

ITT 16.4	Period of time the Goods are expected to be functioning (for the purpose of spare parts): <i>10 years</i>
ITT 17.2 (a)	Manufacturer's authorization is: " <i>required</i> "
ITT 17.2 (b)	After sales service is: " <i>required</i> "
ITT 18.1	The Tender validity period shall be 119 days from the deadline for Tender Submission. i.e. : 12.04.2024.
ITT 18.3 (a)	Not Applicable.
ITT 19.1	<p>A Tender Security "<i>shall be</i>" required.</p> <p>The amount and currency of the Tender Security for each lot shall be as follows.</p> <p>Lot 1 : LKR 560,000.00 Lot 2 : LKR 550,000.00 Lot 3 : LKR 225,000.00 Lot 4 : LKR 645,000.00 Lot 5 : LKR. 35,000.00 Lot 6 : LKR. 475,000.00 Lot 7 : LKR. 400,000.00 Lot 8 : LKR. 175,000.00</p> <p>Tender Security shall be valid 147 days (from 15.12.2023 to 10.05.2024)</p> <p>A Tender-Securing Declaration "<i>shall not be</i>" required.</p> <p>If the Tenderer performs any of the actions prescribed in ITT 19.7 (a) or (b), the Recipient will declare the Tenderer ineligible to be awarded contracts by the Employer for a period of 03 years</p>
ITT 19.3 (d)	Other types of acceptable securities: None
ITT 20.1	In addition to the original of the Tender, the number of copies is: <i>01</i>
ITT 20.3	<p>The written confirmation of authorization to sign on behalf of the Tenderer shall consist of:</p> <p>a. Tenders submitted by a limited liability company or a corporation: It shall be signed by a duly authorized person(s) holding a Power of Attorney notarized by Attorney-at-law or shall include an authorization by the</p>

	<p>Company's or Corporation's Board of Directors by a Board resolution and certified by the Company Secretary authorizing for such person(s) to sign the documents.</p> <p>b. Tenders submitted by an individual or the Partnership: The person signing on behalf of the Tenderer shall be duly authorized person holding a Power of Attorney notarized by Attorney-at-law or in respect of a partnership shall include a copy of the partnership agreement to demonstrate relationship of the signing partner to the partnership.</p> <p>c. Tenders submitted by existing or intended Joint Venture (JV) shall include undertakings signed by the authorized person of each and every relevant party (i) stating that all parties shall be jointly and severally liable, and (ii) nominating a representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV during the Tender process and, in the event the JV is awarded the Contract, during contract execution.</p>
	D. Submission and Opening of Tenders
ITT 21.1	Tenderers " <i>shall not</i> " have the option of submitting their Tenders electronically.
ITT 22.1	<p>For <u>Tender submission purposes</u> only, the Purchaser's address is:</p> <p>Attention: Chairman Project Procurement Committee Reduction of Landslide Vulnerability by Mitigation Measures Project</p> <p>Address: National Building Research Organisation, No 99/1, Jawatta Road, Colombo 05.</p> <p>Country: Sri Lanka</p> <p>The deadline for Tender submission is:</p> <p>Date: <i>15.12.2023</i></p> <p>Time: <i>14.00 hrs</i></p>
ITT 25.1	<p>The Tender opening shall take place at:</p> <p>Address: National Building Research Organisation, No 99/1, Jawatta Road, Colombo 05.</p> <p>Country: Sri Lanka</p> <p>Date: <i>15.12.2023</i></p> <p>Time: <i>14.00 hrs</i></p>

ITT 25.6	All pages of the Letter of Tender and Price Schedules shall be initialed by 03 representatives of the Purchaser conducting Tender opening.
E. Evaluation and Comparison of Tenders	
ITT 30.3	The adjustment shall be based on the “ <i>average</i> ” price of the item or component as quoted in other substantially responsive Tenders. If the price of the item or component cannot be derived from the price of other substantially responsive Tenders, the Purchaser shall use its best estimate.
ITT 32.1	The currency that shall be used for Tender evaluation and comparison purposes to convert at the selling exchange rate all tender prices expressed in various currencies into a single currency is: <i>Sri Lankan Rupees (LKR)</i> The source of the selling exchange rate shall be: <i>Central Bank of Sri Lanka</i> The date for the selling exchange rate shall be: <i>17.11.2023</i>
ITT 33.1	Provisions for development of domestic industry (such as a margin of domestic preference) “ <i>shall not</i> ” apply.
ITT 34.2(a) ITT 34.2 (d)	Evaluation will be done for Lots(contracts) Note: <i>Tenders will be evaluated lot by lot.</i> <i>[If a Price Schedule shows items listed but not priced, their prices shall be assumed to be included in the prices of other items. An item not listed in the Price Schedule shall be assumed to be not included in the Tender, and provided that the Tender is substantially responsive, the average or highest price (as specified in the TDS ITT 30.3) of the item quoted by substantially responsive Tenderers will be added to the Tender price and the equivalent total cost of the Tender so determined will be used for price comparison.]</i>
ITT 34.6	The adjustments shall be determined using the following criteria, from amongst those set out in Section III, Evaluation and Qualification Criteria: (a) Deviation in Delivery schedule: <i>Yes</i> (b) Deviation in payment schedule: <i>No</i> (c) The cost of major replacement component, mandatory spare parts and service: <i>Yes</i>

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
Lot 2 - Procurement of Laboratory Equipment II					
2.1	Inductively Coupled Plasma Optical Emission Spectrometer with Auto Sampler				
2.1.1	Country of origin	To be specified			
2.1.2	Manufacture	To be specified			
2.1.3	Manufacturer's Authorization Letter	The letter from the manufacturer should be attached			
2.1.4	Make/Model	To be specified			
2.1.5	Warranty period	Two years from the date of installation and commissioning			
2.1.6	Spare parts availability	At least for 10 years			
2.1.7	After-sale service	Should be able to sign the maintenance agreement for a period of five years after termination of warranty period (minimum)			
Spectrometer Specifications					
2.2.1	The system mainframe	Benchtop			
2.2.2	System startup time	Should be specified from cold mode			
2.2.3	System type	Should be a simultaneous dual-view model			
2.2.4	Pump	Minimum three channels and 10 rollers peristaltic pump with variable speed (0-80 rpm) or better			
2.2.5	Sample introduction	The plug-and-play torch has the capability to automatically align the torch and connect gas lines and hydrofluoric acid resistance. An extra quartz torch should be supplied			
2.2.6	Gas operation Detector	Gases should be non-reactive, less consumption of required gases when the instrument is idle and in analysis mode, and fully computer-controlled plasma related gas flows			
		Plasma gas should have a mass flow control in the range of 0-20 L/min or better			
		Auxiliary gas should have a mass flow controller in the range of 0-2 L/min or better			
		Nebulizer gas should have a mass flow controlled in the range of 0-1.5 L/min or better			
2.2.7	Detector	Continuous wavelength coverage CCD or CID detector (If not please specify)			
2.2.8	Wavelength range	170-750 nm			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
2.2.16	Software-Cont.	Should give information on possible interference when selecting wavelength for analysis			
		A data export facility should be available for simple reporting of relevant results and transfer of data to Microsoft Excel			
2.2.17	Autosampler	A minimum of 100 positions for 15 mL tubes is required. The number of positions for 50 mL tubes should be specified clearly (If available), a minimum of 500 pieces of 15 mL and 50 mL tubes from each, and a minimum of 3 washing containers should be supplied.			
2.2.18	Power	230V, 50Hz, Single phase; Supply with 10kV UPS system with voltage stabilizer with 15 minutes power backup period			
2.2.19	Chemicals and consumables (Should quote separately)	1000 ± 0.5 mg/L solutions (Separate or Mixed) B Be Na K Mg Ca Ba Sr Sc Ti V Cr Mn Fe Co Ni Cu Zn Mo Ag Cd Pt Au Hg Al Ga Si Ge Sn Pb As Sb Bi Se			
		Trace analysis grade Nitric acid (2.5 L) 5 nos. should be supplied with the instrument			
		500 nos. of Nylon filters (0.45 µm, 25 mm) should be supplied			
2.2.20	Water Chiller	should be supplied with the instrument (If not applicable please specify clearly)			
2.2.21	Spare kit (Should quote separately)	Additional sampling introduction kits including nebulizer, spray chamber, torch, and tubing should be supplied			
2.2.22	Computer and Printer	Computer (i5, 8GB RAM, 500 GB hard drive), monitor (24 Inch), and printer (color) and genuine versions of OS should be supplied along with the instrument			
2.2.23	Peripherals	Corresponding gas regulators of high quality, Gas purification traps, gas lines, and Separate exhaust vents for ICP-OES and Autosampler.			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
		Dimensions of installation site and instrument should be specified			
		Operating temperature and humidity should be specified clearly			
		The system must be factory tested and a certificate should be provided			
		Troubleshooting and analyzing techniques should be given by application and technical experts			
Lot 3 - Procurement of Laboratory Equipment III					
3.1	Microwave Digester				
3.1.1	Country of origin	To be specified			
3.1.2	Manufacture	To be specified			
3.1.3	Manufacturer's Authorization Letter	The letter from the manufacturer should be attached			
3.1.4	Make/Model	To be specified			
3.1.5	Warranty period	Two years from the date of installation and commissioning			
3.1.6	Spare parts availability	At least for 10 years			
3.1.7	After-sale service	Should be able to sign the maintenance agreement for a period of five years after termination of warranty period (minimum)			
3.1.8	Microwave power	Should be adjustable (0-2000 W)			
3.1.9	Number of vessels	24 Nos. in a rotor			
3.1.10	Material of vessels	TFM or PTFE			
3.1.11	Warranty of vessels	Should be specified (will be added qualification)			
3.1.12	The internal volume of vessels	40 mL or better			
3.1.13	Maximum fill volume	30 mL or better			
3.1.14	Minimum sample weight to be handled	1000 mg for inorganic 250 mg for organic			
3.1.15	Maximum Working Temperature	250°C or better			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
		Operating temperature and humidity should be specified clearly			
		The system must be factory tested and a certificate should be provided			
		Troubleshooting and analyzing techniques should be given by application and technical experts			
3.1.30	Applications	Soil with high organics, Fertilizer, Food with high fats, Cosmetics, Pharmaceuticals, Wastewater, Cement, Admixtures, other construction materials (Si content is required), Mineral aggregates, etc.			

Item No.	Features	Required Specification	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
Lot 4 - Procurement of Laboratory Equipment IV					
4.1	Hydraulic Servo Powered Universal Testing Machine 100kN capacity				
4.1.1	Country of Origin	To be specified			
4.1.2	Warranty Period	03 years			
4.1.3	After sale service	Required			
4.1.4	Manufacture	To be specified			
4.1.5	Made	To be specified			
4.1.6	Model name	To be specified			
4.1.7	Measuring Range	0.01kN- 100kN			
4.1.8	Purpose	100kN Universal Tensile Testing Machine For testing building materials such as rebar- 1-10mm dia., Plastic, PVC, Fiber, Geo Textile, Wires, Rope, Films, high tensile wires, polythene sheet, mild sheet wire, copper and aluminum wires, plant roots etc.			
4.1.9	Load Cell Standard	ISO 376 Class: 01			
4.1.10	Machine Standards	EN 10080, ISO 15630-1; EN ISO 6892-1; ASTM A370, E8 ISO 10319:2015			
4.1.11	Tensile Load Capacity	100 kN			
4.1.12	Compression Load Capacity	100 kN			
4.1.13	Load Accuracy	± 1% or less on Full Scale			
4.1.14	Deformation Accuracy	± 1% or less on Full Scale			

Item No.	Features	Required Specification	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
4.1.48	Special Notes	All relevant corresponding specifications MUST be clearly marked and highlighted on the product brochure and same has to be clearly written on the Bidder's Comments column of this form. All commented specifications should be available on the product brochure. Letters from the Manufacturer confirming specifications are not accepted. With the bidding documents submitted the relevant brochures			
4.2	Humidity Cabinet				
4.2.1	Warranty period	03 years			
4.2.2	After sale services	required			
4.2.3	Country of Origin	To be specified			
4.2.4	Manufacturer	To be specified			
4.2.5	Make	To be specified			
4.2.6	Model Name	To be specified			
4.2.7	Qty	01 Item			
4.2.8	Purpose	The system shall be capable of performing the temperature and humidity tests as per the following standards:			
4.2.9	Complied standard	EN 196, EN 772-14, BS 7263-3, ASTM C1396			
4.2.10	Manufacture details	Inner body- Stainless Steel Outer body- Mild Steel Powder Coated Capacity – Minimum 500 ltrs (Overall dimensions should be specified) Coming with wheel support for mobility			
4.2.11	Service conditions	Temperature min. 10°C to max. 45°C Humidity min.10% to max.95%			
4.2.12	Specification	Temperature min. -20°C to max. 60°C Humidity min.17% to max.95% or specify			

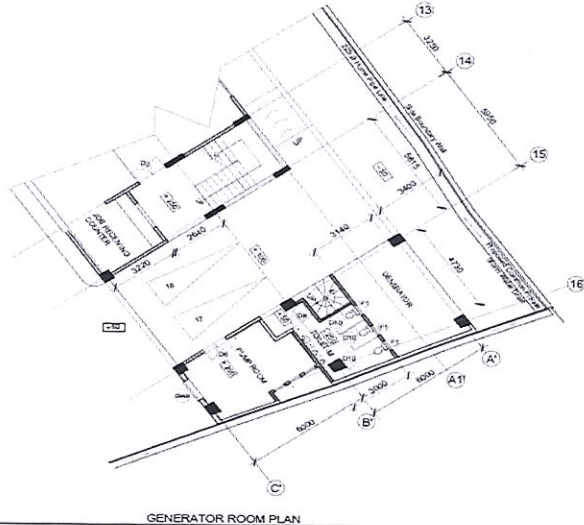
Item No.	Features	Required Specification	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
4.11.3	Laser class	2			
4.11.4	Self-levelling range	$\pm 5^\circ$ longitudinal axis, $\pm 3^\circ$ traverse axis			
4.11.5	Levelling time	4s			
4.11.6	Dust and splash protection	IP 5X			
4.11.7	Power supply	3 x 1.5 V LR6 (AA) or rechargeable			
4.11.8	Operating time	24 h			
4.11.9	Includes	Multifunctional mount Protective Bag 3 x 1.5 V LR6 battery (AA)			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
Lot 5 - Procurement of Cameras & Printer					
5.1	Camera				
5.1.1	Camera Format	APS-C (1.5x Crop Factor or higher)			
5.1.2	Minimum Pixels	Actual: 24 Megapixel Effective: 24 Megapixel			
5.1.3	Maximum Resolution	6000 x 4000			
5.1.4	Aspect Ratio	3:2			
5.1.5	Sensor Type	CMOS			
5.1.6	Minimum Sensor Size	23.5 x 15.6 mm			
5.1.7	Image File Format	JPEG, Raw			
5.1.8	Exposure Control ISO Sensitivity	Auto, 100 to 25600			
5.1.9	Shutter Speed	Electronic Front Curtain Shutter 1/4000 to 30 Seconds 1/4000 to 1/4 Second in Movie Mode Bulb Mode			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
5.1.10	Metering Method	Center-Weighted Average, Multi-Zone, Spot			
5.1.11	Exposure Modes	Aperture Priority, Manual, Program, Shutter Priority			
5.1.12	Exposure Compensation	-5 to +5 EV (1/3, 1/2 EV Steps)			
5.1.13	Metering Range	0 to 20 EV			
5.1.14	White Balance	Auto, Cloudy, Color Temperature, Color Temperature Filter, Custom, Daylight, Flash, Fluorescent (Cool White), Fluorescent (Day White), Fluorescent (Daylight), Fluorescent (Warm White), Incandescent, Shade, Underwater			
5.1.15	Continuous Shooting	Up to 11 fps			
5.1.16	Self-Timer	2/10-Second Delay			
5.1.17	Video Recording Modes	XAVC S Full HD (1920 x 1080) at 24.00p/29.97p/59.94p [50 Mb/s] or Higher Resolution AVCHD Full HD (1920 x 1080) at 59.94p [28 Mb/s] or Higher Resolution Full HD (1920 x 1080) at 24.00p/59.94i [17 to 24 Mb/s] or Higher Resolution MP4 HDV (1440 x 1080) at 29.97p [12 Mb/s] SD (640 x 480) at 29.97p [3 Mb/s]			
5.1.18	Recording Limit	Up to 29 Minutes, 59 Seconds			
5.1.19	Video Encoding	NTSC			
5.1.20	Audio Recording	Built-In Microphone (Stereo)			
5.1.21	Focus Focus Type	Auto and Manual Focus			
5.1.22	Focus Mode	Automatic (A), Continuous-Servo AF (C), Direct Manual Focus (DMF), Manual Focus (M), Single-Servo AF (S)			
5.1.23	Autofocus Points	Phase Detection: 179 Contrast Detection: 25			
5.1.24	Autofocus Sensitivity	-4 to +20 EV			
5.1.25	Viewfinder and Monitor Viewfinder Type	Electronic or similar			
5.1.26	Viewfinder Size	0.39"			
5.1.27	Viewfinder Resolution	1,440,000 Dot			
5.1.28	Viewfinder Eye Point	23 mm			
5.1.29	Viewfinder Coverage	100%			
5.1.30	Viewfinder Magnification	Approx. 1.07x			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
5.1.31	Diopter Adjustment	-4 to +3			
5.1.32	Monitor Size	3"			
5.1.33	Monitor Resolution	921,600 Dot			
5.1.34	Monitor Type	Tilting LCD or similar			
5.1.35	Flash Built-In Flash	Yes			
5.1.36	Dedicated Flash System	TTL			
5.1.37	External Flash Connection	Hot Shoe, Wireless			
5.1.38	Flash Modes	Auto, Fill Flash, Off, Rear Sync, Red-Eye Reduction, Slow Sync, Wireless			
5.1.39	Maximum Sync Speed	1/160 Second			
5.1.40	Flash Compensation	-3 to +3 EV (1/3, 1/2 EV Steps)			
5.1.41	Interface Memory Card Slot	<i>Single Slot: SD/SDHC/SDXC/Memory Stick Duo Hybrid (UHS-I)</i>			
5.1.42	Connectivity	<i>HDMI D (Micro), Wired Remote Port, USB Micro-B (USB 2.0)</i>			
5.1.43	Wireless	<i>Wi-Fi</i>			
5.1.44	Physical Battery	<i>1 x Rechargeable Lithium-Ion, 7.2 VDC, 1080 mAh</i>			
5.1.45	Accessories	18-45mm (Kit Lens) Additional Rechargeable Lithium-Ion Original Battery 64GB Ultra UHS-I SDHC Memory Card Multi Card Reader USB 3.0 Standard Shoulder Bag & Professional Cleaning kit			
5.2	Multi-function printing solution				
5.2.1	Country of Origin	To be specified			
5.2.2	Warranty Period	One-year unit exchange warranty			
5.2.3	After sale service	Required			
5.2.4	Manufacture	To be specified			
5.2.5	Made	To be specified			
5.2.6	Model name	To be specified			
5.2.7	Minimum Copy / Print Speed (ppm)	<i>Color 20 B & W 20</i>			
5.2.8	Warm-up Time	<i>Approx. 20 sec.</i>			
5.2.9	Minimum Memory	<i>2 GB</i>			
5.2.10	Minimum Storage	<i>250GB Self-Encryption</i>			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
5.2.11	Dimension (W × D × H)	585 × 641* × 787 mm / 23" × 25.2"* × 31"*			
5.2.12	Weight	Less than 78.1 kg / 172.2 lb			
5.2.13	Input Paper Capacity	Standard 1,200 sheets Maximum 3,200 sheets			
5.2.14	Available Paper Weight	52 - 280 g/m ² / 14 lb. Bond - 100 lb. Cover			
5.2.15	Available Paper size	100 × 148 to 320 x 460mm / 100 × 148 to 12.6" x 18.1", Banner paper (1,200 mm)			
5.2.16	Document feeder	100-sheet DSDf			
5.2.17	Copier Feature First Copy Speed	Color Less than 7.8 sec. B & W Less than 5.9 sec.			
5.2.18	Resolution	600 × 600 dpi			
5.2.19	Multiple Copy	Up to 999			
5.2.20	Printer Feature Resolution	600dpi x 600dpi 5bit*1 2400dpi (Equivalence) x 600dpi (with smoothing) *2 *1 or *2 is selected by copy mode automatically. No selectable by user.			
5.2.21	PDL	PCL6 Emulation or PS3 Emulation or XPS			
5.2.22	Interface	Standard USB (High speed), 10/100/1000BASE-T Option Wireless LAN (IEEE802.11 b/g/n), Bluetooth			
5.2.23	Scanner Feature Resolution	100/150/200/300/400/600dpi			
5.2.24	Scan Speed	DSDf Up to 240 spm (Duplex) / Up to 120 spm (Simplex) (300 dpi)			
5.2.25	Data format	Standard TIFF, PDF, XPS, JPEG, Slim PDF, PDF/A Option DOCX, EXLS, PPTX, Searchable PDF			
5.2.26	Scan Protocol	SMB, FTP, IPX/SPX, FTPS, USB, Netware			
5.2.27	Scan features	File, Email, USB, e-Filing Box, TWAIN, Local HDD, Share Point, iFax, Fax, WS Scan			
5.2.28	Internet Fax	ITU-T T.37 (Simple mode)			
5.2.29	Security Feature Standard	Self-encryption HDD with Wipe technology, TLS, Private Print, Encrypted print, Tracking Print, Encrypted PDF, User Authentication, Role Based Access Control, IP/MAC Address filtering, SNMPv3, 802.1X for Wired/Wireless, Fax secure receiving, Fax mis-sending prevention, Security event logging, Password Policy, Integrity Check, HCD-PP			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
Lot 06 - Procurement of Generator system					
6.1	Generator System 400 kVA				
		 <p style="text-align: center;">GENERATOR ROOM PLAN</p>			
6.1.1	Name and address of assembling party	Please specify.			
6.1.2	Country of origin	Please specify.			
6.1.3	Country of assembly	Please specify.			
6.1.4	Location of factory	Please specify.			
6.1.5	Make and Model	Please specify.			
6.1.6	Manufacturer's Authorization Letter	Letter from manufacturer should be attached.			
6.1.7	Whether assembler has ISO 8528 / 9001/ 9002 certificate?	Original document from manufacturer should be attached.			
6.1.8	Spare parts availability	At least for 10 years (Letter should be attached).			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
6.1.9	Noise level at 1m distance away from generator room outer wall when running at full load [db (A)]	Please specify.			
6.1.10	Out put in kVA (Prime/ Standby)	400kVA/450kVA			
6.1.11	Frequency	50Hz			
6.1.12	Base fuel tank capacity	Please specify.			
	(a) 25% load				
	(b) 50% load				
	(c) 75% load				
	(d) 100% load				
	(e) 110% load				
6.1.13	Frequency increase at 100% load rejection at 0.8 power factor	Original document from manufacturer should be attached.			
6.1.14	Recovery time for at 100% load rejection at 0.8 power factor	Original document from manufacturer should be attached.			
6.1.15	Frequency drop at 75% sudden load application at 0.8 power factor	Original document from manufacturer should be attached.			
6.1.16	Recovery time for at 75% sudden load application at 0.8 power factor	Original document from manufacturer should be attached.			
6.1.17	Warranty period (hours per year)	Two year from date of installation and commissioning.			
6.1.18	How many free services provide in the warranty period.	04 free services should be provided during the warranty period.			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
6.1.19	After sale service	Should be able to sign the maintenance agreement for a period of five years (Sample agreement to be attached).			
6.1.20	Frequency increase at 100% load rejection at 0.8 power factor	Original document from manufacturer should be attached.			
6.1.21	Recovery time for at 100% load rejection at 0.8 power factor	Original document from manufacturer should be attached.			
6.1.22	Frequency drop at 75% sudden load application at 0.8 power factor	Original document from manufacturer should be attached.			
6.1.23	Recovery time for at 75% sudden load application at 0.8 power factor	Original document from manufacturer should be attached.			
6.1.24	Warranty period (hours per year)	Two year from date of installation and commissioning.			
6.1.25	How many free services provide in the warranty period.	04 free services should be provided during the warranty period.			
6.1.26	After sale service	Should be able to sign the maintenance agreement for a period of five years (Sample agreement to be attached).			
6.1.27	Generator Emissions 75% load at 0.8 power factor				
	(a) Nitrogen Oxide(NOx)				
	(b) Carbon Monoxide(CO)				
	(c) Hydrocarbons (HC)				
	(d) Particular Matter (PM)				
	Engine				
6.1.28	Name and address of engine Manufacturer.	Please specify.			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
6.1.29	Country of Origin	Please specify.			
6.1.30	Country of manufacture	Please specify.			
6.1.31	Location of factory	Please specify.			
6.1.32	Make and Model	Caterpillar, Perkins, Cummins, Volvo, MTU, or equ.			
	Gen set should be manufactured by engine or alternator manufacturer	To be confirmed			
6.1.33		Item Deleted			
6.1.34	Year of manufacture	Please specify.			
6.1.35	Whether manufacturer has ISO 9001/9002 QA certificate?	Original document from manufacturer should be attached.			
6.1.36	Local agent for this engine.	Please specify. (If you are the local agent, Letter from manufacturer should be attached.)			
6.1.37	Type of governor	Electronic Governor			
6.1.38	Rated speed	1500rpm			
6.1.39	Type of cooling system	Water cool			
6.1.40	Type of radiator	Tropical Radiator			
6.1.41	Prime Power rating	400 KVA at 30 Deg. C temp. 60 % relative humidity & 500m altitude			
6.1.42	Please state de-rating factors for the following;				
	(a) Temperature	Please specify.			
	(b) Relative Humidity	Please specify.			
	(c) Altitude	Please specify.			
6.1.43	Type of Lubricant Oil used	Please specify.			
6.1.44	Type of fuel proposed	Please specify.			
6.1.45	Type of protections provided				
	(a) Low oil pressure	Please specify.			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
	(b) High water temperature	Please specify.			
6.1.46	Emission Standard	US, EPA or EU (Original document from manufacturer should be attached)			
	Alternator				
6.1.47	Name and address of alternator Manufacture.	Please specify.			
6.1.48	Country of Origin	Please specify.			
6.1.49	Country of manufacture	Please specify.			
6.1.50	Location of factory	Please specify.			
6.1.51	Make and Model	Leroy Somer, Stamford, Mec Alte or equ.			
6.1.52	Brushless and self excited	To be confirmed			
6.1.53	Year of manufacture	Please specify.			
6.1.54	Whether manufacturer has ISO 9001/9001 QA certificate?	Original document from manufacturer should be attached.			
6.1.55	No. of years manufacturer is in manufacturing of alternators	Please specify.			
6.1.56	Output in kVA (Prime/standby)	400kVA/ 450kVA			
6.1.57	Rated Voltage	400V			
6.1.58	Number of Phase	3 Phase			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
6.1.59	Class of insulation	Class H			
6.1.60	Type of anti condensation heaters	Please specify.			
6.1.61	Type of protections				
	(a) Over current	Please specify.			
	(b) Over voltage	Please specify.			
	Sound attenuation system				
6.1.62	Name of manufacturer	Please specify.			
6.1.63	Country of manufacture	Please specify.			
6.1.64	Sound level db (A)]	Please specify.			
6.1.65	No. & type of fire extinguishers provided	Please specify.	Item Deleted		
	Control Panel /Switchgear				
6.1.66	Name and address of control panel Manufacture.	Please specify.			
6.1.67	Country of Origin	Please specify.			
6.1.68	Country of manufacture	Please specify.			



Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
6.1.69	Location of factory	Please specify.			
6.1.70	Make and Model	Please specify.			
6.1.71	Whether manufacturer has ISO 9001/9002 QA certificate?	Original document from manufacturer should be attached.			
6.1.72	Type of cubicle	Please specify.			
6.1.73	Type of mounting of cubicle	Please specify.			
6.1.74	Rating of generator circuit breaker (Amp)	630A			
6.1.75	No. of poles of circuit breaker	3 Pole			
	Availability of Meters and Indicators				
6.1.76	Tacho meter	Please specify.			
6.1.77	Frequency meter	Please specify.			
6.1.78	Hour run recorder	Please specify.			
6.1.79	Lubricant oil pressure gauge	Please specify.			
6.1.80	Water temperature gauge	Please specify.			
6.1.81	Duty selector switch	Please specify.			


Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
6.1.82	Digital multi-function meter (A, V, kWh, kW, KVA, p.f. etc)	Please specify.			
6.1.83	Current (three phases)	Please specify.			
6.1.84	Voltage (phase-phase & phase-neutral)	Please specify.			
6.1.85	Power factor	Please specify.			
6.1.86	Emergency stop push button	Please specify.			
6.1.87	Lamp test button	Please specify.			
6.1.88	Tickle charge complete with A/ meter	Please specify.			
6.1.89	Low oil pressure shut down indication	Please specify.			
6.1.90	High water temp shut down indication	Please specify.			
6.1.91	Over speed shut down indication	Please specify.			
6.1.92	Over current trip indication	Please specify.			
6.1.93	Over voltage trip indication	Please specify.			
6.1.94	Fail to start indication	Please specify.			
6.1.95	Mains on-load indication	Please specify.			


Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
6.1.96	Generator on-load indication	Please specify.			
6.1.97	Indication reset button	Please specify.			
6.1.98	Availability of remote monitoring/ control through internet or intranet	Please specify.			
6.2	ATS PANEL (MCCB Type, Form 3b)	Supply and installation of ATS panel with LV cables & ATS manufacturer shall follow IEC 60439/61439 standard.			
6.2.1	Name of manufacturer	Please specify.			
6.2.2	Country of manufacturer	Please specify.			
6.2.3	Location of factory	Please specify.			
6.2.4	Make & Model	Please specify.			
6.2.5	Cable length of 18m (185mm ² x 4C)	Please specify.			
6.3	Testing, commissioning and training of owner's staff assigned for generator OPERATION at the site.	Required.			

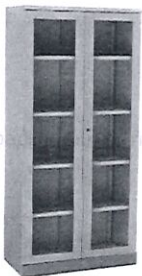
Please consider the followings.


- Refer Annex 01 for Detailed Specification requirement of Generator system mentioned at the end of this Section 3.
- The Maintenance agreement for 05 years after the first 02 years, shall be submitted in accordance with the Annex 02- Maintenance Price Schedule Form.
- The Unit Price mentioned in the Price Schedule shall consist with all the components listed in the Annex 03 – Itemized Price Schedule for Lot 06.


Item No.	Features	Required Specification.	Tenderer's Specifications			
			Tenderer's Response		If 'No', Comments on the offer	
			Yes	No		
Lot 07 – Procurement of Mounting Tables & Accessories I						
7.1	Center work Stainless table - Cement Laboratory					
7.1.1	Specification	Size - (2000mm L x 1200mm W x 1000mm H)				
						
		Work Top - Suitable for Heavy Duty work and should be clean easily				
		Material-Stainless Steel,				
		Frame material-High gauge steel powder coated				
		High adjustable - within ± 300 mm range				
		leveling bottom screws in the legs				
		Can be able to bear 500Kg weight				
03 Fixed Drawers cupboards -02Nos.(Lockable)						
Bottom Movable/Fixed cupboard in edges -02Nos.(Lockable)						
7.1.2	Accessories	Height Adjustable 2 chairs without back support				
7.2	Anti-Vibrational Table - Cement Laboratory					
7.2.1	Specification	Size - (1200mm L x 600mm W x 900mm H)				
						

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
		Material - Should be specified			
		Work Top - Suitable for Heavy Duty work and should be clean easily Material-Stainless Steel, Frame material-High gauge steel powder coated			
		leveling bottom screws in the legs			
		Can be able to bear 250kg weight			
		03 Fixed Drawers cupboards -02Nos.(Lockable)			
		Bottom Movable/Fixed cupboard in edges -02Nos.(Lockable)			
7.2.2	Accessories	height Adjustable 2 chairs without back support			
7.3	Leveling Table I - Cement Laboratory				
		Size - (2000mm L x 600mm W x 900mm H)			
7.3.1	Specification				
		Work Top - Should be clean easily			
		leveling bottom screws in the legs			
		Can be able to bear 250kg weight			
		03Fixed Drawers Cupboard-01No. (Lockable)			
		Fixed cupboard 01No.(Lockable)			
7.3.2	Accessories	Height Adjustable 2 chairs without back support			

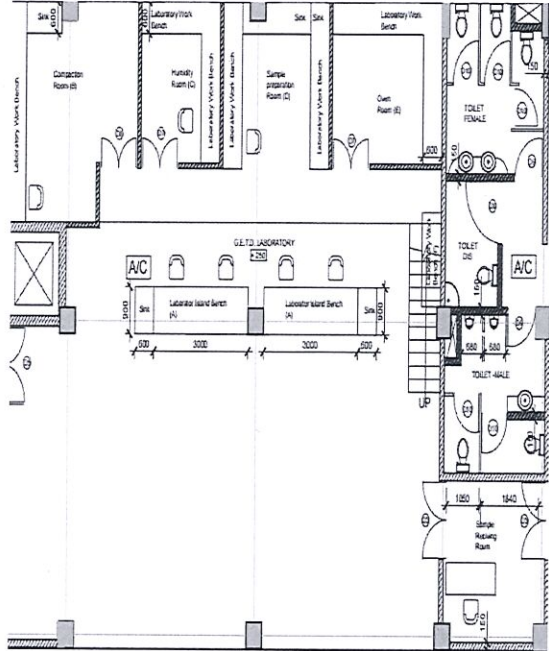
Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
7.4	Working Table - Research and Miscellaneous Testing Area				
7.4.1	Specification	<p>Size - (2000mm L x 1500mm W x 900 mm H)</p>  <p>Material - 18 to 20mm thick phenolic resin or better material leveling bottom screws in the legs Work Top - Chemical resistance & Should be clean easily Drawer with cupboards-04Nos. Fixed cupboard (Lockable) Item Deleted 13A electrical outlets with power panel - 4</p>			
7.4.2	Accessories	height adjustable 4 chairs with back support			
7.5	Glassware Cabinet - Research and Miscellaneous Testing Area				
	Use to store the glassware				
7.5.1	Specification	Size - (800mm L x 400mm W x 1800mm H)			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
					
		Material - Should be specified			
		4 racks - Different rack height			
		Glass (Transparent) lockable 2 shelves doors			
7.6	Chemical Storage - Research and Miscellaneous Testing Area				
	Use to store the chemicals				
		<i>Size - (600mm D x 600mm W x 1800mm H)</i>			
7.6.1	Specification				
		Material - Should be specified			
		No of Drawers - 4 (Max Load of drawer 30kg)			
		Glass (Transparent) lockable door			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
		Should have Regulation compliant storage of water hazardous and poisonous substances in laboratories			
7.7	Leveling Table II - Research and Miscellaneous Testing Area				
	for Geo textile testing				
		Size - (2000mm L x 600mm W x 900mm H)			
7.7.1	Specification				
		Work Top - Should be clean easily			
		leveling bottom screws in the legs			
		Can be able to bear 250kg weight			
		03 Fixed Drawers Cupboards - 1No. (Lockable)			
		Fixed cupboard with 02 shelves – 2Nos.(Lockable)			
7.7.2	Accessories	height adjustable 2 chairs without back support			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
7.8	Center Work Leveling Table - Main Laboratory				
		for mortar and grout testing section			
7.8.1	Specification	Size - (2000mm L x 850mm W x 900mm H)			
					
		Work Top - Suitable for Heavy Duty work and should be clean easily			
		High adjustable - within ± 300 mm range			
		leveling bottom screws in the legs			
		03 Fixed Drawers Cupboards - 1No. (Lockable)			
		Can be able to bear 500Kg weight			
		Fixed cupboard with 02 shelves – 2Nos.(Lockable)			
7.8.2	Accessories	Suitable 2 chairs without back support			
7.9	Leveling Table III - Main Laboratory				
		for mechanical testing			
7.9.1	Specification	Size - (2000mm L x 600mm W x 900mm H)			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
					
		Work Top - Suitable for Heavy Duty work and should be clean easily			
		High adjustable - within ± 300 mm range			
		leveling bottom screws in the legs			
		Can be able to bear 500Kg weight			
		03 Fixed Drawers Cupboards - 1No. (Lockable)			
		Fixed cupboard with 02 shelves – 2Nos.(Lockable)			
7.9.2	Accessories	Suitable 2 chairs without back support			
7.10	Leveling Table IV - Main Laboratory				
	for Oven Placing				
		Size - (2000mm L x 800mm W x 750mm H)			
7.10.1	Specification				
		Work Top - Should be clean easily			
		Durable for heat			
		leveling bottom screws in the legs			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
		 <p>Laboratory Area 1 (Please refer the required table arrangement/ CAD drawing of floor will be provided at the time of tendering)</p>			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
		<p style="text-align: center;">Laboratory Area 2</p>			
7.18	Laboratory Island Bench - (A)				
7.18.1	Warranty Period	Warranty Period- Two years from the date of installation and commissioning)			
7.18.2	After sale Services	Should provide			
7.18.3	Country of origin	Should indicate			
7.18.4	Manufacturer	Should indicate			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
7.18.5	Supplying & installation	Supplying & installation of Laboratory Island Benches of the following dimensions according to the available space of the Lab (Please note that dimension variation should not exceed 5 %) 3000mm (L) × 900mm (W) × 900mm (H)			
		Bench top to be water, heat, chemical resistance, high durability, non-porous, scratch resistant, strong and cleanable material.			
		Under bench cabinets rests on frames and should be supported on heavy-duty steel frames fully carrying the load on worktops.			
		Should provide knee/ leg space and should facilitate uninterrupted lateral movement of the under bench units within the bench run.			
		Corrosion and chemical –resistant and easy cleaning, laboratory sink to be fitted to the Island Bench with necessary fittings. Rectangular, deep single bowl sink with self-draining flat base. 3-way cross type laboratory water cock to be mounted on the sink.			
		The cabinets are to be constructed with an integrated plinth of 100mm to keep the bottom elevated from the floor. Under bench cupboard and shelves (Minimum 4 cupboards with 2 shelves) should be designed to utilize maximum storage capacity with minimal disturbance for leg space. All drawers and cupboards are lockable and have to be resistance to the all kind of chemical spills and water splashes.			
		02 Nos. of electrical sockets of IP 55 grade with splash proof box type covering of 230 volt, 13 Amp, 50Hz are required.			
7.19	Laboratory work bench I - for Compaction room, Humidity room, Sample preparation room, - (B), (C), (D)				
7.19.1	Warranty Period	Warranty Period- Two years from the date of installation and commissioning			
7.19.2	After sale Services	Should provide			
7.19.3	Country of origin	Should indicate			
7.19.4	Manufacturer	Should indicate			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
7.19.5	Supplying & installation	<p>Supplying & installation of Laboratory work benches of the following dimensions according to the available space of the Lab (Please note that dimension variation should not exceed 5 %)</p> <p>Length of the bench should be well fitted perimeter of the relevant partition, 600 mm (W) and 900 mm (H). 900mm-(W) × 900mm-(H) ×(L)-As per the drawing</p> <p>Bench top to be water, heat, chemical resistance, high durability, non-porous, scratch resistant, strong and cleanable material.</p> <p>Under bench cabinets rests on frames and should be supported on heavy-duty steel frames fully carrying the load on worktops.</p> <p>This should provide knee/ leg space and should facilitate uninterrupted lateral movement of the under bench units within the bench run.</p> <p>Corrosion and chemical –resistant and easy cleaning, laboratory sink to be fitted to the Island Bench with necessary fittings. Rectangular, deep single bowl sink with self-draining flat base. 3-way cross type laboratory water cock to be mounted on the sink.</p> <p>The cabinets are to be constructed with an integrated plinth of 100mm to keep the bottom elevated from the floor. Under bench cupboard and shelves (Minimum 3 and maximum 5 cupboards with 2 shelves) should be designed to utilize maximum storage capacity with minimal disturbance for leg space. All drawers and cupboards are lockable and have to be resistance to the all kind of chemical spills and water splashes. 02 Nos. of electrical sockets of IP 55 grade with splash proof box type covering of 230 volt, 13 Amp, 50Hz are required for each work bench.</p>			
7.20	Laboratory work bench for Oven room, - (E)				
7.20.1	Warranty Period	Warranty Period- Two years from the date of installation and commissioning			
7.20.2	After sale Services	Should provide			
7.20.3	Country of origin	Should indicate			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
7.20.4	Manufacturer	Should indicate			
7.20.5	Supplying & installation	Supplying & installation of Laboratory work benches of the following dimensions according to the available space of the Lab (Please note that dimension variation should not exceed 5 %) Length of the bench should be well fitted perimeter of the relevant partition, 600 mm (W) and 900 mm (H). 900mm-(W) × 900mm-(H) ×(L)-As per the drawing			
		Bench top to be water, heat, chemical resistance, high durability, non-porous, scratch resistant, strong and cleanable material.			
		Under bench cabinets rests on frames and should be supported on heavy-duty steel frames fully carrying the load on work benches.			
		This should provide knee/ leg space and should facilitate uninterrupted lateral movement of the under bench units within the bench run.			
		Corrosion and chemical –resistant and easy cleaning, laboratory sink to be fitted to the Island Bench with necessary fittings. Rectangular, deep single bowl sink with self-draining flat base. 1-way cross type laboratory water cock to be mounted on the sink.			
		The cabinets are to be constructed with an integrated plinth of 100mm to keep the bottom elevated from the floor. Under bench cupboard and shelves (Minimum 3 and maximum 4 cupboards with no shelves) should be designed to utilize maximum storage capacity with minimal disturbance for leg space. All cupboards are lockable and have to be resistance to the all kind of chemical spills and water splashes.			
		2 Nos. of electrical sockets of IP 55 grade with splash proof box type covering of 230 volt, 13 Amp, 50Hz are required for each work bench.			
7.21	Laboratory Chairs				
7.21.1	Warranty Period	Warranty Period- Two years from the date of installation and commissioning			
7.21.2	After sale Services	Should provide			
7.21.3	Country of origin	Should indicate			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
7.21.4	Manufacturer	Should indicate			
7.21.5		10. Nos of laboratory chairs should be supplied for (A), (B), (C), (D), (G) areas. Comfortable, height adjustable, low back support/arm, movable 5 legged base laboratory chairs for the seating requirement.			

ADDENDUM 01

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
	General				
8.1	Country of origin	To be specified			
8.2	Manufacture	To be specified			
8.3	Manufacturer's Authorization Letter	The letter from the manufacturer should be attached			
8.4	Make/Model	To be specified			
8.5	Warranty period	Two years from the date of installation and commissioning			
8.6	After-sale service	Should provide			
8.7	Laboratory Bench (01 Nos.)- (P/S)	Refer to the dimensions of the updated figure (Maximum tolerance for the dimensions is $\pm 10\%$). Height: 900 mm.			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
8.8	Laboratory Bench (01 Nos.)- (Q/R)	<p>Each Bench top should be finished with materials resistant to heat, chemicals, moisture, and scratches: (Granite or Phenolic resins or feldspar)</p> <p>Worktop thickness should not be less than 18 mm</p> <p>The bench should be arranged as per the schematic diagram and the Structure should be steel box bar structure or c-frame structure: (Please note that both designs can be quoted for the single supplier as separate options)</p> <p>The under-bench welded units should be supported on heavy-duty steel frames fully carrying the load of worktops.</p> <p>All frame-work should be pre-treated with a superior pure epoxy powder-coated finish.</p> <p>Refer to the dimensions of the updated figure (Maximum tolerance for the dimensions is $\pm 10\%$).</p> <p>Two polypropylene molded sinks are not required.</p>			
8.9	Laboratory Bench (01 Nos.)- (Q/R)-cont.	<p>Under bench cupboard and shelves (Min 3 cupboards and shelves for each) should be designed to utilize maximum storage capacity with minimal disturbance for leg space. All drawers and cupboards are lockable and have to be resistant to all kinds of chemical spills and water splashes.</p> <p>Two polypropylene molded sinks, made up of 5 mm thick high-density and elastic polypropylene with good resistance to organic solvents and corrosive chemicals should be moulded on each bench. The faucet should be a 3-way type faucet and the bowl size of the sink should be clearly mentioned.</p> <p>12 Nos. of electrical sockets (6 on each table) of IP 55 grade with splashproof box type covering of 230 volts, 13 Amp, 50Hz are required.</p>			
8.10	Laboratory Bench (01 Nos.)- (Q/R)-cont.	<p>Under bench cupboard and shelves (Min 3 cupboards and shelves for each) should be designed to utilize maximum storage capacity with minimal disturbance for leg space. All drawers and cupboards are lockable and have to be resistant to all kinds of chemical spills and water splashes.</p> <p>Two polypropylene molded sinks, made up of 5 mm thick high-density and elastic polypropylene with good resistance to organic solvents and corrosive</p>			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
		chemicals should be mounded on each bench. The faucet should be a 3-way type faucet and the bowl size of the sink should be clearly mentioned. 12 Nos. of electrical sockets (6 on each table) of IP 55 grade with splashproof box type covering of 230 volts, 13 Amp, 50Hz are required.			
8.11	Laboratory Bench (01 Nos. from each)- (T/U/V)	Each Bench top should be finished with materials resistant to heat, chemicals, moisture, and scratches: (Granite or Phenolic resins or feldspar) Worktop thickness should not be less than 18 mm The bench should be arranged as per the schematic diagram and the Structure should be steel box bar structure or c-frame structure. (Please note that both designs can be quoted for the single supplier as separate options) The under-bench welded units should be supported on heavy-duty steel frames fully carrying the load of worktops. All frame-work should be pre-treated with a superior pure epoxy powder-coated finish. Refer to the dimensions of the updated figure (Maximum tolerance for the dimensions is $\pm 10\%$). Under bench cupboard and shelves (Min 1 cupboard and shelves for each) should be designed to utilize maximum storage capacity with minimal disturbance for leg space. All drawers and cupboards are lockable and have to be resistant to all kinds of chemical spills and water splashes. 12 Nos. of electrical sockets (4 on each table) of IP 55 grade with splash proof box type covering of 230 volts, 13 Amp, 50Hz are required.			
8.12	Laboratory Chairs	18. Nos of laboratory chairs should be supplied.			
	Fume hood (01 Nos.)				
8.13	Country of origin	To be specified			
8.14	Manufacture	To be specified			
8.15	Manufacturer's Authorization Letter	The letter from the manufacturer should be attached			
8.16	Make/Model	To be specified			
8.17	Warranty period	Two years from the date of installation and commissioning			

Item No.	Features	Required Specification.	Tenderer's Specifications		
			Tenderer's Response		If 'No', Comments on the offer
			Yes	No	
8.18	After-sale service	Should provide			
8.19	External Dimensions	Min. 1200 (L) × 800 (W) × 2300 (H) mm			
8.20	Internal Dimensions	Min. 1000 (L) × 600 (W) × 1100 (H) mm			
8.21	Front Sash Opening	Max. 800 mm			
8.22	Air Velocity	Should be specified clearly			
8.23	Hood Material	Polypropylene			
8.24	Work Table Material	Should be durable materials with strong resistance to highly corrosive acids, load-bearing capacity, strong heat resistance, and scratch resistance. (Polypropylene/ Epoxy)			
8.25	Power Supply	220 V, 50 Hz Single phases			
8.26	Illumination	Min. 1000 Lux			
8.27	Other	Water, gas, and vacuum taps. Touched enable a fully controlled display system.			
8.28	Site Verification	Dimension of the spaces/tables in the figure should be physically verified by the supplier with relevant arrangements of electrical lines, water drains, ducting for fume hood, etc.			

2. Alternator coupled to diesel engine complete with.

- Control panel incorporating control, protection, monitoring/supervision systems.
- Automatic voltage regulating system.
- Set Mounted Generator circuit breaker.

3. Sound attenuation system

4. Generator control panel & remote monitoring system

5. Power breaker (3P)

6. Power and Control cables.

7. Automatic Changeover switches.

8. Warranty/ maintenance/ Spare Parts

3.1 General Requirements

The Diesel Generators shall be capable of automatic quick start upon receiving 'start' signal from relevant AMF/ATS and to switch on the full load.

Rated output power of individual diesel generator shall be not less than **440 kVA** at 0.8 power factor at generator output terminals. The unit shall be capable of delivering the rated output as per ISO8528 standard. It shall have full load capacity of 100% of the rated output for one hour during a period of 12 continuous hours operation.

The diesel generator sets shall be supplied complete with all ancillary equipment necessary for starting and running the set, including cooling system, fuel supply system, instrumentation, control and protection arrangements & cables,.

The bidder shall confirm that area allocated is sufficient for installation and proper functioning of the generators. Bidder may propose alternative arrangements based on existing site conditions

3.6 Engine Generator Set

3.6.1 General

The Generator set shall consist of diesel engine complete with radiator, exhaust system, governor, alternator with exciter and flywheel with flywheel housing, mounted on a steel base. The automatic voltage regulator may be mounted on the alternator. Generator control, protection, monitoring systems and accessories shall be mounted on a control panel. Generator set shall be factory assembled and aligned accurately on the steel base which shall be strong and rigid enough to ensure permanent alignment of all rotating units and prevent vibration build up and shall permit skidding in any direction during installation.

3.6.2 Engine-Generator Set – Ratings

Standby power Not less than the 440 kVA at 0.8 power factor Rated speed 1500 rpm

3.6.3 Engine-Generator Set Features

Generator set shall have the following features:

- Factory-mounted on a common, rigid, welded, structural steel base.
- Automatic start, accelerate to the rated speed and deliver the specified kW/kVA output at 50 Hz within 10 seconds.
- Recover rapidly from instantaneous changes between no load and the specified kW/kVA rating, and the reverse changes of load, without damage.
- Engine-generator set shall be statically and dynamically balanced at the factory.

3.6.4 Sound and Vibration Reduction

Flexible connection shall be provided to all exhaust, water, air, fuel and oil piping that leave the engine to prevent the transmission of vibration and the fracture of the piping due to movement of the set. The choice of connections and their installation is to be such as to give long life under normal operating condition of the set.

3.7.3 Exhaust System

Engine exhaust system shall be complete with a flexible section, a muffler and exhaust piping graded away from the engine to the outside. Exhaust system shall include heavy-duty industrial capacity critical type exhaust silencer and stainless steel exhaust bellows. The exhaust silencer and the exhaust piping shall be fully heat insulated with environmentally friendly lagging material. To release exhaust gases at appropriate elevation, additional exhaust pipes shall be supplied and installed. Material and diameter of the additional pipes shall be stainless steel, with same diameter as the engine manufacturer's standard exhaust pipes. The exhaust shall be extended up to 5m length.

3.7.4 Engine Starting System

The engine shall be equipped with an electronic starting system, which is arranged for fully automatic starting upon receiving the signal from AMF/ATS on failure of any phase of the main power supply.

Engine starting System shall start the engine at any position of the flywheel.

Electric cranking motor: Rating shall be adequate for cranking the cold engine at the voltage provided by the battery system, and at the required speed during five consecutive starting attempts of 10 seconds cranking each at 10 second intervals, for a total of 50 seconds of actual cranking without damage.

Batteries: 12 volt or 24 volt with the following features:

- Batteries shall be lead-acid type.
- Each battery cell shall have minimum and maximum electrolyte level indicators.
- Batteries shall have connector covers for protection against external short circuits.
- With the charger disconnected, the batteries shall have sufficient capacity so that the total system voltage does not fall below 85 percent of the nominal system voltage with the following demands:
 - Five consecutive starting attempts of 10 seconds cranking at 10 second intervals for a total of 50 seconds of actual cranking
- Battery racks shall be metal with an acid resistant finish and thermal insulation, and secured to the floor/unit.
- Battery shall operate continuously for 12 hours and be able to provide the cranking power described in above without charging.

- 4 **Battery Charger:** Charger shall be provided with both AC and DC transient protection. Charger shall be able to recharge a fully discharged battery without tripping AC protective devices. AC circuit breaker shall not trip under any DC load condition including short circuit on output terminals. The charger shall be capable of recharging the fully discharged battery in less than 12 hours and simultaneously power the Supervisory and Control panel. The charger shall have fused AC input and DC output protection, and shall not discharge the batteries when AC power fails.

4.7.1 Engine Filtration System

Shall consist of sealed paper mesh type dry air filters, cartridge type fuel filters and full flow lube oil filters. All filters shall have replaceable elements.

4.7.2 Lubricating System

Lubrication of the engine shall be by means of an engine driven integral pump. The pump shall have on the suction side a coarse strainer and on the delivery side a duplex 'full flow' fine filter complete with changeover cock incorporating pressure bypasses to facilitate oil flow to the engine should the filter become blocked. A permanently installed manual feed pump with necessary connections shall be provided to remove the lubricating oil from the engine sump during servicing.

4.7.3 Engine Protections:

The engine shall be provided with following protection devices for alarm and shutting down the engine automatically.

- (a) Low lubricating oil pressure
- (b) High cooling water temperature
- (c) Engine over speed
- (d) Over crank

4.7.4 Generator system protections:

- (a) Protection of over-current and short-circuit
- (b) Protection of emergency shut down

3.8 Alternator

3.8.1 Generator Alternator Parameters

Rated Output -	Not less than 440 kVA
Rated Power Factor -	0.8
Frequency -	50 Hz
Rated Voltage- 400/230 V, 3 phase & neutral Connection -	Three
phases & neutral star connected Insulation -	Class H

3.12 LV Power Cables

3.12.1 General

The cables shall be sized to comply with the regulations & applicable industrial standards.

3.12.2 Cables

LV power cable (02 Nos. of 185 mm² x 4C) required for connection from diesel generator to ATS panel shall be supplied and installed. LV power cable shall be of copper conductor, unless otherwise specified, XLPE insulated, PVC sheathed non armoured four-core cables and shall be of 600/1000 volt grade complying with BS 5467 or IEC 60502. Conductor size of the cable shall be decided by considering the total allowable voltage drop in the cable and current rating.

3.13 Miscellaneous

3.13.1 Maintenance

The Vendor should provide comprehensive maintenance for the warranty period of 2 years from the date of commissioning including all necessary parts and consumables including oil, lubricants etc. Additionally, submit the Maintenance agreement for 05 years after the first 02 years, in accordance with the Annex 02 (Maintenance Price Schedule Form). The total price of the maintenance price schedule shall not be included to the tender price. However, the total maintenance price shall be considered for tender evaluation.

3.13.2 Submittals

The following documents shall be submitted by the Contractor at the appropriate time.

A. Shop Drawings:

1. Sufficient information, clearly presented, shall be included to determine compliance with specifications.

B. Manuals:

1. Submit, simultaneously with the shop drawings, companion copies of complete maintenance and operating manuals of the engine generator set and auxiliaries including technical data sheets, wiring diagrams, and information, such as telephone number, fax number, and web sites, for ordering replacement parts.
2. Two weeks prior to the final inspection, submit four copies of the updated maintenance and operating manual to the Consultant Engineer:
 - a. Include complete "As installed" diagrams, which indicate all items of equipment and their interconnecting wiring.
 - b. Include complete diagrams of the internal wiring for each of the items of equipment, including "As installed" revisions of the diagrams.
 - c. The wiring diagrams shall identify the terminals to facilitate installation,

Annex - 02

Maintenance Price Schedule – After sales services

				Date:	
				Tender No:	
No.	Description	Unit	Qty	Rate (LKR/USD)	Amount (LKR/USD)
C	MAINTENANCE CHARGE				
	Supplier's Service contract Agreement should be submitted with the tender.				
1.0	1st year free maintenance period				
	Including maintenance and any Breakdown attend for one year.	Item	1.0		Free
2.0	2nd year free maintenance period				
	Including maintenance and any Breakdown attend for one year.	Item	1.0		Free
3.0	3rd year				
	The rates shall include for comprehensive maintenance (Including 2 nos. of maintenance per year) and any Breakdown attend for one year.	Item	1.0		
4.0	4th year				
	The rates shall include for comprehensive maintenance (Including 2 nos. of maintenance per year) and any Breakdown attend for one year.	Item	1.0		
5.0	5th year				
	The rates shall include for comprehensive maintenance (Including 2 nos. of maintenance per year) and any Breakdown attend for one year.	Item	1.0		
6.0	6th year				
	The rates shall include for comprehensive maintenance (Including 2 nos. of maintenance per year) and any Breakdown attend for one year.	Item	1.0		
7.0	7th year				
	The rates shall include for comprehensive maintenance (Including 2 nos. of maintenance per year) and any Breakdown attend for one year.	Item	1.0		
				Total Maintenance Price	

Name of Tenderer [insert complete name of Tenderer] Signature of Tenderer [signature of person signing the Tender] Date [insert Date]

Itemized Price Schedule for Lot 06 - Supply & Installation of Generator with Auto Transfer Switch (ATS) Panel

Item	Description	Unit.	Qty	Rate	Amount
				LKR/USD	LKR/USD
	The tenderer is advised to refer to the Drawings, Specifications, Condition of Contract, Special Conditions of Contract and other relevant documents prior to pricing of the following items.	Note			
	Rates in Price Schedule shall include all necessary materials (Cables, conduits, cable management systems, all required control cables etc.) and labour required to complete the generator installation to good working order.	Note			
	Except where specifically stated, all costs associated with provision of all holes, openings, chases, ducts and other builders' work required for installation shall be included in the rates.	Note			
	The tenderer shall submit the technical information and manuals etc.	Note			
	Testing and commissioning of the generator system shall be carried out by the supplier.	Note			
A	Generator with Auto Transfer Switch (ATS) Panel				
A1	Supply, Delivery to site a Sound proof 400 kVA Prime Powered Diesel Generator with MCCB.	Item			
A2	Supply and Installation of ATS facilities	Item			
A3	Installation of Generator complete with Control Panel, Inter connectin power cables(from gnerarot to ATS and ATS to incomer panel including accessories), Exhaust pipes (shall be extended upto 5m length), Generator Earthing, Control Cabling and other accessories as per specifications.	Item			
A4	Testing & Commissioning and Training of Purchaser's staff assigned for generator operation at the site.	Item			
Total Unit Price for Supply & Installation of Generator with Auto Transfer Switch (ATS) Panel (Excluding VAT)					