

To,  
Shaheed Mohtarma Benazir Bhutto,  
Institute of Trauma,  
Karachi

**FINANCIAL BID**  
**TENDER OF GENERAL ITEMS MACHINERY PARTS & PLANT & MACHINERY**  
**Tender Reference# PROC/SMBBIT/(OTHERS-02)/2023-24**  
**Due on 14-03-2024**

| S.#                                                                                       | Scope of Work                                                                                                                                                                                                                                                                                                                             | Qty | U.O.M | Unit Price         | Total Amount           |
|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|--------------------|------------------------|
| <b>SECTION A: GENERAL ITEMS</b>                                                           |                                                                                                                                                                                                                                                                                                                                           |     |       |                    |                        |
| 1                                                                                         | <b>Stainless Steel Racks Required for Operation Theater and CSSD</b><br>SS rack size 48"x18"x72" with 8 stages distance between each partition 8" maximum load capacity 1500kg<br>(same as existing or better)                                                                                                                            | 30  | Racks | Rs. 170000 /= Each | Rs. 5100000 /=         |
| 2                                                                                         | <b>Stainless Steel Racks Required for Operation Theater and CSSD</b><br>SS rack size 36"x18"x72" with 8 stages distance between each partition 8" maximum load capacity 1,000kg<br>(same as existing or better)                                                                                                                           | 20  | Racks | Rs. 160000 /= Each | Rs. 3200000 /=         |
| 3                                                                                         | <b>MS Storage Racks required for Stores</b><br>MS racks size 48" x 18" x 72" with 4 adjustable stages maximum load capacity 500kg<br>(same as existing or better)                                                                                                                                                                         | 50  | Racks | Rs. 100000 /= Each | Rs. 5000000 /=         |
| 4                                                                                         | <b>MS Heavy Duty Storage Racks required for Warehouse</b> MS racks size 108" x 24" x 84" with 3 adjustable pallets maximum load capacity 1000kg<br>(same as existing as warehouse racks or better)                                                                                                                                        | 80  | Racks | Rs. 140000 /= Each | Rs. 11200000 /=        |
| 9                                                                                         | <b>Instrument Trolleys</b><br>• Frame constructed of 2½cm stainless steel pipe<br>• Trolley fitted with stainless steel sheet shelves<br>• Shelves are 2cm recessed trays for safety of instruments<br>• Mobile on 75mm dia. Wheels<br>• Size: 43 x 73 x 82(H) cm<br>• ISO9001 & CE certified fabrication<br>(Same as existing at SMBBIT) | 20  | Nos.  | Rs. 90000 /= Each  | Rs. 1800000 /=         |
| 10                                                                                        | <b>Linen trolley with cover</b><br>(Same as existing at SMBBIT or better)                                                                                                                                                                                                                                                                 | 30  | Nos.  | Rs. 240000 /= Each | Rs. 7200000 /=         |
| 11                                                                                        | <b>Hampers trolley for soiled linen with cover</b><br>(Same as existing at SMBBIT or better)                                                                                                                                                                                                                                              | 20  | Nos.  | Rs. 30000 /= Each  | Rs. 600000 /=          |
| 31                                                                                        | <b>Laryngoscope Bulb</b>                                                                                                                                                                                                                                                                                                                  | 50  | Pcs.  | Rs. 1500 /= Each   | Rs. 75000 /=           |
| <b>Total Amount In Figure</b>                                                             |                                                                                                                                                                                                                                                                                                                                           |     |       |                    | <b>Rs. 34175000 /=</b> |
| <b>Total Amount In Words: Three Crore Forty One Lac &amp; Seventy Five Thousand Only.</b> |                                                                                                                                                                                                                                                                                                                                           |     |       |                    |                        |
| <b>Bid Security 5%</b>                                                                    |                                                                                                                                                                                                                                                                                                                                           |     |       |                    | <b>1708750</b>         |

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# HAQ ENTERPRISES

Medical Equipment, Furniture, Medicines And General Order Suppliers

**SCHEDULE OF REQUIREMENT/ BILL OF QUANTITIES (BOQ) OF  
PROCUREMENT OF GENERAL ITEMS MACHINERY PARTS & PLANT & MACHINERY  
Tender Ref. # PROC/SMBBIT/(OTHERS-02)/2023-24**

**SECTION A: GENERAL ITEMS**

| Item No. | Scope of Work                                                                                                                                                                                                                                                                                                             | Qty | UOM   | Make & Model | Unit Price | Total Price   |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|--------------|------------|---------------|
| 1        | Stainless Steel Racks Required for Operation Theater and CSSD SS rack size 48"x18"x72" with 8 stages distance between each partition 8" maximum load capacity 1500kg (same as existing or better)                                                                                                                         | 30  | Racks | Grateful     | 148,786.00 | 4,463,580.00  |
| 2        | Stainless Steel Racks Required for Operation Theater and CSSD SS rack size 36"x18"x72" with 8 stages distance between each partition 8" maximum load capacity 1,000kg (same as existing or better)                                                                                                                        | 20  | Racks | Grateful     | 119,786.00 | 2,395,720.00  |
| 3        | MS Storage Racks required for Stores MS racks size 48" x 18" x 72" with 4 adjustable stages maximum load capacity 500kg (same as existing or better)                                                                                                                                                                      | 50  | Racks | Grateful     | 47,786.00  | 2,389,300.00  |
| 4        | MS Heavy Duty Storage Racks required for Warehouse MS racks size 108" x 24" x 84" with 3 adjustable pallets maximum load capacity 1000kg (same as existing as warehouse racks or better)                                                                                                                                  | 80  | Racks | Grateful     | 149,786.00 | 11,982,880.00 |
| 5        | Vacuum Regulator with jar with lid having capacity of 1 liter auto-cleavable – Re-useable Warranty should be 1 year during maintenance period                                                                                                                                                                             | 150 | Racks | China        | 16,000.00  | 2,400,000.00  |
| 6        | Oxygen Flow meter wall type Warranty should be 1 year during maintenance period                                                                                                                                                                                                                                           | 300 | Pcs.  | China        | 6,200.00   | 1,860,000.00  |
| 7        | Oxygen Flow meter for cylinders                                                                                                                                                                                                                                                                                           | 100 | Pcs.  | China        | 6,200.00   | 620,000.00    |
| 8        | Lead Apron with Thyroid shield (Best Quality)                                                                                                                                                                                                                                                                             | 20  | Sets  | China        | 68,786.00  | 1,375,720.00  |
| 9        | Instrument Trolleys<br>Frame constructed of 2½cm stainless steel pipe<br>Trolley fitted with stainless steel sheet shelves<br>• Shelves are 2cm recessed trays for safety of instruments<br>• Mobile on 75mm dia. Wheels<br>• Size: 43 x 73 x 82(H) cm<br>ISO9001 & CE certified fabrication (Same as existing at SMBBIT) | 20  | Nos   | Grateful     | 33,786.00  | 675,720.00    |
| 10       | Linen trolley with cover<br>(Same as existing at SMBBIT or better)                                                                                                                                                                                                                                                        | 30  | Nos   | Grateful     | 27,786.00  | 833,580.00    |
| 11       | Hampers trolley for soiled linen with cover<br>(Same as existing at SMBBIT or better)                                                                                                                                                                                                                                     | 20  | Nos   | Grateful     | 27,786.00  | 555,720.00    |
| 14       | SpO2 probe adult for Infinium, OMNI 3                                                                                                                                                                                                                                                                                     | 70  | Pcs.  | China        | 6,400.00   | 448,000.00    |
| 15       | Reusable 5 channel leads ECG for Infinium, OMNI 3                                                                                                                                                                                                                                                                         | 40  | Pcs.  | China        | 11,000.00  | 440,000.00    |
| 16       | SpO2 Probe Peads for Infinium, OMNI 3                                                                                                                                                                                                                                                                                     | 20  | Pcs.  | China        | 6,600.00   | 132,000.00    |





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|                    |                                                                                     |     |      |       |           |                      |
|--------------------|-------------------------------------------------------------------------------------|-----|------|-------|-----------|----------------------|
| 17                 | Reusable NIBP cuff (Peads) single way without bladder for Infinium, OMNI 3          | 20  | Pcs. | China | 1,800.00  | 36,000.00            |
| 18                 | Reusable NIBP cuff (XL) single way without bladder for Infinium, OMNI 3             | 20  | Pcs. | China | 3,000.00  | 60,000.00            |
| 19                 | SpO2 probe paed for Nihon kohden Monitor                                            | 20  | Pcs. | China | 6,600.00  | 132,000.00           |
| 20                 | Nozzle connector b/w Hose pipe and cuff for Infinium, OMNI 3, Nihon kohden & Medec. | 200 | Pcs. | China | 6,900.00  | 1,380,000.00         |
| 21                 | Reusable NIBP cuff (Adult) single way tube without bladder for Infinium, OMNI 3     | 80  | Pcs. | China | 1,800.00  | 144,000.00           |
| 23                 | SpO2 probe adult for BLT, V6                                                        | 30  | Pcs. | China | 16,000.00 | 480,000.00           |
| 24                 | SpO2 probe paed for BLT, V6                                                         | 10  | Pcs. | China | 16,000.00 | 160,000.00           |
| <b>GRAND TOTAL</b> |                                                                                     |     |      |       |           | <b>32,964,220.00</b> |



*By [Signature]*

*Dr. Yusuf*

*[Signature]*

SECTION C: PLANT & MACHINERY:

| S. NO.                  | Scope of Work                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Qty   | UOM  | Unit Price   | Total Price                |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|--------------|----------------------------|
| A                       | Supply, erection, connecting, testing and commissioning of 1400 KVA Standby, 1250 KVA Prime Power, 400/230 V, 50 Hz 3 Phase, 1500 RPM, 0.8 PF 4-Wire, neutral grounded Diesel Generator Set                                                                                                                                                                                                                                                                            | 2     | Nos. |              | 80,500,000/- 161,000,000/- |
|                         | making necessary arrangement with the existing distribution system complete with M S Base Frame, dat service fuel oil external storage tank of 2500 liter capacity, starting DC Batteries with heavy duty suitable battery charger, exhaust silencer, water cooled radiator, brushless alternator engine control panel, anti-vibration mounting, acoustic enclosure, complete as specification.<br>Country of Origin: USA, Western Europe Chinese make not acceptable. | 1     | L/S  | 55,500,000/- | 55,500,000/-               |
|                         | Renovation of Powerhouse<br>Renovation of Powerhouse with all aspects<br>Complete soundproofing of Powerhouse<br>complete paint job                                                                                                                                                                                                                                                                                                                                    | 1     | L/S  | 4,750,000/-  | 4,750,000/-                |
|                         | Shifting of Materials/Equipment<br>Transportation & shifting of existing Genset & other materials to the other location within the city                                                                                                                                                                                                                                                                                                                                | 1     | L/S  | 7,855,000/-  | 7,855,000/-                |
| Technical Specification |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Total |      |              | 229,105,000/-              |
| 1                       | Engine                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |      |              |                            |
|                         | 1 Perkin / Caterpillar / Cummins                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |      |              |                            |
|                         | UK,USA / European origin                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |      |              |                            |
|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |      |              |                            |
|                         | Alternator Stamford, Leroy-somer                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |      |              |                            |
|                         | 2 UK, USA, European based or equivalent from the same origin                                                                                                                                                                                                                                                                                                                                                                                                           |       |      |              |                            |
|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |      |              |                            |
|                         | 3 COUPLING                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |      |              |                            |
|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |      |              |                            |
|                         | 4 Generator assembled by                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |      |              |                            |
|                         | 5 Output frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |      |              |                            |
|                         | 6 Rated speed                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |      |              |                            |
|                         | 7 Prime power                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |      |              |                            |
|                         | 8 Standby power                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |      |              |                            |
|                         | 9 Rated voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |      |              |                            |
|                         | 10 Power factor                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |      |              |                            |
|                         | 11 Nominal frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |      |              |                            |
|                         | 12 Voltage regulation (Max.)                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |      |              |                            |
|                         | 13 Steady speed droop(%)                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |      |              |                            |
|                         | 14 Exciter type                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |      |              |                            |
|                         | 15 Class of Insulation                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |      |              |                            |
|                         | 16 Gen set Controller module                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |      |              |                            |
|                         | 17 Protection grade                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |      |              |                            |
|                         | 18 Speed governor                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |      |              |                            |
|                         | 19 Cooling system                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |      |              |                            |





|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |      |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------|--|--|
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Radiator fan and belt drive Fan and belt guard<br>Coolant drain line with valve<br>Coolant level sensor with water level switch/ indicator Max. water temperature at load<br>Outlet water temperature Thermostat temperature range<br>Automotive Battery Charger<br>Gel Type With 900 CCA (3 Years Warranty)<br>Overload shutdown Short circuit shutdown<br>Low oil pressure shutdown Under & Over speed shutdown Under & Over voltage shutdown<br>Over winding temperature shutdown<br>Phase sequence, Phase Failure monitoring and tripping Under & Over Frequency Monitoring and tripping Reverse Power Monitoring and tripping<br>Voltmeter Frequency meter Ampere meter<br>Hour meter, KWH Meter Alarms and faults<br>Oil pressure gauge Water temperature gauge Battery voltage & Fuel level<br>Heavy duty fabricated steel skid type based frame with anti- vibration mounting /Isolators, Engine and alternator shall be mounted on a same frame steel skid. Built-in damper for anti-vibration<br>Two The bidder is to provide all OEM recommended parts including consumables (excluding Oil and Coolant) Required for schedule maintenance / operation for first 8 Service (minimum up to 2000 running hours of operation) of the equipment but not limited to the following<br>1. Oil Filter (8 sets)<br>2. Fuel Filter (8 sets)<br>3. Water Separator (8 sets)<br>4. Air Filter (2 sets)<br>5. Fan Belt (2 sets)<br>6. Genuine AVR (1 set)<br>Two year or 4000 working hours which one is earlier from the date of testing and commissioning |   |      |  |  |
|   | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Battery Charger                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |      |  |  |
|   | 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Batteries                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |      |  |  |
|   | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Engine Protections                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |  |  |
|   | 23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Metering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |      |  |  |
|   | 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Generator Frame                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |      |  |  |
|   | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Parts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |      |  |  |
|   | 26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Warranty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |      |  |  |
|   | Note: Vendor has to provide Operation & Maintenance during "Maintenance Period" of 24 months after completion of job in all respects, including manpower deployment with existing manpower of the Institute and providing them all operational trainings of the system and replacement or repairing of spare parts and consumables along with periodic servicing during maintenance period as per manufacturer operational manuals of equipment and required applicable standards all necessary drawings & its software access after the supply. Installation and commissioning, at no extra cost. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |      |  |  |
| 2 | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Fabrication, providing, installation and testing of synchronizing and AMF/ATS panel including all safeties to control 04 Nos. Generating sets as per load requirement with attached drawings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1 | Nos. |  |  |
|   | Technical Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |      |  |  |
|   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Refurbishment/Upgrading of Existing LV Panels:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |      |  |  |

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|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----|--|--|
|     | <p>Study the existing panels, specify components/parts to be refurbished, retained or be upgraded in view of the addition of the Diesel generators for parallel operation and execute all the works. The Work shall include Testing, and commissioning of existing Synchronizing and AMF / ATS Panel installed at site, complete in all respects with arrangement and replacement of required spare parts.</p> <p>The Automatic synchronization system contains all necessary functions for protection and control of the 4 Nos. Gen-set in parallel with KE by providing provision of Grid synchronization and soft changeover mechanism complete in all respects as per required applicable standards. It also contains all necessary 3-phase measuring circuits and all values and alarms are presented on the LCD display.</p> |   |     |  |  |
| 1.1 | Supply, installation, testing and commissioning of Auto Synchronization module which is capable to synchronize all the Gen sets of following capacities 4 Nos. 1250 kW Diesel Gen Set.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1 | Job |  |  |
| 1.2 | Supply installation, testing and commissioning of Control wiring & Containment between DG Set + Synch Module and synch Module on already provided ACB's inside enclosure or LV Panel with other accessories for DG sets system for Auto Synchronizing, Load Sharing and Load Management facilities. The Synch. Modules shall be enclosed in already provided Panel with ventilation fan. Complete in all respect.<br>Note: The existing panel size on site is 1800mmx750mmx800mm                                                                                                                                                                                                                                                                                                                                                   | 1 | Job |  |  |
| 1.3 | Supply & Installation of motor mechanism, UVT and Shunt coil for LV breaker which is already installed in existing LV Panel. The Contractor / Vendor shall also provide the services for existing breakers before energizing.<br>Note: The already installed Merlin Gerin ACB capacity is 1600A &, model No is M20 HI.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1 | Job |  |  |
| 1.4 | Supply, termination and laying of all required control cable will be supply by vendor. Control cables will be laying through already installed cable trays.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1 | Job |  |  |
| 1.5 | Supply installation, testing and commissioning of Bus Bar link to ACB. The Bus Bar shall be consist of 99.99% imported Copper of appropriate rating to meet the designed load requirement of 6300A including all safeties to be connected with existing busbar, Complete in all respect as per Standard.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1 | Job |  |  |
| 2   | The Contractor shall arrange the temporary connection between Incoming Busway and Outgoing Busway of Diesel Genset # 02 while working on Synchronizing panel and replacing its bus bar as per required applicable standards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 | Job |  |  |
| 3   | De-termination of existing cables installed from Diesel Gen Set # 01 to LT panels and handover to client.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1 | Job |  |  |
| 4   | Interconnection between Busways and 02 Nos. of Diesel Gen, Sets using 99.99% Imported Copper bus bars links and appropriate measures and materials as per required applicable standards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1 | Job |  |  |
| 5   | Interconnection between Busways and 04 Nos. of Diesel Gen. sets using 99.99% Imported Copper bus bars links and appropriate measures and materials as per required applicable standards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1 | Job |  |  |
| 6   | Interconnection between Busways and SYNCHRONIZING and AMF / ATS Panel using 99.99% Imported Copper bus bars links and appropriate measures and materials as per required applicable standards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1 | Job |  |  |
| 7   | Interconnection between Busways and Main LT Panels (Load Bus 1, Load Bus 2, Load Bus 3) placed in Electric room using 99.99% Imported Copper bus bars links and appropriate measures and materials as per required applicable standards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1 | Job |  |  |
| 8   | Complete System Quality inspection & check from a reputable recognized third-party vendor having experience of working in Generators, Switchgear and Synchronization Panel, during and after completion of all the works and before starting/energizing the system. Third-party inspection report must cover all the technical details of design & system compatibility and material quality after performing the required tests as per standards and payment will be made after submission of satisfactory compliance report with installation and completion report. Third-part inspection vendor must be registered and recognized with EIS or any other regulatory authority.                                                                                                                                                  | 1 | Job |  |  |
| 9   | Operation & Maintenance during "Maintenance Period" of 24 months after completion of job in all respects, including manpower deployment with existing manpower of the Institute and providing them all operational trainings of the system and replacement or repairing of spare parts and consumables along with periodic servicing during maintenance period as per manufacturer operational manuals of equipment and required applicable standards, at no extra cost.                                                                                                                                                                                                                                                                                                                                                           | 1 | Job |  |  |
| 10  | <p><b><u>SCOPE OF WORK</u></b></p> <p><b>Location of Site:</b><br/>2<sup>nd</sup> Floor of SMBB Institute of Trauma, Karachi</p> <p><b>Main Points of Contract:</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |     |  |  |



1. Bidders must carefully read all the details of this bidding document and may visit and inspect the existing generating and allied systems at his own expense and responsibility, prior to submission of tender. After submission of bid, he shall be liable to comply all the terms and conditions including but not limited to mentioned in this document and no claim whatsoever shall be entertained.
2. Re-modification, Balance Work, Testing, and commissioning with full functionalization of existing 2 Nos. Cummins DG Sets (1250kW each) and its allied accessories installed at site complete in all respects with spare parts arrangement and replacement including all safeties & monitoring accessories to control & measure operational parameters and ensure that these 02 Nos. DG sets 1250kW each is compatible for connecting with each other as per required applicable standards and also maintain suitable operational environment for these generators to work.
3. Supply, Installation, Re-modification, Balance Work, Testing, and commissioning with full functionalization of Synchronization module and existing SYNCHRONIZING and AMF / ATS Panel installed at site including wiring, components, all accessories etc. including panel modification required (if any), complete in all respects with spare parts arrangement & replacement and existing bus bar replacement with 99.99% Imported Copper busbar of appropriate rating to meet the designed load requirement of 6300A including all safeties & monitoring accessories to control & measure operational parameters of 4 nos. of generating sets (02 Nos. of Cummins DG Sets. & 02 Nos. of Newly installed Diesel Gen set, 1250kW each) in parallel with KE by providing provision of Grid synchronization and soft changeover mechanism as per required applicable standards. The synch module shall be capable of communicating with the already present generator synch panel. The panels must be properly earthed and earth testing report must be provided.
4. The contractor shall arrange OEM trained technical resource of sync modules and PLC system to ensure uninterrupted power supply during installation and commissioning activities.
5. Complete control & Power wiring including termination at both ends module to module, module to generator or wherever required will be in scope of works. Complete in all respects.
6. Arrangement of temporary interconnection between Incoming Busway and Outgoing Busway of Diesel Genset # 02 while working on Synchronizing panel and replacing its busbar to ensure system integrity and backup power availability during work as per required applicable standards.
7. De-termination of existing cables installed from Diesel Genset # 01 to LT panels and handover to client.
8. Interconnection between Bus ways and 04 Nos. of Diesel Gensets using 99.99% Imported Copper bus bars links and appropriate measures and materials as per required applicable standards.
9. Interconnection between Busways and SYNCHRONIZING and AMF / ATS Panel using 99.99% Imported Copper bus bars links and appropriate measures and materials as per required applicable standards.
10. Interconnection between Busways and Main LT Panels (Load Bus 1, Load Bus 2, Load Bus 3) placed in Electric room using 99.99% Imported Copper bus bars links and appropriate measures and materials as per required applicable standards.
11. Submission of manufacturer manuals, connection drawings, software, and programming manuals of all work after making them functional.
12. Submission of Copper certificate, breaker certificate, Synchronization module certificate, technical catalogues, component lists, Control drawings etc.



13. Submission of Third-party testing & inspection certificate.
14. Submission of operation & instruction manual, drawings and schematics in hardcopy and softcopy form detailing operating procedure and showing system failure scenarios of all equipment.
15. Supply, installation, re-modification, repairing, testing, and commissioning including transportation, shifting, and storing material at site, manufacturer manuals, drawings, submittals must be included in quoted price of all works & accessories, complete in all respects.
16. Repairing and shifting (as decided location) of existing Gen sets of 02 Nos. all the damages done to the building and existing system during work if any at no extra cost.
17. The contractor will do all the above work with his own forces and equipment.
18. The project will be on Turnkey basis which means that the contractor will be responsible for arranging all required items on its own including but not limited to batteries, sensors, even screws etc.
19. The essence of the contract is to ensure that the Diesel Generators Nos. 04 and Synchronization panel are functional and be able to run the desired load as mentioned in the specifications above all gen sets.
20. Operation & Maintenance during "Maintenance Period" of 12<sup>th</sup> months after completion of job in all respects, including manpower deployment with existing manpower of the Institute and providing them all operational trainings of the system and replacement or repairing of spare parts and consumables along with periodic servicing during maintenance period as per manufacturer operational manuals of equipment and required applicable standards, at no extra cost.

**Manufacturing Experience/Quality Assurance:**

Subject to compliance with the requirements of the Contract Documents, acceptable manufacturers are to be firms regularly engaged in manufacture of all material specified in this document, whose products have been in satisfactory use under similar service conditions for not less than ten years.

The manufacturer shall have more than 10 years' experience in the supply and installation of synch module for projects in Pakistan and must have a permanently residing team of certified technician available at site within 36 hours of complain.

**LV Switchgear Panel/Synchronization Panel:**

The Low Voltage Distribution Panels shall be completed in all respects with material and accessories, factory assembled, tested, and finished according to the Specifications and to the standard requirements.

The Low Voltage Distribution Panel shall:

- i. be front operation type,
- ii. be suitable for 400 Volts, 3 phase 4 wire, 50 Hz system,
- iii. be designed for flush mounting of all instruments on the front side,
- iv. have incoming and outgoing cable termination arrangement, terminal block/line up terminals,
- v. be provided with stainless steel name plate on the front side of door,
- vi. have all incoming and outgoing connections from top or bottom according to site requirements,

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- vii. have door grounded by flexible braided copper strip,
- viii. have wiring diagram in the pocket inside the door of Panel.
- ix. have hinged protective metallic door required with knob/handle.
- x. have cable hanging arrangement.
- xi. have all Adjustable Type breakers
- xii. have Control breakers (MCB Type)

All the components used in the Distribution panel shall be type tested and must comply with the requirements of applicable standards.

#### Components:

The Synchronization Panel shall be provided with components required for the satisfactory operation of the panel and of the electrical system and must comply with the requirements of applicable standards. Specifications of typical components which maybe included but not limited to are follows:

##### **i. Control module**

The synchronization control module monitors the generator and indicates operational status and fault conditions, automatically starting or stopping the engines smartly on demand load or fault conditions.

- a) Control module should have comprehensive load sharing capabilities with minimum configurable 12 inputs and 12 configurable outputs.
- b) It should have an ability to record the 500 minimum log events to facilitate easy maintenance.
- c) Control module should have an extensive numbers of fixed monitoring and metering and protection features are included as well as comprehensive communication and system expansion option.
- d) Module should have following key load share features:
  - Sequential set start.
  - Manual voltage/ frequency adjustment.
  - Automatic hour run balancing.
  - Dead bus sensing.
  - Bus failure detection.
  - Direct governor and AVR control.
  - Main (utility de-coupling test mode option.
  - It should have built-in reverse relay protection.
  - Flexibility to synchronies from Grid power
- e) RS485 remote communication ports should also be available with back lit LCD screen.
- f) Standard Features:
  - Voltage (L-L, L-N)
  - Current (Phase)
  - Average Volt, Amp, Frequency
  - kW, KVA, kVA (Average, Phase, %)
  - Power Factor (Average, Phase)
  - kW-hr, KVA-hr (total)
  - Generator stator and bearing temp (with optional module)





g) Generator Protection:

- Generator phase sequence
- Over/Under voltage (27/59)
- Over/Under frequency (81 O/U)
- Reverse Power (kW) (32)
- Reverse Reactive Power (KVAr) (32RV)
- Overcurrent (50/51)

h) Engine Monitoring:

- Coolant temperature
- Oil pressure
- Engine speed (RPM)
- Battery voltage
- Run hours
- Crank attempt and successful start counter
- Enhanced engine monitoring (with electronic engines)

i) Engine Protection

- Control switch not in auto (alarm)
- High coolant temp (alarm and shutdown)
- Low coolant temp (alarm)
- Low coolant level (alarm)
- High engine oil temp (alarm and shutdown)
- Low, high and weak battery voltage
- Over speed
- Over crank
- Low Oil Pressure

j) Control

- Run / Auto / Stop control
- Speed and voltage adjust
- Local and remote emergency stop
- Remote start/stop
- Cycle crank

k) Inputs & Outputs

- Two dedicated digital inputs
- Three analog inputs
- Six programmable digital inputs
- Eight relay out
- Two programmable digital outputs

l) Communications

- Primary and accessory CAN data links
- RS-485 annunciator data link
- Modbus RTU (RS-485 Half duplex)

ii. Bus Bars

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The Bus bars shall be imported, tinned, made of 99.9% pure Copper high conductivity including accessories like, Fischer plates, nuts & bolts, mounting accessories etc. complete in all respects, electrolytic tin plated copper and shall be completely isolated and mechanically braced for the specified fault level. The identification of bus bars shall be by providing heat shrink color coded sleeves on complete bus bar lengths and these shall be red, yellow, and blue for phases and black for neutral. The earth bus bar shall be green.

The bus bars shall be for three phases, neutral and earth and shall be of appropriate size to meet the electrical and mechanical requirements of the system and must be suitable for the designed load of 6300A. The temperature rise shall not exceed 45oC at rated current.

Imported Copper certificate shall be submitted with bill of lading. Imported copper shall be checked prior to the installation at site.

**iii. Digital Multimeter and Analyzers**

All meters shall be flush mounting, Digital type with built-in selector switches. The front dimensions shall be 96 x 96 mm for meters.

The meters shall be of accuracy class 1.5 The ammeter shall be suitable for connection to 5 Amps secondary of current transformers or directly through shunt. The ammeters and voltmeters shall have measuring range as per the panel in which meters are installed.

**iv. Current Transformers**

Current transformers shall be provided having suitable transformation ratio. The current transformers shall be of suitable burden having accuracy class 1.0 The current transformers shall have 5 amps secondary.

**v. Motorized/Manual Changeover Switches**

Changeover switch must have three stable positions, unaffected by voltage fluctuations and vibrations, protecting loads from network disturbances. It must be capable of safe on-load switching for any type of load such that with its on-load transfer capabilities, it is not necessary to isolate loads prior to transfer.

**vi. Electronic Voltage Relay**

The voltage relay monitors the over voltage and the under voltage and the phase sequence L1, L2, L3 in an alternating three phase mains. Adjustment range +20% - 20% of the nominal voltage.

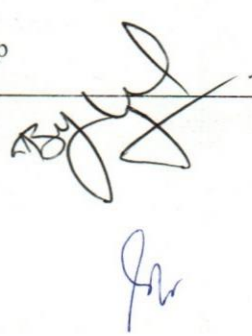
**vii. Air-Circuit Breaker**

TP ACB with Motorized Spring Charge mechanism, Tripping coil, shunt trip coil, & adjustable UVT and Overload, ground fault, instantaneous, long & short time protection

**Other possible components:**

**viii. Shunt Trip**

- Under Voltage Trip
- Motor mechanism





- Synchronizing Module
- Battery Charger
- Dry Batteries
- Digital Voltmeter + VSS
- Digital Ammeter + ASS
- CT's
- 14- Pin Relay with Base
- Indication Lights R, Y, B
- DP MCB
- TP MCB
- Control Fuses with Base
- Emergency Stop
- Key Switch
- Push Reset
- Panel Socket
- Panel Light with limit switch
- Louver, Exhaust Fan with Thermostat
- 2.5mm Line Up Terminal

#### Installation:

All screws, nuts and bolts used for fixing the distribution board shall be galvanized. The Panel installation shall include connecting all incoming and outgoing cables. The cable entry in the boards shall be provided from top or bottom as required. All labor, equipment and tools required for complete installation and shall be provided by the Contractor. All outgoing and incoming cable connections shall be made, and special care shall be taken in fixing cable boxes and in cable connections to have no danger of leakage during operation. Earthing connections shall be made with the existing earthing pits of generators made by the previous contractor. The installation work must comply with the requirements of applicable standards

#### Minimum Technical specifications of Synchronization Modules:

The synch controller modules must have the following minimum features but not limited to:

1. Expandable for both single and multiple gen-sets operating in standby or parallel modes.
2. Detachable modular construction for a variety of extension modules
3. Built-in synchronizer and load sharer to allow an integrated solution for gen-sets in standby, island parallel or mains parallel. Native cooperation of at least 4 gen-sets.
4. Able to support standard ECU types with future versions compatibility.
5. Ethernet and RS485 for remote internet connectivity.
6. Ability to connect with touch screen type HMI and/or other displays.
7. Capable of auto start load sharing, multi generator load share, mains control and bus-tie breaker control without need for separate control/automation PLC-based system
8. Should be able to synchronize both electronic and non-electronic gensets.
9. Automatically control change over from mains (utility) to generator supply or run generator in synchronization with the main (utility) to provide no-break operation.
10. Support of engines with ECU (Electronic Control Unit)
11. Integrated genset solution and signal sharing via CAN bus or similar protocol
12. Genset performance log
13. Built-in PLC (no external automation system or PLC required)
14. Separate TFT display
15. Configurable soft keys
16. Trends





17. Plug and play
18. Synch module and bus-tie module of same family/series
19. The synchronization control module monitors the generator and indicates operational status and fault conditions, automatically starting or stopping the engines smartly on demand load or fault conditions.
20. The synchronization control module must be able to run 1 generator for emergency load in case of synch failure.
21. It must have monitoring system on Modbus or TCP/IP which can be displayed on simple desktop PC via software provided along with modules.
22. Control module should have an extensive number of fixed monitoring and metering and protection features included as well as comprehensive communication and system expansion option.
23. Automatic synchronizing and power control (via speed governor or ECU)
24. Baseload, Import / Export, Temp by Power
25. Peak shaving
26. Voltage and PF control (AVR)
27. Generator measurement: U, I, Hz, kW, KVA, PF, kWh, kVAhr
28. Mains measurement: U, I, Hz, kW, KVA, PF
29. Inputs and outputs configurable for various customer needs
30. 1× RS232 / 2× RS485 / RJ-45 interface with Modbus support
31. Event-based history with customer-selectable list of stored values; RTC; statistic values
32. Interface to remote display units
33. USB slave interface

The synchronization module must comply with the requirements of applicable standards.

#### Proposed method of Performing Works:

The contractor is required to submit a narrative outlining the method of performing the Works. The narrative should indicate in detail and include but not limited to:

- i. The sequence and methods in which he proposes to carry out the Works, including the number of shifts per day and hours per shift, he expects to work.
- ii. A list of all major items of constructional and erection plant, tools and vehicles proposed to be used in carrying out the Works at Site, including number of each kind, make, type, capacity of all equipment, working condition, which shall be deployed by him for Electrical Work and Erection, Testing and Commissioning of the Works, in sufficient detail to demonstrate fully that the equipment and installation will meet all the requirements of the Technical Provisions.
- iii. Design drawings and operation scenarios of Synchronization panels and components which he proposes to use during the work.
- iv. The procedure for installation of equipment and transportation of equipment and materials to the site.
- v. Organization chart indicating head office & field office personnel involved in management, supervision, and engineering of the Works to be done under the Contract.
- vi. The contractor shall list in this Schedule the key personnel he will employ from Head office and from Site office to direct and execute the Works, together with their names, qualifications, experience, positions held and their nationalities.

The method must comply with the requirements of applicable standards.

#### Testing:

##### 1. Pre-Energization Third-party Inspection Certificate:





- i. Contractor will submit a list of at least 5 reputable, recognized third-party vendors engaged in supply, installation, testing & commissioning of Diesel Generators, Switchgears, and Synchronization panels & modules for last 10 years.
- ii. Client will choose a vendor from the contractor provided list. However, client has the right to include any other vendor name in the above list and choose other than the provided list, if deemed necessary.
- iii. The third-party vendor will thoroughly inspect & check all the works performed by the contractor as mentioned in this contract and will provide satisfactory certificate after performing the required tests as well in compliance with the requirements of applicable standards.
- iv. Third-party inspection report must cover all the technical details of design & system compatibility and material quality after performing the required tests in compliance with the applicable standards.
- v. The system will be energized after the obtaining of the above satisfactory certificate and the third-party vendor will be present at the time of energization.

**2. Pre-energization Check:**

Prior to energization, check all new and reused existing branch circuit cable, components, and wires for continuity of circuitry and for short circuits. Correct malfunction when detected.

**3. Voltage and Current Values:**

The voltage and current in each circuit shall be measured and recorded after all connections have been made and the circuit is under load.

**4. Earth Resistance Test:**

Earth resistance tests shall be made by the Contractor on the existing earthing system of Generators made by the previous contractor, separating and reconnecting each earth connection as required in compliance with the applicable standards.

**5. Submittals:**

Contractor shall furnish all instruments and personnel required for tests. Submit copies of certified test results and satisfactory certificates for review. Test reports shall include circuit tested, test type, date and time of test, test results, relative humidity, temperature, and weather conditions etc.

**Final Submissions:**

1. Contractor will submit operation, service & instruction manuals, drawings and schematics in hardcopy and softcopy form detailing operating procedure and showing system failure scenarios.
2. Manufacturer manuals of Generators and Synchronization panels & modules.
3. Single line diagram and layout of the complete power generation system.
4. Programming manuals, connection diagrams of Generators and Synchronization panels & modules showing & detailing operational & fault scenarios.
5. Copper certificate, breaker certificate, synch modules certificate and their catalogues, technical specifications, and company manuals.
6. As-built drawings showing all details including bus-bars arrangement and ratings/specifications.
7. Shop drawings, Isometric & disposed view of panels.
8. Technical catalogues of synchronization modules.
9. Component list of Synchronization panel.
10. Programming manuals & control drawings of synch panels and modules.
11. Testing, Commissioning, Monitoring, Installation & Completion report with Third Party Verification.
12. Earthing testing report of the system.
13. Any other necessary drawings, documents, manuals etc.
14. Magar testing report of the system.





Ref: TMK-FNC/0313/24

Date: 13.03.2024

## FINANCIAL OFFER

The Chief Operating Officer,  
SMBB Accident Emergency Trauma Center,  
Karachi

**SUBJECT: TENDER FOR THE PURCHASE GENERAL ITEMS FOR THE FINANCIAL YEAR 2023-24**

Respected Sir,

With the reference of your tender, our best financial offer as under.

| T.S #                           | Name of Items with Description                                                                                                                                                                                                                                                                                                     | Qty | U.O.M | Brand      | Unit Price | Total    |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------------|------------|----------|
| <b>SECTION A: GENERAL ITEMS</b> |                                                                                                                                                                                                                                                                                                                                    |     |       |            |            |          |
| 1                               | Stainless Steel Racks Required for Operation Theater and CSSD<br>SS rack size 48"x18"x72" with 8 stages distance between each partition 8"<br>maximum load capacity 1500kg<br>(same as existing or better)                                                                                                                         | 30  | Racks | Hi-Protect | 437,500    | 13125000 |
| 2                               | Stainless Steel Racks Required for Operation Theater and CSSD<br>SS rack size 36"x18"x72" with 8 stages distance between each partition 8"<br>maximum load capacity 1,000kg<br>(same as existing or better)                                                                                                                        | 20  | Racks | Hi-Protect | 237,500    | 4750000  |
| 3                               | MS Storage Racks required for Stores<br>MS racks size 48" x 18" x 72" with 4 adjustable stages maximum load<br>capacity 500kg<br>(same as existing or better)                                                                                                                                                                      | 50  | Racks | Hi-Protect | 70,000     | 3500000  |
|                                 | MS Heavy Duty Storage Racks required for Warehouse<br>MS racks size 108" x 24" x 84" with 3 adjustable pallets maximum load<br>capacity 1000kg<br>(same as existing as warehouse racks or better)                                                                                                                                  | 80  | Racks | Hi-Protect | 162,500    | 13000000 |
| 6                               | Oxygen Flow meter wall type<br>Warranty should be 1 year during maintenance period                                                                                                                                                                                                                                                 | 300 | Pcs.  | LifeCare   | 6,500      | 1950000  |
| 7                               | Oxygen Flow meter for cylinders                                                                                                                                                                                                                                                                                                    | 100 | Pcs.  | LifeCare   | 6,500      | 650000   |
| 8                               | Lead Apron with Thyroid shield<br>(Best Quality)                                                                                                                                                                                                                                                                                   | 20  | Sets  | Hi-Protect | 60,000     | 1200000  |
| 9                               | Instrument Trolleys<br>• Frame constructed of 2½cm stainless steel pipe<br>• Trolley fitted with stainless steel sheet shelves<br>• Shelves are 2cm recessed trays for safety of instruments<br>• Mobile on 75mm dia. Wheels<br>• Size: 43 x 73 x 82(H) cm<br>• ISO9001 & CE certified fabrication<br>(Same as existing at SMBBIT) | 20  | Nos.  | Hi-Protect | 87,500     | 1750000  |

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Cell: 0334-2081966

**Regional Office:**  
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# Parras ENTERPRISES

Deals In: Hospital Equipment, Institutional Pharmaceuticals  
Distributors & General Order Suppliers

Page 2 of 2

|    |                                                                                       |    |      |            |        |         |
|----|---------------------------------------------------------------------------------------|----|------|------------|--------|---------|
| 10 | Linen trolley with cover<br>(Same as existing at SMBBIT or better)                    | 30 | Nos. | Hi-Protect | 40,000 | 1200000 |
| 11 | Hampers trolley for soiled linen with cover<br>(Same as existing at SMBBIT or better) | 20 | Nos. | Hi-Protect | 46,250 | 925000  |
| 31 | Laryngoscope Bulb                                                                     | 50 | Pcs. | Hi-Protect | 1,200  | 60000   |
| 32 | Fiber Optic Laryngoscope Bulb                                                         | 50 | Pcs. | Hi-Protect | 1,725  | 86250   |

Terms & Condition:

Delivery: As per tender.

Val: As per tender.

If you have any question regarding our quoted items, please do not hesitate to contact us.

Looking for a long lasting relationship with you in future.

FOR,  
M/S PARRAS ENTERPRISES  
KARACHI



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