type: Forced air cooling/ Normal convection		
	<b>Power: max of 135 W; Power Supply: 220V, 50/60Hz</b>		
	<b>Magnetic Stirrer/Hot Plate (Dual)</b>	1	
	Specifications:		
	Speed range: 60 - 1500 rpm		
	Temperature setting range: Ambient - minimum of 350°C		
	Heat and stirring control: Turning knob		
	Power Requirements: 220-240 V, 60Hz		
	<b>Top Loading Balance</b>	1	
	Specifications:		
	Capacity: Minimum 610g		
	Readability : 0.01g		
	Repeatability: Maximum 0.02 g		
	Linearity: Maximum 0.03 g		
	Power requirement: AC adaptor ( DC12V, 1A )		
	Power Requirements: 220-240 V, 60Hz		
	<b>Vortex Mixer</b>	2	
	Specifications:		

	Construction material: zinc alloy and technopolymer or equivalent		
	Support system: 4 anti-sliding feet or equivalent		
	Orbital diameter: Maximum 4.5 mm		
	Speed: up to 3000 rpm		
	Operating modes: touch, continuous		
	Power Requirements: 220-240 V, 60Hz		
	<b>Analytical Balance</b>	1	
	Specifications:		
	Capacity: 220 g		
	Readability: 0.0001g		
	Repeatability: 0.0001 g		
	Linearity: 0.0002g		
	Power Requirements: 220-240 V, 60Hz		
	With internal calibration function		
	Electrical requirement: 230V, 60 Hz		
	With the following laboratory supplies:		
	10 packs weighing boat, 100 pcs / packWeighing Boat		
	10 pcs Laboratory spoon/spatula		
	B) Soil Physical		
	<b>Automated Saturated Hydraulic Conductivity System (2 station) with 1 Laptop</b>	1	
	Specifications:		
	Applicable methods: Constant Head and Falling Head		
	Sample Ring Volume: 98.2-100 mL		
	<b>Sample Ring Inside Cross-Sectional Area: 19-21 cm2</b>		
	Reservoir Volume: 930-1000 mL		
	Pressure Transducer Range: -100 kPa to +100 kPa		
	Pressure Precision Transducer comes w/ Micro USB cable, Analog Ribbon Connector Cable, Software Flash Drive, Instruction Manual		
	Software Application: can control up to 20 independent units simultaneously.		
	provision for main water reservoir ( min capacity: 10L ) with accessories		
	Power Requirements: 220-240 V, 60Hz		
	Inclusive of Laptop computer		
	Laptop		
	-		
	Processor: i7-12th Gen / R7 Zen3+(RDNA2 based) subject to change considering software compatibility		
	Storage: at least 500GB M.2 PCIe NVMe SSD		
	Memory: at least 16GB, DDR4 (upgradable)		
	Camera: at least 720p		
	Screen size: at least 15.6-inch		
	Display Type: IPS		
	Battery Life: at least 50WH		

	Operating System: Windows 10/11 Pro subject to change considering software compatibility		
	MS Office: Microsoft Office 2021 (license)		
	<b>With End-User training ( No. of pax: At least 2 pax) using the same brand and model of the offered equipment conducted by Authorized Representative/s of the Manufacturer with venue at manufacturer's training facility</b>		
	<b>Particle Size Analysis System</b>	1	
	Includes:		
	5pcs Sedimentation Glass Cylinder, 1L		
	2 pcs Sodium Hexametaphosphate, AR Grade, 500g		
	5 pcs Plastic Pestle		
	1 pc Portable Blender		
	1pc folding jug; minimum capacity 2.5 Gal.		
	Stokes Kit:		
	Sieve Set with shaker kit		
	Sieve Set :10, 20, 40, 60, 120 and 200		
	Sieve Diameter: 3-4 inches		
	inclusions: 5 pcs Beaker, yorker spout, drying pans, spatula, timer, spoon and gloves		
	Soil Sampler Set with Sampling tube	1	
	Specifications:		
	Soil Sampler - 2 sets for the following:		
	Soil Sample Shoe		
	Handle with beating head		
	Hammer with nylon		
	Brush and knife set		
	Case (plastic)		
	17 sets Sampling tube (100ml)		
	Dimensions: I.D.diam.50 x 51mm		
	Material: Stainless steel 304		
	Quantity: 6 pcs. with 2 lids in a cloth case per set		
	2 pcs Shovel		
	Tip: Round Shape		
	Material: Stainless steel		
	weight: ≤220 grams		
	Accessories: Waist band leather case		
	<b>Munsell Soil Color Chart</b>	2	
	Specifications:		
	10R, 10YR, 2.5Y, 2.5YR, 5Y, 5YR, 7.5YR		
	10Y-5GY Colors - Olive green		
	Gray 1 and 2 (2 separate charts)		
	5R individual soil chart		
	7.5R individual soil chart		
	"New" White page , 7.5R, 10YR, and 2.5Y		

	10Y and 5GY soil chart for glauconitic soils		
	5R soil chart for Australia and Southeast Asia		
	7.5R soil chart for tropical and semi-tropical soils		
	- Laminated Hard Cover, Glossy, Ring Binded Cover &		
	Sheets		
	With openings in between chips to allow easy visual		
	comparison with soil samples.		
	Color chips are mounted on neutral gray.		
	-Water-resistant sheets/pages		
	Latest Edition or equivalent		
	<b>Motorized ASTM Liquid Limit Machine</b>	1	
	with liquid, plastic and shrinkage accessories		
	Specifications:		
	with grooving tool, rough brass, with central smooth band 100mm wide		
	Power supply: 210-230V		
	Complete Plastic Limit accessories are Supplied in plastic case		
	Complete Shrinkage Limit accessories are Supplied in plastic case		
	c) Soil Microbiological		
	<b>Carbon Dioxide Respirometer Reader with Laptop and software included</b>	3	
	Specifications:		
	CO2 Concentration: 0 to minimum of 20,000 ppm		
	High precision, accurate, compact, durable and non-dispersive infrared gas analyzer of CO2		
	Accuracy: less than or equal to 1.5% of CO2 reading		
	Operation: standalone assay unit or attached to a compatible laptop unit		
	Operating temprature, relative humidity and pressure must be applicable to Philippine field set up		
	With internal or included rechargeable battery		
	Battery life: atleast 8 hours		
	Standard inclusions: Soil respiration chamber, durable case or container for easy transport of equipment and chamber		
	Optional inclusions: Environmental sensors (Soil temperature and moisture), extra compatible batteries		
	<b>With End-User training ( No. of pax: At least 2 pax) using the same brand and model of the offered equipment conducted by Authorized Representative/s of the Manufacturer with venue at manufacturer's training facility</b>		
	<b>Digital hand held microscope</b>	1	
	Specifications:		
	Flexible Led Control (FLD)		
	Automatic Magnification Reading (AMR)		
	Magnification: 10X-220X		
	Resolution (2560x1920)		

	Connection type (USB 3.0)		
	Inclusions: Platform stand/holder, Lens cleaner, Cable, Software		
	<b>Root Image Analyzer</b>	1	
	Non-destructive		
	Image resolution: up to 1200 DPI		
	System: Microsoft Windows 7, 8, 10		
	Scan Head Dimensions: 30-40 cm long × 4-5cm diameter		
	Requirements: Tablet with installed software and atleast 1GB Memory/RAM 1GHZ + Processor		
	Inclusions:		
	- at least 5 root tubes		
	Root Tube Dimensions:		
	Inner Diameter: atleast 5 cm (5cm min)		
	Outer Diameter: atleast 5 cm (5cm min)		
	Wall Thickness: atleast 3 mm		
	Length: atleast 100 cm		
	- Soil Auger		
	compatible for the root tubes included		
	<b>Drying oven</b>	1	
	Specifications:		
	Type: Air or Gravity Convection		
	<b>Chamber capacity: min of 30L</b>		
	Controller: microprocessor with external LCD graphic display		
	Temperature range: up to +330°C		
	Door type: solid/door viewing window		
	Interior: acid-proof stainless steel		
	Housing: power coated sheet		
	Power Requirements: 220-240 V, 60Hz		
	<b>Incubator</b>	1	
	Specifications:		
	Temperature Range: Ambient+(5°C to 10°C) -70°C		
	Temperature Uniformity(Maximum): ±1.2°C		
	Temperature Stability: ±0.2°C		
	Shelves: 2-3 layers		
	Electrical: 100-240 V, 50-60 Hz		
	<b>Tabletop Laminar Flow</b>	1	
	Specifications:		
	UV radiation level: Maximum 18 mW / cm <sup>2</sup> / sec		
	Radiation type : UV ( $\lambda$ = 253.7 nm), ozone-free		
	Digital time setting of direct UV exposure: 1 min–24 hrs / non–stop		
	UV protection: >99.90% Polymethyl methacrylate		
	Working area: L 600-700mm × W 400-500 mm		

	Overall dimensions (W×D×H): 690-750mm × 500-600mm × 500-600 mm		
	Working surface material: Steel with chemicals resistant powder coating		
	Working area: 645-655mm x 475-490mm		
	Nominal operating voltage: 100-240 V, 50/60Hz		
	<b>Laboratory Refrigerator (General Use)</b>	1	
	Specifications:		
	Temperature Range: 2~8°C		
	Capacity: Maximum 200 L		
	Refrigerant: CFC free (e.g. R744 / R290 / R134a / R600a or equivalent)		
	Defrost Method: No frost		
	Cooling Type: Forced air cooling		
	Power: 135 W; Power Supply: 220V, 50/60Hz		
	<b>Tabletop Autoclave</b>	1	
	Specifications:		
	Capacity: maximum 24L		
	Door: Manual, Automatic		
	Designed Pressure: atleast 15psi		
	Water Tank Volume: maximum 3.5L		
	Working Temp: 121-134°C		
	Vacuum system: High efficiency vacuum pump		
	Atmospheric Pressure: 76~106 kpa		
	Ambient Temp.: 5~40°C		
	Standard Accessories: USB/Printer		
	Power supply: 220V		
	Consumption: 3kVA		
	Maximum weight: 65 kg		
	<b>Single Chanel Pipetors</b>	1	
	Specifications:		
	Chemically resistant, Fully Autoclavable		
	Volume Adjustable, interchangeable, easy-grip ejector		
	with carousel, 1000 pipette tips per unit		
	Volumes:		
	1000-10,000 µl		
	500-5000 µl		
	100-1000 µl		
	10-100 µl		
	d) Standard inclusions:		
	inclusive of UPS for various sensitive equipment:		
	AAS		
	UV-Vis		
	<b>Nitrogen Distillation Unit</b>		
	<b>X-ray Fluorescence Spectrometer</b>		

	Cross Beater Mill		
	Carbon Dioxide Respirometer Reader		
	<b>Automated Saturated Hydraulic Conductivity System (2 station)</b>		
	Motorized ASTM Liquid Limit Machine		
	To include the following 5 pcs each of certified reference material (CRM) and History Proficiency Test Material / quality reference material (QRM)		
	Certified Reference Material for Agricultural Environment, Soil, 175g/bottle, Sandy Soil, Attach Certificate of Analysis (Must have NIST Traceability)		
	Soil parameters are the following but not limited to:		
	-Phosphorus (Olsen and Bray 1 Method)		
	-Exchangeable Bases Ammonium Acetate Extraction Method for Potassium, Sodium, Calcium and Magnesium		
	-Trace Elements DTPA Extraction Method for Zinc, Manganese, Copper and Iron		
	- Soil pH (1:1 Ratio)		
	- Soil Electrical Conductivity (1:1 Ratio)		
	- Organic Matter (Walkley-Black Method)		
	- Total Nitrogen (Kjeldahl Method)		
	History Proficiency Test Samples (Quality Reference Material) for Soil Chemistry and Physical Parameters; 4 samples per set, 1kg/bottle, with analysis report		
	Soil Parameters are the following but not limited to:		
	- Soil Electrical Conductivity (1:1 Soil-to-Water Ratio)		
	- Soil pH (1:1 Soil-to-Water Ratio)		
	- Available Phosphorus (Olsen and Bray Method)		
	- Exchangeable Bases Ammonium Acetate Extraction Method for Potassium, Sodium, Magnesium and Calcium		
	- Trace Elements DTPA Extraction Method (Iron, Copper, Zinc and Manganese)		
	- Soil Total Nitrogen (Kjeldahl)		
	- Soil Organic Matter (Walkley-Black)		
	- Cation Exchange Capacity		
	- Particle Size Analysis (Sand, Silt and Clay)		
	includes provisions to ensure storage and safety of equipment during transport (e.g. fixtures, dampening pads, antivibration pad, equipment brace, plexi glass.)		
	with Calibration Certificate from Competent Calibration Laboratory (PAB Accredited Calibration Laboratory or with Statement of Metrology)		
	e) After sales services specifications:		
	Inclusive: Commissioning and installation of all required instruments, equipment, and other accessories.		
	With end-users training and handbook on operation and maintenance of all instruments		

	Providing technical back-up (monitoring and trouble shooting) and after-sales services and guidance for improving the efficiency of the lab		
	Calibration, standardization & operation of all instruments		
	with standard two (2) years warranty on parts and services (calibration and preventive maintenance) for basic equipment		
	with three (3) years extended warranty on parts and services (calibration and preventive maintenance) for the following:		
	AAS		
	UV-Vis		
	<b>Nitrogen Distillation Unit</b>		
	<b>X-ray Fluorescence Spectrometer</b>		
	Cross Beater Mill		
	Carbon Dioxide Respirometer Reader		
	Automated Saturated Hydraulic Conductivity System		
	<b>Motorized ASTM Liquid Limit Machine</b>		
	with insurance coverage for all technical and scientific equipment (at least 3 years)		
	Submission to include proposed floor plan and layout for the Mobile Soil Laboratory, subject for approval of the BSWM-LSD.		
	<del>Submission of Authorized Distributorship for all equipment will be allowed. Authorized distributorship may come from an Exclusive Distributor company (to be evaluated during Post Qual).</del>		
	Must adhere to the statutory and regulatory requirements		
	<b>Compliance with Section VI. Schedule of Requirements</b>		

**Submission of Bid:**                   on or before April 11, 2024, 9:00AM

**Opening of Bids:**                   April 11, 2024, 9:30AM at the BSWM Convention Hall.

For guidance and information of all concerned.

**(Sgd)DENISE A. SOLANO**  
BAC Chairperson