

KADAR HARGA PEMBAIKAN SISTEM BEKALAN ELEKTRIK(PENCAWANG ELEKTRIK DAN JANAKUASA TUNGGUSEDIA) DI UITM CAWANGAN SELANGOR KAMPUS PUNCAK ALAM DAN KAMPUS PUNCAK PERDANA SELAMA EMPAT(4) BULAN SELANGOR DARUL EHSAN.

BIL.	KETERANGAN KERJA	UNIT	KADAR HARGA (RM)
A	<u>11kV SWITCHGEAR</u>		
1	To supply, install, test and commissioning of:-		
	1) 12kV indoor Vacuum Circuit Breaker(VCB) 25kA 3 sec, 1250 with motorised spring charging mechanism and acc.	No.	.....
	2) Voltage Transformer 11kV/Rt3/110V/Rt3 Class 0.5, 100VA	No.	.....
	3) Ring Current Transformer 600/300/5A Class 5P20 15VA	No.	.....
	4) Ring Current Transformer 600/300/5A Class 1.0 15VA	No.	.....
	5) Padlockable Local Remote Selector Switch 3 Pole	No.	.....
	6) Padlockable Open neutral Close Selector Switch 2 Pole	No.	.....
	7) 3 Phase Power Digital Meter c/w communication facilities	No.	.....
	8) Indicating Light 30Vdc c/w bulb	No.	.....
	9) Indicating Light 110Vac c/w bulb	No.	.....
	10) Indicating Light 240Vac c/w bulb	No.	.....
	11) 240V AC 60/80Watt Anti Condensation Heater	No.	.....
	12) Thermostat	No.	.....
	13) Ammeter c/w selector switch	No.	.....
	14) Voltmeter c/w selector switch	No.	.....
	15) 11kV - 3 phase, 6A PT Fuse	No.	.....
	16) Phase Indication Light for cable	No.	.....
	17) 12kV Voltage Detector Insulator	No.	.....
	18) 12kV Bushing	No.	.....
	19) 12kV post Insulator	No.	.....
	20) 30/110Vdc Circuit Breaker Closing Coil	No.	.....
	21) 30/110Vdc Circuit Breaker Tripping Coil	No.	.....
	22) 30/110Vdc Motor Spring Charging for circuit breaker	No.	.....
	24) 1250A Busbar - 80mm x 20mm x 530mm	No.	.....
	25) Heat Shrink (Tubes/Sleeves) Cable	No.	.....
	26) Transformer guard Alarm	No.	.....
	27) Charge display device	No.	.....
	28) Circuit breaker contact:-		
	i) Male contact	No.	.....
	ii) Female contact	No.	.....
	29) 1 nos. Earthing Switch	No.	.....

2	To carry out site testing of 11kV VCB Switchgear:		
	1) Power frequency test of 11kV VCB	lot	.....
	2) Insulation test of 11kV VCB	lot	.....
	3) Ratio test of current transformer	lot	.....
	4) Winding resistance test of current transformer	lot	.....
	5) Circuit breaker timing test	lot	.....
	6) Contact resistance test of circuit breaker contact	lot	.....
	7) Vacuum check	lot	.....
	8) Pressure Test for 11KV 3 core underground cable	lot	.....
B	<u>BATTERY AND BATTERY CHARGER</u>		
1	To supply and install battery & battery charger :-		
	a) 30 VDC (Ni-Cad)/25 cell - Charger Output:30V/10Amps/40AH	Lot	.....
	b) 110 VDC (Ni-Cad)/92 cell - Charger Output:200AH/110V/10Amps	Lot	.....
2	To supply and install battery charger only :-		
	a) 110 VDC (Ni-Cad) /92 cell - 200AH at PPU 33kV	Lot	.....
	b) 30 VDC (Charger Output: 30Volts/10Amps/40AH.)	Lot	.....
3	To supply and install the following DC batteries only :-		
	a) 110 VDC (Ni-Cad)/200AH	per/cell	.....
	b) 30 VDC (Ni-Cad)/40AH	per/cell	.....
	c) 30 VDC (Dry Cell)/40AH	per/cell	.....
4	Membekal dan top-up air bateri.		
	i) Deionised Water (NiCad)	per/liter	.....
	ii) Distilled Water (Lead Acid)	per/liter	.....
5	Membekal dan menghantar air bateri.		
	i) Deionised Water (NiCad)	per/liter	.....
	ii) Distilled Water (Lead Acid)	per/liter	.....
6	To dismantle the existing battery charger / batteries.	Lot	.....
7	To carry out 110VDC batteries discharge test c/w report.	per/bank	.....

<u>C</u>	<u>TRANSFORMER</u>		
1	To supply, deliver, install, test and commission, 11 / 0.433 KV, DYN 11, 50Hz hermetically sealed, ONAN power transformer c/w transformer guard, alarm/trip circuit supervision and others accessories as following sizes :- b) 500KVA c) 750KVA d) 1000KVA e) 1250kVA f) 1500KVA g) 2000KVA	No. No. No. No. No. No.	
2	To supply, deliver, install, test and commission , 11 / 0.433 KV, DYN11, 50Hz 3 phase Cast Resin Transformer HV Copper Vacum Cast / LV Copper Vacuum Cast and others accessories. a) 1000KVA b) 1500KVA c) 2000KVA	No. No. No.	
3	To supply, install & commission of Transformer Guard Alarm at 11kV Oil Distribuion Transformer :- a) Winding Temperature b) Oil Temperature	No. No.	
4	To replace the existing faulty transformer's HV bushing. a) 300 - 500KVA b) 750KVA c) 1000KVA d) 1250KVA e) 1500kVA f) 2000KVA g) 10-30MVA	No. No. No. No. No. No. No.	

5	To replace the existing faulty transformer's LV bushing c/w gasket.		
	a) 300 - 500KVA	No.	
	b) 750KVA	No.	
	c) 1000KVA	No.	
	d) 1250kVA - 1500KVA	No.	
	e) 2000KVA	No.	
	f) 30MVA	No.	
6	To carry out Transformer Oil test comply with British Standard :-		.....
	a) Dielectric Breakdown	set	.....
	b) Moisture Content	set	.....
	c) Dissolved Gas Analysis (DGA)	set	.....
	d) Color	set	.....
	e) Acidity	set	
	f) Power Factor	set	
7	To replace the existing gasket transformer's at HV/LV bushing.		.....
	b) 750KVA	No.	.....
	c) 1000KVA	No.	
	d) 1250kVA	No.	
	f) 2000KVA	No.	.....
	g) 30MVA	No.	.....
8	Dry and filter transformer oil for transformer at temperature of not less than 70°C and pressure of not more than 5 Torr. Drying and filtering shall only be considered satisfactory from evidence shown on the usual resistance curve plotted during the process. The works will be carried on site.		
	b) 500KVA - 750KVA	No.	.....
	c) 1000KVA	No.	.....
	d) 1250KVA	No.	.....
	e) 1500KVA	No.	.....
	f) 2000KVA	No.	.....
	g) 30MVA	No.	.....

9	Replacement of Transformer gasket for transformer including gasket of all parts of transformer except tap-charger.		
	a) 300 - 500KVA	No.	.....
	b) 750 - 1000KVA	No.	.....
	c) 1000 - 1250KVA	No.	.....
	d) 1250 - 2000kVA	No.	.....
	e) 30MVA	Set	.....
10	To service Power Transformer 33KV Tap Changer.		
	1) TX no. 1 - TIRATHAI 30 MVA, 33/11kV	Set	.....
	2) TX no. 2 - ABB 10/12.5 MVA 33/11kV	Set	.....
11	To carry out site testing of 33/11kV, 30MVA Power Transformer:		
	a) Insulation resistance test	No.	.....
	b) Dielectric test	No.	.....
	c) Ratio test	No.	.....
	d) Winding resistance test	No.	.....
	e) Tangen Delta test	No.	.....
	f) Vector Group DYN11 test	No.	.....
	g) Polorization Index Test	No.	.....
12	To carry out site testing of 11/0.433kV Distribution Transformer:		
	a) Insulation resistance test	No.	.....
	b) Dielectric test	No.	.....
	c) Ratio test	No.	.....
	d) Winding resistance test	No.	.....
	e) Tangen Delta test	No.	.....
	f) Vector Group DYN11 test	No.	.....
	g) Polorization Index Test	No.	.....
13	To replace Transformer silica gel.	Kg.	.....
14	To supply and install cable bracket for Transformer Cable c/w accessories (HV/LV).	No.	.....
15	To supply and install an approved quality of transformer oil.		
	a) Per litre	litre	.....
	b) Per Drum (209 litre)	per/drum	.....

<u>D</u>	<u>11KV / LV CABLE WORK</u>		
1	HT CABLE FAULT		
	a) Cable fault location for 11KV underground cable.	L. Sum	.....
	b) Straight through joint c/w jointing kits and accessories for 11KV underground cable including excavation and back filling c/w testing and commissioning.		
	i) 3 core 150mm ² Aluminium XLPE / SWA / PVC.	L. Sum	.....
	ii) 3 core 240mm ² Aluminium XLPE / SWA / PVC.	L. Sum	.....
	iii) 3 core 150mm ² Copper XLPE / SWA / PVC	L. Sum	.....
	iv) 3 core 185mm ² Copper XLPE / SWA / PVC.	L. Sum	.....
	v) 3 core 240mm ² Copper XLPE / SWA / PVC	L. Sum	.....
	vi) 3 core 300mm ² Copper XLPE / SWA / PVC	L. Sum	.....
	vii) 1 core 500mm ² Copper XLPE / SWA / PVC	L. Sum	.....
	c) To install :-		
	i) Lay HV underground cable inclusive of joint, terminations, preparation of all joints pits.	L. Sum	.....
	ii) G.I / PVC pipe.	L. Sum	.....
	iii) Road reinstatement work using premix.	L. Sum	.....
	iv) HT Cable markers.	L. Sum	.....
	v) Make good and etc. as specified (excluding cable).	L. Sum	.....
	d) To carry out testing (Meggar & Pressure Test) and commissioning.	L. Sum	.....
2	LV CABLE FAULT		
	a) Cable fault location for LV underground cable	L.Sum	.....
	b) Straight through joint for LV underground cable c/w jointing box and accessories for underground cable include excavation of joint, terminations and reinstatement work.	L.Sum	.....
	c) To install :-		
	i) Lay LV underground cable inclusive of joint, terminations, preparation of all joints pits.	L. Sum	.....
	ii) G.I / PVC pipe.	L. Sum	.....
	iii) Road reinstatement work using premix.	L. Sum	.....
	iv) LV Cable markers.	L. Sum	.....
	v) Make good and etc. as specified (excluding cable).	L. Sum	.....
	d) To carry out testing (Meggar & Pressure Test) and commissioning.	L. Sum	.....

<u>E</u>	<u>SERVICES, TESTING AND CALIBRATION</u>		
1.0	To service :-		
	a) 11kV VCB Truck	No.	.....
	b) MSB(all range sizes)	No.	.....
	c) ACB (all range Amp)	No.	.....
	d) MCCB (all range Amp)	No.	.....
	e) Battery (all range)	No.	.....
	f) Capacitor bank(all range)	No.	.....
2.0	To carry out a 3 phase 1st trip 33/11kV breaker profile.	No.	.....
3.0	Calibration and setting of HV protection Relay.	Nos.	.....
4.0	Calibration and setting of LV protection Relay.	Nos.	.....
5.0	To carry out the Partial Discharge Test on HV panels c/w report.	per/panel	.....
<u>F</u>	<u>PROTECTION RELAY</u>		
1.0	To supply, install, test and commissioning the following HV and LV protection relay c/w associated assessories as follows :-		
	a) Mikro MK 2200/DELAB- OC & EF or equivalent.	no	.....
	b) Mikro MK 1000/DELAB - OC & EF or equivalent.	no	.....
	c) Mikro IDMT 202A/DELAB - O/C or equivalent.	no	.....
	d) Mikro IDMT 203A/DELAB - E/F or equivalent.	no	.....
	e) Mikro DT 204A - O/C or equivalent.	no	.....
	(f) Mikro DT 201A/DELAB - E/F or equivalent.	no	.....
	(g) Mikro ELR 301A/DELAB or equivalent.	no	.....
	(h) ZT CT	no	.....
	(i) ABB SPAJ 140C - O/C & E/F or equivalent.	no	.....
	(j) Toshiba Grd110 - O/C & E/F or equivalent.	no	.....
	(k) Reyrolle Sorkar R/Rf	no	.....
	(l) Gelpag MK2200 O/C & E/F	no	.....
<u>G</u>	<u>AIR CIRCUIT BREAKER(ACB)</u>		
1	To supply and install Air Circuit Breaker (35 -65kA) 415V at the Main Switch Board or Sub-Switchboard.		
	a) 630A - 800A TPN	No.	.....
	b) 1000A - 1200 TPN	No.	.....
	c) 1600A - 2000A TPN	No.	.....

	d) 2500A - 4000A TPN	No.	.....
	e) 600A - 2500A 4P & N	No.	.....
	f) 3000A - 4000A 4P & N.	No.	.....
H	<u>MOULDED CASE CIRCUIT BREAKERS (MCCB)</u> To supply Moulded Case Circuit Breakers (MCCB) of appropriate ratings for installation in Main Switchboard or Sub-Switchboard or Distribution Board.		
1.0	Kutub tunggal dan neutral dengan beban memutus 30kA		
	a) 30A sehingga 60A SPN	No.	.....
	b) 100A sehingga 150A SPN	No.	.....
2.0	Tiga Kutub dan neutral dengan beban memutus 25kA/30kA		
	a) 10A sehingga 30A	No.	.....
	b) 40A sehingga 150A	No.	.....
	c) 200A	No.	.....
	d) 250A	No.	.....
	e) 300A	No.	.....
	f) 350A	No.	.....
	g) 400A	No.	.....
	h) 500A	No.	.....
3.0	Tiga Kutub dan neutral dengan beban memutus 50kA		
	a) 30A sehingga 60A	No.	.....
	b) 100A sehingga 150A	No.	.....
	c) 200A	No.	.....
	d) 250A	No.	.....
	e) 300A	No.	.....
	f) 350A	No.	.....
	g) 400A/500A	No.	.....
	h) 600A	No.	.....
	i) 800A	No.	.....
I	<u>ISOLATOR</u> To supply and install one (1) metalcald isolator to BBS 861: Pt.1: 1955 or BSS 2510: 1954 for termination of single-phase or 3-phase 415 V, 4 wire power point, including provision of all necessary M.S. framework for installing the isolator in position, for each of the following ratings.		
	a) 60A T.P.N	No.	.....
	b) 100A T.P.N	No.	.....
	c) 150A TPN	No.	.....

J	<u>MINIATURE CIRCUIT BREAKERS (MCB)</u>		
	To supply Miniature Circuit Breaker (MCB) of appropriate ratings for installation in sub-switchboard or distribution board.		
	a) 6A S.P 2.5KA	No.	.....
	b) 10A S.P 2.5KA	No.	.....
	c) 5A S.P 4.5KA	No.	.....
	d) 20A S.P 4.5KA	No.	.....
	e) 32A S.P 6KA	No.	.....
K	f) 60A S.P 6KA	No.	.....
	<u>RESIDUAL CURRENT CIRCUIT BREAKER (RCCB)</u>		
	a) 32Amp, 100mA, 240 volt DP	No.	.....
	b) 40Amp, 100mA, 240 volt DP	No.	.....
	c) 63Amp, 300mA, 240 volt DP	No.	.....
	d) 32Amp, 300mA, 415 volt T.P.N	No.	.....
	e) 63Amp, 300mA, 415 volt T.P.N	No.	.....
L	f) 100Amp, 300mA, 415 volt T.P.N	No.	.....
	<u>CONTACTOR</u>		
	a) DP 20A AC 3	No.	.....
	b) DP 30A AC 3	No.	.....
	c) DP 40A AC 3	No.	.....
	d) DP 60A AC 3	No.	.....
	e) TP 30A AC 3	No.	.....
	f) TP 40A AC 3	No.	.....
	g) TP 60A AC 3	No.	.....
	h) TP 100A hingga 125A AC 3	No.	.....
	i) TP 130A hingga 150A AC 3	No.	.....
M	<u>TP & N DISTRIBUTION BOARD C/W INCOMING MCCB & ELCB</u>		
	a) 30A 6-way	No.	.....
	b) 30A 8-way	No.	.....
	c) 30A 10-way	No.	.....
	d) 30A 12-way	No.	.....
	e) 60A 8-way	No.	.....
	f) 60A 10-way	No.	.....
	g) 60A 12-way	No.	.....
	h) Add/deduct each unit way	No.	.....

<u>N</u>	<u>CAPACITOR BANK</u>		
	To supply and install:-		
1	<u>Capacitor (440V)</u>		
	a) 5 KVAR	No.	.....
	b) 10 KVAR	No.	.....
	c) 15 KVAR	No.	.....
	d) 20 KVAR	No.	.....
	e) 25 KVAR	No.	.....
	f) 30 KVAR	No.	.....
	g) 40 KVAR	No.	.....
	h) 50 KVAR	No.	.....
	i) 70 KVAR	No.	.....
	j) 100 KVAR	No.	.....

O	<u>CONTROL PANEL/AMF BOARD / MSB / SSB/ HV/LV PANEL</u>		
	To supply and install :-		
	1.0 Ammeter	No.	.....
	2.0 Voltmeter	No.	.....
	3.0 Frequency Meter	No.	.....
	4.0 KWH Meter	No.	.....
	5.0 HR Meter	No.	.....
	6.0 Selector Switch	No.	.....
	7.0 Indicator Light	No.	.....
	8.0 Push Button	No.	.....
	9.0 Emergency Stop Button	No.	.....
	10.0 Time Relay Switch	No.	.....
	11.0 Automatic Changeover Contactor	No.	.....
	12.0 Ring Current Transformer 1200/5A - 15VA	No.	.....
	13.0 Ring Current Transformer 800/5A - 15VA	No.	.....
	14.0 Power Factor Meter	No.	.....
	15.0 Power Meter	No.	.....
	16.0 Timer Switch 24 hours	No.	.....
	17.0 Metalclad board (standard size for TPN 30A - TPN 100A)	No.	.....
	18.0 Metalclad board (standard size for TPN 150A - TPN 300A)	No.	.....
	19.0 3 Phase Digital Power Meter c/w communication facilities	No.	.....
	20.0 Power Card:-		
	i) Converter Power Card AC/DC - 240Vac - 110Vdc	No.	.....
	ii) Converter Power Card AC/DC - 240Vac - 30Vdc	No.	.....
	21.0 O/C & E/F Prot. Test Terminal Block	No.	.....
	22.0 Pilot Wire Prot. Test Terminal Block	No.	.....
	23.0 Pilot Wire Prot. Relay(Solkor R/Rf) Reyrolle Siemens or equivalent	No.	.....
	24.0 Master Lockout Trip Relay	No.	.....
	25.0 Remote/Superv. Selector Switch	No.	.....
	26.0 Master Trip Relay	No.	.....
	27.0 PATC Auto Trip Counter	No.	.....
	28.0 PMTC Hand Trip Counter	No.	.....
	29.0 Pilot Wire Superv Receive End Seimens or Equivqlent	No.	.....
	30.0 Pilot Wire Guard Relay(TOSHIBA) or equivqlent	No.	.....
	31.0 Selector switch VCB In service/Isolate	No.	.....
	32.0 Selector CCT Breaker Discrepancy	No.	.....
	33.0 Earth Switch	No.	.....

	34.0 Heater ON/OFF Switch	No.	.....
	35.0 AC Socket	No.	.....
	36.0 Test Block Metering	No.	.....
	37.0 Ammeter Selector Switch	No.	.....
	36.0 PDPM Digital Power Meter	No.	.....
P	<u>LIGHTNING PROTECTION ACCESSORIES</u>		
	To supply, install and commission the following items of equipment and accessories as specified:-		
	a) 25mm x 3mm copper tape per metre run.	No.	.....
	b) 25mm x 3mm copper tape in concealed 38mm dia. PVC conduit - per metre run.	No.	.....
	c) Air terminal, 15mm dia.	No.	.....
	d) Air termination saddle	No.	.....
	e) Junction Clamp	No.	.....
	f) Penyambungan Ujian(Test Joint)	No.	.....
	g) Ruang pemeriksaan konkrit pratuang dengan penutup boleh tanggal/pasang jenis tahan lasak(heavy duty)	No.	.....
Q	<u>EARTHING</u>		
	To supply, install and connect-up the following items of equipment and materials to be utilized in earth electrode systems for electrical and lightning prevented systems, complete with all necessary accessories to effect complete installation and connection in each case :-		
	a) Bare, copper earth-continuity tape, 25mm x 3mm (1" x 1/8") cross section, surface-run on all or steelwork, per metre run c/w accessories.	/meter	.....
	b) As per item (a) above, but installed in G.I conduit and buried to a depth of 600mm (2'0") below finished ground level, per metre run	/meter	.....
	c) 20mm (5/8") dia. Copper(gred A) or steel cored copper, extensible earth electrode of specified type, c/w brass or copper connection clamp, brass sleeve coupling for extending depth of electrode to achieve less 3 ohm.	No.	.....
	d) R.C. Inspection Chamber with removable cover for earth electrode connection point, each (12" x 12" x 8")	No.	.....
	e) As per item (d), but Inspection Chamber and cover made from mil-steel plate, each (12" x 12" X 8")	No.	.....
	f) To carry out grounding system testing of the following method:-		
	a) Fall of Potential Method or 3 - Point Test	LS	.....
	b) Induced Frequency test or clamp - on method.	LS	.....

<u>R</u>	<u>MISCELLANEOUS MATERIALS & EQUIPMENT</u>		
1.0	<u>ROAD CROSSING CABLE DUCT</u> Rates shall also include for the trenching across the road and under roadside drains to lay ducts the reinstatement of bitumen road surface, the provision of cable draw-wire through and the sealing of ducts after cables are laid, g.i.pipe(class B):- a) 100mm dia G.I pipe ducts b) 150mm dia G.I pipe ducts c) 200mm dia G.I pipe ducts d) 250mm dia G.I pipe ducts e) 300mm dia G.I pipe ducts f) 350mm dia G.I pipe ducts g) 400mm dia G.I pipe ducts	Per Meter Per Meter Per Meter Per Meter Per Meter Per Meter Per Meter	..... ..... ..... ..... ..... ..... .....
2.0	To supply and install the following items :- a) LED Fluorescent lamp 36W b) 13Amp socket outlet (metaclad) c) Exhaust fan :- i) 12" ii) 16" iii) 20" iv) 24" d) Wall mounted Industrial fan 24" e) Emergency light i) 18W ii) 36W f) Wiring c/w conduit and accessories i) 1.5mm ² PVC cables + ecc. ii) 2 x 1.5mm ² PVC cables + ecc. ii) 2.5mm ² PVC cables + ecc. ii) 2 x 2.5mm ² PVC cables + ecc.	No. No. No. No. No. No. No. No. meter meter meter meter	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....
3.0	To supply and install, one (1) of each of the following time switches for lighting points or control circuits:- a) 10A, D.P., time switch with spring reserve as specified, for installation in panel or switchboard b) 20A, D.P., time switch with spring reserve as specified, for installation in panel or switchboard c) 30A, D.P., time switch with spring reserve as specified, for installation in panel or switchboard	No. No. No.	..... ..... .....

4.0	To supply and install, one (1) S.P. or three phase surface-mounted. Galvanized weatherproof with cover type or approved equivalent make, for the following types:- a) Heavy duty type 15A with 24 hour working reserve b) Heavy duty type 20A with 8½ hour working reserve. c) Heavy duty type 30A with 8½ hour working reserve.	No. No. No.	..... ..... .....
5.0	To supply and install the following : a) To display 'Single Line Diagram' with Aluminum frame b) Regulation-type, "DILARANG MASUK" notice plate each. c) Regulation-type, "BAHAYA" plate each d) Regulation-type, CPR Board each c/w Aluminium frame e) 6' (LT) X 2'(W) X 3/8"(D) Rubber Matt for Main Switchboard or Control Panel. f) Regulation-type, "NO ADMITTANCE" notice plate each. g) Regulation-type, "UTAMAKAN KESELAMATAN" notice plate each.	No. No. No. No. No. No. No.	..... ..... ..... ..... ..... ..... .....
6.0	To produce single line/schematic drawing for substation.	per drawing	.....
7.0	To produce layout drawing for substation.	per drawing	.....
8.0	To scan HV / LV equipments in substation using Infrared Thermography Cam. and endorsed by Service Engineer (Certificate Thermographer) c/w report:- 1.1 Switchgear/VCB. 1.2 Transformer 11KV(2500 - 300KVA) 1.3 Transformer 33KV(10 -15MVA) 1.4 Main Switch Board(MSB). 1.5 Busduct di Pencawang Elektrik. 1.6 Sub Switch Board(SSB) 1.7 Fedeer Pillar	per/panel per/panel per/panel per/panel per/panel per/panel per/panel	..... ..... ..... ..... ..... ..... .....
9.0	To scan HV equipments in substation using Ultrasonic Sound services on HV panels c/w report.and endorsed by Service Engineer (Certificate Thermographer) c/w report:- 3.1 Transformer 10-30MVA 3.2 Transformer 300KVA - 2500KVA	per/panel per/panel	..... .....
11.0	To supply & Install FLIR IR Windows unit in substation specifications : 4.1 Model number : FLIR IR Window 2"-IRW-2C 4.2 Model number : FLIR IR Window 3"-IRW-3C 4.3 Model number : FLIR IR Window 4"-IRW-4C	1 lot 1 lot 1 lot	..... ..... .....

S	<u>SURGE PROTECTION DEVICE(SPD)</u>		
	To supply, install and commission the following items of equipment and accessories as specified:-		
	a) Transient voltage and lightning protection surge arrester/ type 1 max, 255V, 50 - 125kA	no.	.....
	b) Type 1 surge arrester / N-PE max. 280 V, 50 kA / V 50-B series.	no.	.....
	c) Type 2 surge arrester max. 150 V, 20kA / V 20 - C series.	no.	.....
	d) Type 2 surge arrester / compact 150 - 385 V, 10kA / V 10 series.	no.	.....
	e) Type 3 surge arrester / plug - in.	no.	.....
	f) Transient voltage and lightning protection surge arrester/ type 3 12 - 255 V/VF series.	no.	.....
T	g) Type 1 surge arrester/ for photovoltaic application 600 - 1000V, 12.5 - 50 kA / V 50 series.	no.	.....
	<u>SURGE SUPPRESSOR</u>		
	1.0 Lightning Horn Surge suppressor - Protection against true lightning of 10/350 us waveform. - 250kA of 10/35us lightning surge capability. - 880V protection on 10/350 us. - No welding U18 S/F limiter. - Match with MSB short circuit fault level, 20MVA or up to 43kA - Match to TNB utility safety standards, TT system. - Incorporate with Precision Power Lightning Surge Monitoring LSM	LS	.....
	2.0 Extra Fine Surge Suppressor - 90kA of 8/20 us surge capability. - 550V protection level. - 7 mode, LL600, LN 550, FM remote features monitoring LSM.	LS	.....
	3.0 Series Surge Suppressor - Precision Transient Tracking of bidirectional modes. - Up to 60dB surge attenuation. - 5 times overload protection. - Visual and remote monitoring features. - Incorporate "Surge Diverter" B100/C175	LS	.....
	4.0 Combined Power Surge Suppressor - 150kA of 10/350 us lightning surge capability. - 120kA of 8/20 us surge capability. - Non welding U18/F limiter - Incorporate with Precision Power Lightning Surge Monitoring, LSM.	LS	.....
	5.0 Data Line Surge Suppressor - Precise - tel 10kA datacomn protection. - 3 stage protection technology, bil-directional mode, pluggable modular. - Proven in server and expose site.	LS	.....
	6.0 Coaxial Surge Suppressor - Precise-tel 10kA surge capability & suitable for any video equipment & exposes sites.	LS	.....

U	LED INDICATION LIGHT		
	a) 240Vac LED Indication Light	no	.....
	b) 110Vac LED Indication Light	no	.....
	c) 30Vac LED Indication Light	no	.....
	d) 24Vac LED Indication Light	no	.....
V	<u>CABLE AND CABLE TERMINATION</u>		
	Supply and install the following types off cables either in conduit, trunking, cable tray or lay direct in the ground. (Note: Rates to include all necessary cable cleats, saddles and accessories but EXCLUDING CONDUIT, TRUNKING, CABLE TRAY AND TRECHING, WHICH SHALL BE MEASURED SEPARATELY). Cable termination shall include provision of cable lugs, termination glands or cable end boxes.		
	1.0 PVC Cable (0.6/1kV). Copper.		
	a) 1 x 50 sq.mm	P/Mtr	.....
	b) 1 x 70 sq.mm	P/Mtr	.....
	c) 1 x 95 sq.mm	P/Mtr	.....
	d) 1 x 150 sq.mm	P/Mtr	.....
	e) 1 x 185 sq.mm	P/Mtr	.....
	f) 1 x 240 sq.mm	P/Mtr	.....
	2.0 PVC /SWA/PVC Cables (0.6 / 1 kV) Copper		
	a) 2c-2.5 sq.mm each	P/Mtr	.....
	b) 2c-4 sq.mm each	P/Mtr	.....
	c) 4c-4 sq.mm each	P/Mtr	.....
	d) 2c-6 sq.mm each	P/Mtr	.....
	e) 4c-6 sq.mm each	P/Mtr	.....
	f) 2c-10 sq.mm each	P/Mtr	.....
	g) 4c-10 sq.mm each	P/Mtr	.....
	h) 2c-16 sq.mm each	P/Mtr	.....
	i) 4c-16 sq.mm each	P/Mtr	.....
	j) 2c-25 sq.mm each	P/Mtr	.....
	k) 4c-25 sq.mm each	P/Mtr	.....
	l) 4c-35 sq.mm each	P/Mtr	.....

	3.0 XLPE / SWA / PVC (0.6 / 1 kV) Copper a) 4c-35 sq.mm each b) 4c-50 sq.mm each c) 4c-70 sq.mm each d) 4c-95 sq.mm each e) 4c-120 sq.mm each f) 4c-150 sq.mm each g) 4c-185 sq.mm each h) 4c-240 sq.mm each i) 4c-300 sq.mm each 4.0 PVC/ SWA / PVC(0.6 / 1 kV) Aluminium a) 1c - 500 sq.mm each 5.0 FIRE RESISTANT(FR) CABLE(0.6/1KV, COPPER a) 50 . Sqmm 1C XLPE/PVC/SWA b) 70 . Sqmm 1C XLPE/PVC/SWA c) 95 . Sqmm 1C XLPE/PVC/SWA d) 120 . Sqmm 1C XLPE/PVC/SWA e) 150 . Sqmm 1C XLPE/PVC/SWA f) 180 . Sqmm 1C XLPE/PVC/SWA 6.0 To terminate, test and commission new 11kV Power Cable, 3C, 11kV XLPE cable to 11kV VCB Panel c/w cable bracket and accessories as following sizes :- a) 3c-95 sq.mm each b) 3c-150 sq.mm each c) 3c-185 sq.mm each d) 3c-240 sq.mm each e) 3c-300 sq.mm each f) 3c-400 sq.mm each 7.0 To do utilities mapping for rod lay cable include backhoe if necessary c/w drawing and endorsement. 8.0 To do HDD for rod cable c/w PN10 or use manual digging	P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr P/Mtr L.Sum L.Sum L.Sum L.Sum L.Sum L.Sum 1 Lot 1 KM	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....

W	<u>LAIN-LAIN BERKAITAN</u> 1.0 Personal Protective Equipment(PPE) Level 4(33KV) ARC Flash Protection Kit set for HT switching purposed as required by Energy Comission(Suruhanjaya Tenaga):- 1.1 33 KV GIS Switcgear Outer Layer : Style 851 Sateen Inner Layer 1 : Style 851 Sateen Weight : 18.0 oz/sq yd2(610g) Fabric Bled : 87% Cotton, 12% High Tenacity Nylon and 1% Antistatic Colour : Royal Blue ATPV Rating : 45.0 cal/cm2 HRC's Level : 4(Double Layer) <i>Jacket + Bib Coverall</i> 1.2 Ultrasoft Glove Farbric Blend : 87% Cotton, 12% High Tenacity Nylon and 1 % Antistatic Colour : Royal Blue ATPV Rating : 45.0 cal/cm2 HRC's Level : 4(Double Layer) 1.3 Arch Shield + Helmet with Hood 1.3.1 HELMET:- Helmet Colour : White(Top)/Royal Blue/Navy Blue/Orange/Grey and Black(Bottom) -*not mandatory Visor Colour : UV Coated ATPV Rating : 45.0 cal/cm2 1.3.2 HOOD:- Hood Colour : Royal Blue/Navy Blue/Grey/Orange ATPV Rating : 45.0 cal/cm2 HRC's Level : 4(Double Layer) 1.4 Flame Resistant Balaclava Style : Style 131 Type : Rib Knit Weight : 6.5oz/sq yd Fabric Bled : 86% Cotton, 12% High Tenacity Nylon and 2% Spandex Colour : Navy Blue Fabric : Westex Ultrasoft by Miliken ATPV Rating : 12.1 cal/cm2 HRC's Level : 2(Single Layer)	L.Sum L.Sum L.Sum L.Sum	..... ..... ..... .....

2.0	EQUIPMENT IN GIS TAMCO 33KV SWITCHGEAR		
	33kV GIS Switchgear		
	2000A Incomer Panel		
	1.0 2000 33kV 25 KA Vacuum Circuit Breaker	1	.....
	2.0 2000 33kV 25 KA Disconnecting Switch	1	.....
	3.0 Overcurrent & Earth Fault Relay	1	.....
	4.0 Digital Power Meter c/w Communication Port	1	.....
	5.0 33kV/110V Class 0.5 100VA Potential Transformer (Plug in)	1	.....
	6.0 600/300/5A CLASS 5P1015VA Current Transformer	1	.....
	7.0 600/300/5A CLASS 0.51015VA Current Transformer	1	.....
	8.0 Indicating Light	1	.....
	9.0 Phase Indicator	1	.....
	10.0 Local/Remote selector Switch for Cable ESW	1	.....
	11.0 Open/Neutral/Remote selector Switch for Disc. SW	1	.....
	12.0 Trip/Neutral/Close Selector Switch for VCB	1	.....
	13.0 Control MCB and Cable	1	.....
	14.0 Control Relay & Ter. Block	1	.....
	15.0 Healthy Trip Light & Push Button	1	.....
	16.0 MIMIC Diagram	1	.....
	17.0 Semaphore Indicator Light for VCB	1	.....
	18.0 Semaphore Indicator Light for Disc.SW	1	.....
	19.0 Semaphore Indicator Light for Cable ESW	1	.....
	20.0 Cubicle	1	.....
	21.0 Painting Process and Paint thickness as per TAMCO Standard	1	.....
	22.0 SF6 Gas Filling & SF6 Leaking Detector Equipment	1	.....
	23.0 Current & Voltage Test Plug		
	24.0 Plug in Termination Kit & Dummy Plug	1	.....
	25.0 Plugin Bushing	1	.....

26.0	Copper busbar in plugin bushing	1	.....
27.0	Insulating connector	1	.....
28.0	Spiral contact	1	.....
29.0	End Cover	1	.....
30.0	Earth Bar to connect main earth Grid at site	1	.....
31.0	Viewing Window for busbar chamber SF ⁶ Gas pressure monitoring device	1	.....
32.0	Viewing Window & Facia for disconnect switch	1	.....
33.0	Padlockable Handle for VCB Compartment	1	.....
34.0	Breaker Facia & Breaker Chamber SF ₆ Gas Pressure Monitoring Device	1	.....
35.0	Padlockable Handle for VCB Compartment	1	.....
36.0	Viewing window for breaker & breaker indications	1	.....
37.0	Padlockable handle for aux compartment	1	.....
38.0	Hole for routing interpanel wire	1	.....
39.0	Plug in type potential transformer	1	.....
40.0	Busbar Gas Compartment	1	.....
41.0	Busbar	1	.....
42.0	Fault Passage Sensor	1	.....
43.0	Gland Plate	1	.....
44.0	Power Cable	1	.....
45.0	Current Transformer	1	.....
46.0	Rear Cover	1	.....
47.0	Bursting Disk	1	.....
48.0	Duct For Hot Gas		
49.0	Power Cable Adapter	1	.....
50.0	Earth Bar	1	.....
45.0	Magnetic Interlock & Push Button	1	.....
46.0	Rear Cover Limit Switch	1	.....
47.0	Rear Cover Handle	1	.....
48.0	Base Frame	1	.....

3.0	REACTOR TRANSFORMER CAPACITOR BANK			
	To supply and install:-			
	1.0	5 KVAR/525V/50HZ/425V	No.	.....
	2.0	10 KVAR/525V/50HZ/425V	No.	.....
	3.0	15 KVAR/525V/50HZ/425V	No.	.....
	4.0	20 KVAR/525V/50HZ/425V	No.	.....
	5.0	25 KVAR/525V/50HZ/425V	No.	.....
	6.0	30 KVAR/525V/50HZ/425V	No.	.....
	7.0	35 KVAR/525V/50HZ/425V	No.	.....
	8.0	40 KVAR/525V/50HZ/425V	No.	.....
	9.0	45 KVAR/525V/50HZ/425V	No.	.....
	10.0	50 KVAR/525V/50HZ/425V	No.	.....
	11.0	55 KVAR/525V/50HZ/425V	No.	.....
	12.0	60 KVAR/525V/50HZ/425V	No.	.....
	13.0	65 KVAR/525V/50HZ/425V	No.	.....
	14.0	70 KVAR/525V/50HZ/425V	No.	.....
	15.0	75 KVAR/525V/50HZ/425V	No.	.....
	16.0	80 KVAR/525V/50HZ/425V	No.	.....
	17.0	85 KVAR/525V/50HZ/425V	No.	.....
	18.0	90 KVAR/525V/50HZ/425V	No.	.....
	19.0	95 KVAR/525V/50HZ/425V	No.	.....
	20.0	100 KVAR/525V/50HZ/425V	No.	.....
	21.0	150 KVAR/525V/50HZ/425V	No.	.....
	22.0	200 KVAR/525V/50HZ/425V	No.	.....
	23.0	250 KVAR/525V/50HZ/425V	No.	.....
	24.0	300 KVAR/525V/50HZ/425V	No.	.....
	25.0	350 KVAR/525V/50HZ/425V	No.	.....
	26.0	400 KVAR/525V/50HZ/425V	No.	.....
27.0	450 KVAR/525V/50HZ/425V	No.	.....	
28.0	500 KVAR/525V/50HZ/425V	No.	.....	

KADAR HARGA PEMBAIKAN SISTEM BEKALAN ELEKTRIK(PENCAWANG ELEKTRIK & JANAKUASA TUNGGUSEDIA) DI UNIVERSITI TEKNOLOGI MARA CAWANGAN SELANGOR KAMPUS PUNCAK ALAM DAN KAMPUS PUNCAK PERDANA BAGI TEMPOH EMPAT(4) BULAN

BIL.	KETERANGAN KERJA	UNIT	HARGA (RM)
	<u>CIVIL AND STRUCTURE WORKS</u>		
1.0	Building Painting		
1.1	<u>External Wall Painting</u> Prepare wall surface for painting inclusive of brushing and cleaning of dust and apply one coat weather resistant and anti-fungus ICI Pentalite sealer and coats weather resistant and anti-fungus ICI emulsion paint as described to plastered wall with approved UiTM corporate colour.	m ²	.....
1.2	<u>Internal Wall Painting</u> Prepare wall surface for painting inclusive of brushing and cleaning of dust and apply one coat ICI Pentalite sealer and 2 coats ICI emulsion paints as described to plastered wall	m ²	.....
1.3	<u>Ceiling Painting</u> Prepare and apply one coat sealer and two coats ICI emulsion paint to ceiling	m ²	.....
1.4	<u>Floor Painting</u> Prepare and apply one epoxy primer and two epoxy non-slip deck paint green in colour as described on concrete surface.	m ²	.....
2.0	<u>UiTM Logo</u> To supply and fix UiTM logo including wording as described and specified with polycarbonate and stickers	no.	.....
3.0	To stencil switchgear number measuring 4 inch on switchgear	Lump sum	.....
4.0	<u>Chain link Fence</u>		
4.1	To supply and install 2100mm PVC coated chain link fence with barded wire around the building as described.	m	.....
4.2	To rectify and make good damaged chain link fence	m	.....
5.0	To rectify and make good damaged perimeter drain	m	.....
6.0	<u>Road Works</u> To trim, grade and level sub grade to required fall and chamber and compact. Supply and lay 50mm thick sand base and compact. Supply and lay 230mm thick crusher run road base in two equal layers and compact. Supply and lay 65mm thick asphalted macadam binder course and 40mm thick macadam binder wearing course all inclusive of prime and binder bitumen.	m ²	.....

PERKHIDMATAN PENYELENGGARAAN INFRASTRUKTUR SISTEM BEKALAN ELEKTRIK(PENCAWANG ELEKTRIK & JANAKUASA TUNGGUSEDIA) DI UNIVERSITI TEKNOLOGI MARA CAWANGAN SELANGOR KAMPUS PUNCAK ALAM DAN KAMPUS PUNCAK ALAM BAGI TEMPOH EMPAT(4) BULAN.

BIL	KETERANGAN KERJA	UNIT	HARGA (RM)
A	<u>Maintenance For Generator Set</u>		
1	Membekal dan top-up air bateri.		
	i) Deionised Water (NiCad)	liter	.....
	ii) Distilled Water (Lead Acid)	liter	.....
2	Membekal dan menghantar air bateri.		
	i) Deionised Water (NiCad)	liter	.....
	ii) Distilled Water (Lead Acid)	liter	.....
3	Membekal dan top-up minyak enjin (SAE 15W/40).	liter	.....
4	Membekal dan menghantar minyak enjin (SAE 15W/40).	liter	.....
5	Membekal dan top-up coolant	liter	.....
6	Membekal dan menghantar coolant	liter	.....
7	Servis radiator / flushing (all range)	No.	.....
8	Membekal dan mengisi minyak diesel untuk Generator set.	liter	.....
9	Membekal dan memasang bateri Generator jenis NiCad seperti berikut :-		
	i) 60 KVA - 125 KVA (NiCad).	set	.....
	ii) 150 KVA - 250 KVA (NiCad).	set	.....
	iii) 550KVA(NiCad).	set	.....
	iv) 800KVA(NiCad).	set	.....
	v) 1000 KVA (NiCad).	set	.....
10	Membekal dan memasang 'Digital Temperature Controller'.	lot	.....
11	Memeriksa, menguji dan membaiki litar kawalan genset (AMF Board).	lot	.....

12	Memeriksa, menguji dan memperbaiki litar kawalan 'change over contactor'.	lot	.....
13	Kerja-kerja penyenggaraan papan suis 500 ~ 800 Amp (Essential Board).	lot	.....
	i) Pengujian Penebatan		.....
	ii) Pengujian Elektrod Bumi		.....
	iii) Pengujian Keterusan Pengalir		.....
	iv) Mengetat Skru Bolt dan Nut Busbar		.....
	v) Mencuci dan membersihkan sesentuh dan segala kerja berkaitan.		.....
14.0	Membalut exhaust pada flexible silencer dengan rockwool dan aluminium foil. (Exhaust insulation)	meter	.....
15.0	Membekal dan memasang pintu kedap bunyi (acoustic door) satu daun l/d aksesori berkaitan.	No.	.....
16.0	Membekal dan memasang pintu kedap bunyi (acoustic door) dua daun l/d aksesori berkaitan spt selak dan kunci.	No.	.....
17.0	Membekal dan memasang telinga kunci pada pintu genset.	No.	.....
18.0	Membekal dan memasang selak bawah dan atas saiz 4".	No.	.....
19.0	Membekal dan memasang selak bawah dan atas saiz 16".	No.	.....
20.0	Membekal tong drum 200L	No.	.....
21.0	Kerja-kerja membuka dan membuang semua jenis pintu kedap bunyi(acoustic door) lama.	No.	.....
22.0	Membekal dan memasang steel fram door untuk bilik generator.	m	.....
23.0	Membekal dan memasang kunci pintu bilik genset dan lain-lain berkaitan	No.	.....

B	<u>JADUAL KADAR HARGA - ALAT GANTI UMUM GENSET</u>		
	<u>MEMBEKAL, MENGHANTAR DAN MEMASANG</u>		
	1 Membekal elektrik pam (3/4 HP 240 VAC) bagi pam minyak	No.	.....
	2 Photo-relay 16A, 240VAC	No.	.....
	3 Under Voltage Relay AC 440 V	No.	.....
	4 Exhaust Fan 2'	No.	.....
	5 CH Diode	No.	.....
	6 Auxilary Contactor	No.	.....
	7 Battery Terminal	No.	.....
	8 Lever Indicator Float Switch	No.	.....
	9 Battery Flexible Cable (Welding cable)	meter	.....
	10 Cancel Alarm Button	No.	.....
	<u>RELAY 240VAC</u>		
	1 Relay 240VAC - 8 pins (250VAC, 10 A) c/w base	No.	.....
	2 Relay 240VAC - 11 pins (250VAC, 10 A) c/w base	No.	.....
	3 Relay 240VAC - 14 pins (250VAC, 10 A) c/w base	No.	.....
	<u>RELAY 24VDC</u>		
	1 Relay 24VDC - 8 pins (24VDC, 10 A) c/w base	No.	.....
	2 Relay 24VDC - 11 pins (24VDC, 10 A) c/w base	No.	.....
	3 Relay 24VDC - 14 pins (24VDC, 10 A) c/w base	No.	.....

C	<u>MENYEWA SET GENERATOR</u> CATATAN : <u>KADAR HARGA TERMASUK PENYEDIAAN KOS-KOS BERIKUT :</u> <i>a. Pengangkutan ke lokasi yang ditetapkan</i> <i>b. Minyak Diesel untuk genset dan pengangkutan yang lain</i> <i>c. Kabel- kabel penyambungan ke board MSB/AMF dan sebagainya mengikut panjang yang bersesuaian.</i> <i>d. Penyelenggaraan</i> <i>e. Tenaga Kerja semasa kerja-kerja pemasangan dan tunggusedia.</i> <i>f. Lain-lain kerja berkaitan dengannya.</i> <u>1) Janakuasa 1500 KVA</u> a. Penggunaan bagi 8 jam yang pertama. b. Tambahan setiap jam . <u>2) Janakuasa 100KVA</u> a. Penggunaan bagi 8 jam yang pertama. b. Tambahan setiap jam . <u>3) Janakuasa 500KVA</u> a. Penggunaan bagi 8 jam yang pertama. b. Tambahan setiap jam . <u>4) Janakuasa 250KVA - 350KVA</u> a. Penggunaan bagi 8 jam yang pertama. b. Tambahan setiap jam . <u>5) Janakuasa 100KVA-200KVA</u> a. Penggunaan bagi 8 jam yang pertama. b. Tambahan setiap jam . <u>6) Janakuasa 50 KVA -100KVA</u> a. Penggunaan bagi 8 jam yang pertama. b. Tambahan setiap jam .		

PERKHIDMATAN PENYELENGGARAAN INFRASTRUKTUR SISTEM BEKALAN ELEKTRIK(PENCAWANG ELEKTRIK & JANAKUASA TUNGGU SEDIA) DI UiTM CAWANGAN SELANGOR KAMPUS PUNCAK ALAM DAN KAMPUS PUNCAK PERDANA SELANGOR SELAMA EMPAT(4) BULAN.

JADUAL KADAR HARGA JANAKUASA TUNGGUSEDA - ALAT GANTI KHUSUS

BIL	KETERANGAN	UNIT	JENAMA PERKINS		JENAMA VOLVO PENTA		JENAMA CUMMINS	
			800KVA(a)	65KVA(b)	550KVA©	200KVA(d)	800KVA€	250KVA(f)
A	<u>MEMBEKAL, MEMASANG DAN MENGUJILARI TURBO CHARGER</u>							
1.0	Turbo Replacement Kit	LS						
2.0	Gasket Kit Turbo Connecting	LS						
B	<u>COOLING SYSTEM</u>							
1.0	Water Pump Kit	no						
2.0	Radiator Cap	no						
3.0	Top Radiator Hose	no						
4.0	Bottom Rod Hose	no						
5.0	Thermostat	no						
6.0	Sealing Ring	no						
7.0	Coolant Hoses	no						
8.0	Coolant Filters	no						
C	<u>FUEL SYSTEM</u>							
1.0	Fuel Filter	Lot						
2.0	Nozzle Injector	Lot						
3.0	Hollow Screw	Lot						

D	<u>ELECTRICAL SYSTEM</u>							
1.0	Stop Solenoid	no						
2.0	Level Relay	no						
3.0	Electronic Control Unit(ECU)	no						
4.0	Tachnometer Sensor	no						
5.0	Temperature Sensor	no						
6.0	V Belt Alternator	lot						
7.0	Pressure Sensor Engine Oil	lot						
E	<u>ENGINE</u>							
1.0	Cylinder Liner Kit	lot						
2.0	Liner Seal Ring	lot						
3.0	Piston and Piston Rings	lot						
4.0	Bearings	lot						
5.0	Connecting Rod OEM	lot						
6.0	Bushing Con Rod	lot						
7.0	Gasket Kit Reconditioning	lot						
8.0	Big End Bearing	lot						
9.0	Main Bearing	lot						
10.0	Thrust Washer	lot						
11.0	Sealing Ring Flywheel	lot						
12.0	Sump Gasket	lot						
13.0	Seal Ring Timing Cover	lot	.....	.....	.....	.....	.....	.....

14.0	Push Rod	lot						
15.0	Tappet	LS						
16.0	Gasket Oil Sump	LS						
17.0	Drain Plug	lot						
18.0	Oil Pump Gear Kit	lot						
F	<u>CYLINDER HEAD</u>							
1.0	Gasket Cylinder Head	LS						
2.0	Gasket Valve Cover	LS						
3.0	Cooper Sleeve	LS						
4.0	Steel Ring	LS						
5.0	O Ring	LS						
6.0	Valve Guide Inlet	LS						
7.0	Valve Guide Exhaust	LS						
8.0	Valve Seat Inlet	LS						
9.0	Valve Seat Exhaust	LS						
10.0	Inlet Valve	LS						
11.0	Exhaust Valve	LS						
12.0	Gasket Kit Exh. Manifold	LS						
13.0	Gasket Kit Inlet Manifold	LS						
14.0	Rubber Ring	LS						
15.0	Gasket Kit Decarbonising	LS						

G	<u>OTHERS</u>							
1.0	Oil Filter	no						
2.0	Fuel Filter	no						
3.0	Air Filter	no						
4.0	Air Filter (Wet Oil)	no						
5.0	Water Filter	no						
6.0	V Belt Fan	no						
7.0	By Pass Filter	Ls						
8.0	Engine Oil (Genuine Part)	lot						
9.0	Hydrolic Oil	lot						
10.0	Crankshafts	lot						
11.0	Gasket Silencer	lot						
12.0	Valve Plate	LS						
13.0	Ball Plate	LS						
14.0	Intake Pipe	LS						
15.0	Charger Oil Return	LS						
16.0	Muffler	LS						
17.0	Gasket Set	LS						
18.0	Cylinder Head Valve	LS						
19.0	Insert Valve Seat	LS						
20.0	Guide Valve Stem	LS						
21.0	Engine Bearings	LS						

22.0	Damber Vibration	LS						
23.0	Oil Seal	LS						
24.0	Camshaft	LS						
25.0	Push Rod	LS						
26.0	Valve Shutdown	LS						
27.0	Oil Cooler Element	LS						
28.0	Oil Pump	LS						
29.0	Engine Oil	LS						
29.0	Oil Pump	LS						
30.0	Bushing	LS						
31.0	Alternator	LS						
32.0	Rocker Arm and Support	LS						
33.0	Driving Axle	LS						
34.0	Gear	LS						
35.0	Trust Ball Bearings	LS						
36.0	Ball Bearings	LS						
37.0	Deep Grove Ball Bearing	lot						
38.0	Rollers Bearing	lot						
39.0	Enhanced Genset Controller	lot						
40.0	Fuel Pipe	lot						
41.0	Impellers	lot						
42.0	Thermostats	lot						

43.0	Drive Belts	no						
44.0	Crankcase Filters	no						
45.0	Coolant Filters	no						
46.0	Spark Plugs	no						
47.0	Contact Breaker Points	lot						
48.0	Condenses	lot						
49.0	Rotor Arm	lot						
50.0	Distributor Caps	lot						
51.0	Rubber Gaiters	LS						
52.0	Exhaust Gaiters	no						
53.0	Zinc Anodes	no						
54.0	24V Solenoid	nos						
55.0	Automatic Voltage Regulator (Marelli/Stamford/Magnaplus/ Marathon/Leroy Somer)	no						
56.0	Pressure Switch	no	.....	.....	.....	.....	.....	.....
57.0	Starter Switch	no	.....	.....	.....	.....	.....	.....
58.0	Alternator (24VDC)	no	.....	.....	.....	.....	.....	.....
59.0	Alternator (12VDC)	no	.....	.....	.....	.....	.....	.....
60.0	Battery Charger (24VDC)	no	.....	.....	.....	.....	.....	.....
61.0	Battery Charger (12VDC)	no	.....	.....	.....	.....	.....	.....
62.0	Starter Motor	no	.....	.....	.....	.....	.....	.....

63.0	Basic Kit	Lot	.....	.....	.....	.....	.....	.....
	– Cylinder liner kit – Main bearing kit – Big end bearing kit – Thrust washer kit – Gasket kits							
64.0	Comprehensive Kit	Lot	.....	.....	.....	.....	.....	.....
	– Cylinder liner kit – Main bearing kit – Big end bearing kit – Thrust washer kit – Inlet valves – Exhaust valves – Valve seals – Valve lifters – Tappet – Injectors – Injector sleeves – Turbo – Repair kit for oil pump – Repair kit for water circulation pump – Gasket kits							
65.0	<u>Mengujiilari</u>							
	Loadbank test complete test 600kw	Lot	.....	.....	.....	.....	.....	.....
	Complete with cabling 2000kw	Lot	.....	.....	.....	.....	.....	.....
66.0	Automatic Transfer Relay(ATS)	Lot	.....	.....	.....	.....	.....	.....
67.0	Governor	Lot	.....	.....	.....	.....	.....	.....

**PERKHIDMATAN PENYELENGGARAAN INFRASTRUKTUR SISTEM BEKALAN
ELEKTRIK(PENCAWANG ELEKTRIK & JANAKUASA TUNGGUSEDIA) DI UNIVERSITI
TEKNOLOGI MARA CAWANGAN SELANGOR KAMPUS PUNCAK ALAM DAN KAMPUS
PUNCAK PERDANA BAGI TEMPOH EMPAT(4) BULAN**

BIL	KETERANGAN	UNIT	HARGA (RM)
	To supply and install the following :		
	<u>CONVENTIONAL FIRE ALARM SYSTEM</u>		
1	Manual Keyswitch	no.	
2	Ampere Meter 24V/DC/5Amp	no.	
3	Rotary Zone Selector Switch	no.	
4	Smoke Detector c/w Base (Apollo)	no.	
7	Alarm Bell Dia. 24VDC/150mm	no.	
8	Recharged Wet Cell Battery Nife LCP	no.	
9	Heat Detector c/w Base (Demco)	no.	
10	Beacon Light c/w Stroke	no.	
11	Buzzer 24VDC	no.	
12	DC Volt Meter 0-30V	no.	
13	AC Ampere meter 0-30A	no.	
14	Manual Call Point/Breakglass	no.	
15	Alarm Panel Push Button	no.	
16	Supply & Fixed Charger Card - 20	no.	
	<u>GAS SUPRESSION SYSTEM (FM-200 / FE-13)</u>		
18	Fixing Brackets	no.	
19	Valve Assembly	no.	
20	Burst Disc	no.	
21	Low Pressure Switch	no.	
22	Manual Actuator	no.	
23	Pneumatic Actuator	no.	
24	Electrical Actuator	no.	
25	Flexible Discharge Hose	no.	
26	Solenoid Adaptor	no.	
27	Manifold Check Valve	no.	

	<u>GAS SUPRESSION SYSTEM (Co₂)</u>		
48	Solenoid Actuator (BBN)	no.	
49	Hydraulic Discharged Hose c/w Check Valve	no.	
50	Co ₂ Cylinder Head Valve	no.	
51	Dia. 25mm Multijet Horn Discharged Nozzle	no.	
52	Flanged Nozzle Horn	no.	
53	Fan Type Nozzle	no.	
54	Dia. 40mm Directional Valve	no.	
55	45kg Co ₂ Cylinder	no.	
56	Pilot Gas Cylinder	no.	
57	Control Head c/w Solenoid & Control Head	no.	
58	Pilot Bleed Vent	no.	
59	Dia. 20mm Multijet/Horn Discharged Nozzle	no.	
60	Co ₂ Pyrocharged	no.	
61	6' Alarm Bell (Demco)	no.	
62	Heat Detector (Demco)	no.	
63	Single LED Flashing Warning Light	no.	
64	Double LED Flasing Warning Light	no.	
65	Fire Curtain c/w Drop Weight (4.5m x 2.4m)	no.	
66	Tripping Device c/w Solenoid for Fire Curtain	no.	
67	Manual Release/Isolate Switch (Yellow)	no.	
68	Manual Release Switch	no.	
69	Aluminium Alloy-Manual Key Switch	no.	
70	Plastic Manual Key Switch	no.	
72	Smoke Detector (Appolo)	no.	

PERKHIDMATAN PENYELENGGARAAN INFRASTRUKTUR SISTEM BEKALAN ELEKTRIK DI UNIVERSITI TEKNOLOGI MARA CAWANGAN SELANGOR KAMPUS PUNCAK ALAM DAN KAMPUS PUNCAK PERDANA BAGI TEMPOH EMPAT(4) BULAN

CADANGAN JADUAL KADAR HARGA KAKITANGAN TEKNIKAL

1.0 JADUAL KADAR HARGA STAF

Berikut disenaraikan jadual kadar harga (upah) untuk setiap jawatan kakitangan TEKNIKAL yang akan menjalankan Kerja-kerja penyelenggaraan atau kecemasan.

BIL	NAMA JAWATAN	KELAYAKAN	RM / JAM	RM / HARI	RM / BULAN
1.	Jurutera Perkhidmatan Elektrik	Ijazah/Jurutera Kompeten			
2.	HT Chargeman BO – 11kV	Sijil ST B Gred			
3.	HT Chargeman B1 – 33kV	Sijil ST B Gred			

N.B.

Harga-harga yang dinyatakan diatas adalah merangkumi hari bekerja,hari Ahad dan hari Cuti Awam.