



CAWANGAN KEJURUTERAAN MEKANIKAL

TAHUN 2018

**Garis Panduan Anggaran
Harga Sistem Mekanikal
Dalam Bangunan**

GARIS PANDUAN ANGGARAN HARGA SISTEM MEKANIKAL DALAM BANGUNAN TAHUN 2018

-  **SISTEM PENYAMAN UDARA**
-  **SISTEM PENCEGAH KEBAKARAN**
-  **SISTEM BEKALAN AIR SEJUK DALAMAN**
-  **SISTEM KELENGKAPAN KERUSI PERGIGIAN**
-  **SISTEM LAPANG SASAR**
-  **SISTEM GAS PERUBATAN**
-  **SISTEM LIF**
-  **BUILDING AUTOMATION SYSTEM (BAS)**

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1.0 **OBJEKTIF**

- 1.1 Menyediakan garis panduan anggaran kadar harga bagi pemasangan sistem mekanikal dalam bangunan selaras dengan keperluan dan spesifikasi semasa.
- 1.2 Menjadikannya sebagai dokumen rujukan kepada pegawai CKM menyediakan anggaran harga di peringkat pelaksanaan projek.
- 1.3 Memudahkan kerja-kerja membuat anggaran harga sistem dan peralatan mekanikal dengan cepat dan tepat.
- 1.4 Menyeragamkan anggaran harga Jabatan dan mengurangkan jurang perbezaan harga tender/sebutharga yang ketara.
- 1.5 Menjadi dokumen rujukan untuk anggaran harga sistem dan peralatan mekanikal untuk lain-lain tujuan yang berkaitan selain daripada perubahan kerja.

2.0 **PANDUAN PENGGUNAAN**

- 2.1 Penggunaan dokumen ini adalah sebagai rujukan menyediakan **anggaran harga** sistem mekanikal bagi projek baru, kerja-kerja penggantian dan kerja-kerja naiktaraf sistem mekanikal dalam bangunan untuk Semenanjung Malaysia, Sabah dan Sarawak. Kadar harga ini **tidak boleh digunakan** bagi Kerja-kerja Perubahan atau Pindaan di dalam mana-mana kontrak Sebutharga dan Tender yang berasaskan Senarai Kuantiti atau Pelan dan Spesifikasi.
- 2.2 Kadar Harga ini adalah mengikut kategori kawasan yang telah ditetapkan tertakluk kepada tambahan peratusan mengikut zon.
- 2.3 Kadar Harga ini hanya digunakan bagi kerja-kerja sistem mekanikal di dalam bangunan secara konvensional.
- 2.4 Kadar harga yang dinyatakan di dalam garis panduan ini adalah mengambilkira harga peralatan yang berkualiti, upah, pengangkutan, keuntungan, tempoh jaminan, pengujian dan pentauliahan serta senggaraan dalam tempoh kecacatan.
- 2.5 Garis panduan ini turut menyediakan panduan pengiraan secara pukal bagi tujuan mendapatkan anggaran awalan kos projek mekanikal.

3.0 **TAMBAHAN PERATUSAN**

Dibawah ini adalah Jadual kadar harga tambahan peratusan bagi kerja-kerja mengikut zon

3.1 KATEGORI KAWASAN DAN FAKTOR LOKALITI

Kategori-kategori kawasan adalah seperti berikut:

BIL	NEGERI	KATEGORI KAWASAN
i.	Perlis	A
	Kedah	
	Pulau Pinang	
ii.	Perak	B
iii.	Selangor	C
	Wilayah Persekutuan	
	Kuala Lumpur	
	Putrajaya	
	Negeri Sembilan	
	Melaka	
iv.	Johor	D
v.	Pahang	E
vi.	Terengganu	F
	Kelantan	
vii.	Sabah	G
	Sarawak	
	Wilayah Persekutuan Labuan	

Faktor Lokaliti adalah satu Faktor Pendarab (*Multiplying Factor*) yang digunakan untuk pelarasan kos bangunan bagi mengambilkira perbezaan lokaliti.

Berikut adalah jadual faktor lokaliti kategori kawasan yang telah ditetapkan

Kawasan	A	B	C	D	E	F	G
Faktor Lokaliti	1.1305	1.02839	1.0000	0.90677	0.95443	0.94394	1.3

Nota:

Faktor-faktor tersebut telah diperolehi melalui kaedah-kaedah statistik dengan menggunakan kawasan C sebagai lokaliti asas. Pengemaskinian faktor tersebut akan dibuat dari masa ke semasa.

(4)
KADAR HARGA SISTEM PENYAMAN
UDARA

(4.1)

KADAR HARGA BAGI SISTEM

Kaedah pemilihan sistem mestilah diambil kira unit yang lebih besar.

Contoh : Kapasiti reka bentuk penyaman udara wall mounted 17,000 Btu/hr perlu memilih kadar harga peralatan berkapasiti 18,000 Btu/hr.

4.1.1 AIR COOLED SPLIT UNIT SYSTEM

Nota: 1. Kadar harga Pemasangan paip gas penyejuk sehingga 6 meter sahaja.
"Tambahan paip gas penyejuk, pendawaian dan *drain pipe* rujuk anggaran kadar harga jadual peralatan"

2. Harga adalah termasuk harga peralatan yang berkualiti, upah, pengangkutan, keuntungan, tempoh jaminan, pengujian dan pentauliahkan serta senggaraan dalam tempoh kecacatan.

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
Wall Mounted System			Btu/hr			
1	Air-cooled Split Unit air-conditioners c/w indoor and outdoor units,wiring, starter, remote controller, brackets, refrigerant, insulation, drain pipes, switchboard, vibration isolator, coring, hacking, punching of holes in walls/floors, making good, painting, Galvanised Steel trunking and conduit.	25mm Rubber compound pipe insulation	9,000	1	set	2,000.00
			10,000	1	set	2,100.00
			13,000	1	set	2,300.00
			15,000	1	set	2,400.00
			18,000	1	set	3,000.00
			20,000	1	set	3,300.00
			24,000	1	set	3,700.00
			27,000	1	set	4,100.00
			30,000	1	set	4,300.00
		Pre-insulate/ pipe jacket	9,000	1	set	3,000.00
			10,000	1	set	3,100.00
			13,000	1	set	3,300.00
			15,000	1	set	3,400.00
			18,000	1	set	4,000.00
			20,000	1	set	4,300.00
			24,000	1	set	4,700.00
			27,000	1	set	5,100.00
			30,000	1	set	5,300.00
Ceiling Mounted/Suspended						
2	Air-cooled Split Unit air-conditioners c/w indoor and outdoor units,wiring, starter, remote controller, brackets, refrigerant, insulation, drain pipes, switchboard, vibration isolator, coring, hacking, punching of holes in walls/floors, making good, painting, Galvanised Steel trunking and conduit.	25mm Rubber compound pipe insulation	9,000	1	set	2,600.00
			10,000	1	set	2,800.00
			13,000	1	set	3,100.00
			15,000	1	set	3,300.00
			18,000	1	set	3,800.00
			20,000	1	set	4,000.00
			24,000	1	set	4,400.00
			27,000	1	set	5,100.00
			30,000	1	set	6,000.00
			35,000	1	set	6,800.00
			40,000	1	set	7,000.00
			50,000	1	set	7,600.00
			60,000	1	set	8,700.00
		Pre-insulate/ pipe jacket	9,000	1	set	3,600.00
			10,000	1	set	3,800.00
			13,000	1	set	4,100.00

			15,000	1	set	4,300.00	
			18,000	1	set	4,800.00	
			20,000	1	set	5,000.00	
			24,000	1	set	5,400.00	
			27,000	1	set	6,100.00	
			30,000	1	set	7,000.00	
			35,000	1	set	7,800.00	
			40,000	1	set	8,000.00	
			50,000	1	set	8,600.00	
			60,000	1	set	9,700.00	
Cassette 4 Way Blow							
3	Air-cooled Split Unit air-conditioners c/w indoor and outdoor units,wiring, starter, remote controller, brackets, refrigerant, insulation, drain pipes, switchboard, vibration isolator, coring, hacking, punching of holes in walls/floors, making good, painting, Galvanised Steel trunking and conduit.	25mm Rubber compound pipe insulation	9,000	1	set	3,700.00	
			10,000	1	set	3,800.00	
			13,000	1	set	4,000.00	
			15,000	1	set	4,300.00	
			18,000	1	set	4,800.00	
			20,000	1	set	4,900.00	
			24,000	1	set	5,200.00	
			27,000	1	set	6,100.00	
			30,000	1	set	6,200.00	
			35,000	1	set	7,500.00	
			40,000	1	set	7,800.00	
			50,000	1	set	8,300.00	
		Pre-insulate/ pipe jacket	9,000	1	set	4,700.00	
			10,000	1	set	4,800.00	
			13,000	1	set	5,000.00	
			15,000	1	set	5,300.00	
			18,000	1	set	5,800.00	
			20,000	1	set	5,900.00	
			24,000	1	set	6,200.00	
			27,000	1	set	7,100.00	
			30,000	1	set	7,200.00	
			35,000	1	set	8,500.00	
			40,000	1	set	8,800.00	
			50,000	1	set	9,300.00	
Cassette 2 Way Blow							
4	Air-cooled Split Unit air-conditioners c/w indoor and outdoor units,wiring, starter, remote controller, brackets, refrigerant, insulation, drain pipes, switchboard, vibration isolator, coring, hacking, punching of holes in walls/floors, making good, painting, Galvanised Steel trunking and conduit.	25mm Rubber compound pipe insulation	9,000	1	set	3,700.00	
			10,000	1	set	3,800.00	
			13,000	1	set	4,000.00	
			15,000	1	set	4,300.00	
			18,000	1	set	4,800.00	
			20,000	1	set	4,900.00	
			24,000	1	set	5,200.00	
			27,000	1	set	6,100.00	
			30,000	1	set	6,200.00	
				9,000	1	set	4,700.00

		Pre-insulate/ pipe jacket	10,000	1	set	4,800.00
			13,000	1	set	5,000.00
			15,000	1	set	5,300.00
			18,000	1	set	5,800.00
			20,000	1	set	5,900.00
			24,000	1	set	6,200.00
			27,000	1	set	7,100.00
			30,000	1	set	7,200.00
<u>Cassette 1 Way Blow</u>						
5	Air-cooled Split Unit air-conditioners c/w indoor and outdoor units,wiring, starter, remote controller, brackets, refrigerant, insulation, drain pipes, switchboard, vibration isolator, coring, hacking, punching of holes in walls/floors, making good, painting, Galvanised Steel trunking and conduit.	25mm Rubber compound pipe insulation	9,000	1	set	3,700.00
			10,000	1	set	3,800.00
			13,000	1	set	4,000.00
			15,000	1	set	4,300.00
			18,000	1	set	4,800.00
			20,000	1	set	4,900.00
			24,000	1	set	5,200.00
			27,000	1	set	6,100.00
		Pre-insulate/ pipe jacket	30,000	1	set	6,200.00
			9,000	1	set	4,700.00
			10,000	1	set	4,800.00
			13,000	1	set	5,000.00
			15,000	1	set	5,300.00
			18,000	1	set	5,800.00
			20,000	1	set	5,900.00
			24,000	1	set	6,200.00
			27,000	1	set	7,100.00
			30,000	1	set	7,200.00
<u>Floor Standing</u>						
6	Air-cooled Split Unit air-conditioners c/w indoor and outdoor units,wiring, starter, remote controller, brackets, refrigerant, insulation, drain pipes, switchboard, vibration isolator, coring, hacking, punching of holes in walls/floors, making good, painting, Galvanised Steel trunking and conduit.	25mm Rubber compound pipe insulation	30,000	1	set	8,000.00
			40,000	1	set	10,000.00
			50,000	1	set	12,000.00
			60,000	1	set	13,500.00
			80,000	1	set	17,000.00
			100,000	1	set	20,000.00
			125,000	1	set	25,000.00
			150,000	1	set	30,000.00
		Pre-insulate/ pipe jacket	30,000	1	set	10,000.00
			40,000	1	set	12,000.00
			50,000	1	set	14,000.00
			60,000	1	set	15,500.00
			80,000	1	set	19,000.00
			100,000	1	set	22,000.00
			125,000	1	set	27,000.00
			150,000	1	set	32,000.00

4.1.2 AIR COOLED SPLIT PACKAGE/ DUCTED SYSTEM

Nota : 1. Kadar harga pemasangan paip gas penyejuk sehingga 30 kaki sahaja.
Tambahan paip gas penyejuk, pendawaian dan drain pipe rujuk anggaran harga jadual komponen.

2. Harga adalah termasuk harga peralatan yang berkualiti, upah, pengangkutan, keuntungan, tempoh jaminan, pengujian dan pentauliahan serta senggaraan dalam tempoh kecacatan.

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
<u>Air Cooled Split Package / Ducted (Fan Coil Unit)</u>			Btu/hr			
1	Air Cooled Split Ducted Units double skin type each c/w indoor (FCU) and outdoor units, remote controller, brackets, refrigerant, insulation, vibration control equipment, drain pipes, secondary pan, coring, hacking, punching of holes in walls & floors, making good, painting, Galvanised Steel trunking, conduit. Main switchboard c/w test certificate, control wiring, Auto change over control panel c/w interlocking, timer, relay, pushbutton, incoming supply indicating light, starter and cable tray.	Rubber compound pipe insulation	20,000	1	set	5,000.00
			25,000	1	set	6,250.00
			30,000	1	set	7,500.00
			40,000	1	set	10,000.00
			50,000	1	set	12,500.00
			60,000	1	set	15,000.00
			70,000	1	set	17,500.00
			80,000	1	set	20,000.00
			100,000	1	set	25,000.00
			125,000	1	set	31,250.00
			150,000	1	set	37,500.00
			200,000	1	set	50,000.00
			250,000	1	set	62,500.00
			300,000	1	set	75,000.00
			400,000	1	set	100,000.00
		Pre insulate / pipe jacket	15,000	1	set	4,700.00
			20,000	1	set	6,200.00
			25,000	1	set	7,700.00
			30,000	1	set	9,300.00
			40,000	1	set	12,500.00
			50,000	1	set	15,500.00
			60,000	1	set	18,500.00
			65,000	1	set	20,000.00
			80,000	1	set	25,000.00
			100,000	1	set	31,000.00
			125,000	1	set	39,000.00
<u>Air Cooled Split Package / Ducted (Air Handling Units)</u>			Btu/hr			
2	Air Cooled Split Ducted Units double skin type each c/w indoor (AHU) and outdoor units, remote controller, brackets, refrigerant, insulation, vibration control equipment, drain pipes, coring, hacking, punching of holes in walls & floors, making good, painting, Galvanised Steel trunking, conduit.	Rubber compound pipe insulation	30,000	1	set	5,000.00
			40,000	1	set	6,700.00
			50,000	1	set	8,400.00
			60,000	1	set	10,000.00
			80,000	1	set	13,500.00
			100,000	1	set	17,000.00
			125,000	1	set	21,000.00
			150,000	1	set	25,000.00
			200,000	1	set	33,500.00
			250,000	1	set	42,000.00

Main switchboard c/w test certificate, control wiring, Auto change over control panel c/w interlocking, timer, relay, pushbutton, incoming supply indicating light, starter and cable tray.		300,000	1	set	50,000.00
		400,000	1	set	67,000.00
		500,000	1	set	83,500.00
	Pre insulate / pipe jacket	100,000	1	set	20,000.00
		125,000	1	set	25,000.00
		150,000	1	set	30,000.00
		200,000	1	set	40,000.00
		250,000	1	set	50,000.00
		300,000	1	set	60,000.00
		400,000	1	set	80,000.00
		500,000	1	set	100,000.00
		600,000	1	set	120,000.00
		700,000	1	set	140,000.00
		750,000	1	set	150,000.00
		800,000	1	set	160,000.00

4.1.3 AIR COOLED CHILLER SYSTEM

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
<u>Air Cooled Chiller Unit</u>						
1	Air cooled chillers units c/w refrigeration circuit, compressor, condenser coil, fan motor, cooler, electronic expansion valve, built in control panel base plate , starters, vibration control equipment and other accessories.	Scroll compressor	TR			
			10	1	set	17,000.00
			15	1	set	25,500.00
			20	1	set	34,000.00
			30	1	set	51,000.00
			40	1	set	68,000.00
			50	1	set	85,000.00
			60	1	set	102,000.00
			70	1	set	119,000.00
			80	1	set	136,000.00
			90	1	set	153,000.00
			100	1	set	170,000.00
			110	1	set	187,000.00
			120	1	set	204,000.00
			125	1	set	212,500.00
			130	1	set	221,000.00
			140	1	set	238,000.00
			150	1	set	255,000.00
		Screw compressor	50	1	set	110,000.00
			60	1	set	132,000.00
			70	1	set	154,000.00
			80	1	set	168,000.00
			90	1	set	189,000.00
			100	1	set	195,000.00
			105	1	set	199,500.00
			110	1	set	209,000.00
			120	1	set	228,000.00

			130	1	set	247,000.00
			140	1	set	266,000.00
			150	1	set	285,000.00
		Reciprocating Compressor	10	1	set	18,000.00
			15	1	set	27,000.00
			20	1	set	36,000.00
			30	1	set	54,000.00
			40	1	set	72,000.00
			50	1	set	90,000.00
			60	1	set	108,000.00
			70	1	set	126,000.00
			80	1	set	144,000.00
			90	1	set	162,000.00
			100	1	set	180,000.00
			110	1	set	198,000.00
			120	1	set	216,000.00
			130	1	set	234,000.00
			140	1	set	252,000.00
			150	1	set	270,000.00
Air Handling Units (AHU) / Fan Coil Units (FCU)		Btu/hr				
2	Chilled water AHU/FCU double skin type c/w cooling coils, evaporator fans, motor, filters, soft starter, drain pipe, Automatic balancing valve, 3 way valves/2 way modulating valve c/w actuator, thermostat, pressure gauge, gate valves, strainers, flexible connection, base plate, plinth ,switchboard for all AHU/FCU c/w soft starter, relays, control wiring, PF devices, under voltage protection and necessary wiring, cabling, trunking, and conduit	Pre insulate/ jacketing pipe	20,000	1	set	2,400.00
			30,000	1	set	3,500.00
			40,000	1	set	4,700.00
			50,000	1	set	5,900.00
			60,000	1	set	7,000.00
			80,000	1	set	9,500.00
			100,000	1	set	11,700.00
			125,000	1	set	14,600.00
			150,000	1	set	17,500.00
			200,000	1	set	23,500.00
			250,000	1	set	30,000.00
			300,000	1	set	35,000.00
			400,000	1	set	47,000.00
			500,000	1	set	58,500.00
			600,000	1	set	70,000.00
			800,000	1	set	93,500.00
			1,000,000	1	set	117,000.00
			1,250,000	1	set	146,000.00
			1,500,000	1	set	175,000.00
			1,800,000	1	set	210,000.00
2,000,000	1	set	233,500.00			
Main Switchboard For Air Cooled Chiller		TR				
3	Air Conditioning main switchboard c/w test certificate, distribution board for AHU and chiller complete with wiring, starter board for chiller, water pumps c/w motorized isolating valve and remote starter board for all AHU		100	1	set	41,000.00
			105	1	set	43,050.00
			110	1	set	45,100.00
			120	1	set	49,200.00
			130	1	set	53,300.00

	complete with necessary wiring trunking, cable tray, conduit and other necessary accessories		140	1	set	57,400.00
			150	1	set	61,500.00
<u>Chilled Water Pump</u>			HP			
4	Chilled water pump sets complete with high efficiency (HE) EFF1 motor, couplings, jacketing, gate valve, strainer, flexible coupling, check valve, pressure gauge, pressure switch, thermometer, test pipe, base plate, inertia block, starters, vibration control equipment and other accessories	Split Casing	5	1	set	9,400.00
			8	1	set	12,000.00
			10	1	set	13,000.00
			13	1	set	10,125.00
			15	1	set	14,600.00
			20	1	set	20,300.00
			25	1	set	23,000.00
			30	1	set	30,600.00
			35	1	set	33,000.00
			40	1	set	35,000.00
			50	1	set	40,500.00
			150	1	set	121,500.00
		End Suction	3	1	set	3,750.00
			4	1	set	5,000.00
			5	1	set	6,250.00
			8	1	set	9,500.00
			10	1	set	12,500.00
			13	1	set	15,600.00
			15	1	set	18,750.00
			20	1	set	20,000.00
			30	1	set	27,000.00
			50	1	set	42,500.00
			75	1	set	63,800.00
<u>AHU/FCU Switchboard</u>		Btu/hr	KW			
5	Switchboard for all AHU or FCU c/w soft starter, relays, control wiring, PF devices, fire alarm trip from fire alarm panel to individual AHUs, under voltage protection and necessary wiring, cabling, trunking, conduit and other necessary accessories	20,000	2	1	set	700.00
		30,000	3	1	set	1,100.00
		40,000	3	1	set	1,400.00
		50,000	4	1	set	1,700.00
		60,000	5	1	set	2,100.00
		80,000	7	1	set	2,800.00
		100,000	8	1	set	3,500.00
		125,000	10	1	set	4,300.00
		150,000	12	1	set	5,200.00
		200,000	17	1	set	6,900.00
		250,000	21	1	set	8,600.00
		300,000	25	1	set	10,300.00
		350,000	29	1	set	12,000.00
		400,000	33	1	set	14,000.00
		500,000	41	1	set	17,000.00
		600,000	50	1	set	21,000.00
		750,000	62	1	set	26,000.00
		800,000	66	1	set	28,000.00
		1,000,000	83	1	set	35,000.00
		1,250,000	104	1	set	43,000.00

	1,500,000	124	1	set	52,000.00
	1,800,000	149	1	set	61,500.00
	2,000,000	166	1	set	70,000.00

4.1.4 WATER COOLED CHILLER SYSTEM

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
Water Cooled Chiller			TR			
1	Water cooled chillers unit c/w compressors, motor, starter, condenser tube, cooler tube, display control microprocessor based diagnostic system, water pipe, refrigerant circuit & pipe, valves, insulation, oil, base plate, vibration control equipment and other necessary accessories (The selection is based on best COP)	Centrifugal Compressor	300	1	set	420,000.00
			350	1	set	455,000.00
			400	1	set	520,000.00
			450	1	set	562,500.00
			500	1	set	600,000.00
			550	1	set	660,000.00
			600	1	set	720,000.00
			650	1	set	780,000.00
			700	1	set	840,000.00
			750	1	set	900,000.00
			800	1	set	960,000.00
			900	1	set	1,080,000.00
			1,000	1	set	1,200,000.00
		Screw Compressor	TR			
			100	1	set	170,000.00
			110	1	set	187,000.00
			120	1	set	204,000.00
			130	1	set	221,000.00
			135	1	set	229,500.00
			140	1	set	238,000.00
			150	1	set	255,000.00
			160	1	set	272,000.00
			170	1	set	289,000.00
			180	1	set	306,000.00
			190	1	set	323,000.00
			200	1	set	340,000.00
			205	1	set	348,500.00
			210	1	set	357,000.00
			220	1	set	374,000.00
			225	1	set	382,500.00
			250	1	set	425,000.00
			275	1	set	467,500.00
			300	1	set	510,000.00

Chilled Water Pumps			HP			
2	Chilled water pumpsets complete with high efficiency (HE) EFF1 motor, couplings, jacketing, gate valve, strainer, flexible coupling,	Horizontal Split Casing	5	1	set	9,400.00
			8	1	set	12,000.00
			10	1	set	13,000.00
			13	1	set	10,125.00
			15	1	set	14,600.00

	check valve, pressure gauge, pressure switch, thermometer, test pipe, baseplate, inertia block, starters, vibration control equipment and other accessories		20	1	set	20,300.00	
			25	1	set	23,000.00	
			30	1	set	30,600.00	
			35	1	set	33,000.00	
			40	1	set	35,000.00	
			50	1	set	40,500.00	
			150	1	set	121,500.00	
			HP				
		End Suction	3	1	set	3,750.00	
			4	1	set	5,000.00	
			5	1	set	6,250.00	
			8	1	set	9,500.00	
			10	1	set	12,500.00	
			13	1	set	15,600.00	
			15	1	set	18,750.00	
			20	1	set	20,000.00	
			30	1	set	27,000.00	
			50	1	set	42,500.00	
			75	1	set	63,800.00	
			100	1	set	85,000.00	
Condenser Water Pumps		HP					
3	Condenser water pumpsets complete with high efficiency (HE) EFF1 motor , couplings, jacketing, gate valve, strainer, flexible coupling, check valve, pressure gauge, pressure switch, thermometer, test pipe, baseplate, inertia block, starters, vibration control equipment and other accessories	Horizontal Split Casing	5	1	set	5,500.00	
			8	1	set	8,250.00	
			10	1	set	11,000.00	
			13	1	set	13,750.00	
			15	1	set	16,500.00	
			20	1	set	22,000.00	
			25	1	set	27,500.00	
			30	1	set	33,000.00	
			35	1	set	38,500.00	
			40	1	set	44,000.00	
			50	1	set	55,000.00	
			100	1	set	110,000.00	
			HP				
		End Suction	1	1	set	1,250.00	
			2	1	set	1,650.00	
			2	1	set	2,200.00	
			3	1	set	2,750.00	
			3	1	set	3,300.00	
			4	1	set	4,400.00	
			5	1	set	5,500.00	
			8	1	set	8,250.00	
			10	1	set	12,500.00	
			13	1	set	15,625.00	
			15	1	set	18,750.00	
			20	1	set	20,000.00	
			30	1	set	27,000.00	

			50	1	set	42,500.00
			75	1	set	63,750.00
			100	1	set	85,000.00
<u>Cooling Tower</u>						
4	Rujuk 4.1.6					
<u>Main Switchboard for Chiller System</u>			TR			
5	Air Conditioning main switchboard c/w test certificate, distribution board for AHU and chiller complete with wiring, starter board for chiller, water pumps c/w motorized isolating valve and remote starter board for all AHU complete with necessary wiring trunking, cable tray , conduit and other accessories		100	1	set	31,000.00
			110	1	set	34,100.00
			120	1	set	37,200.00
			130	1	set	40,300.00
			140	1	set	43,400.00
			150	1	set	46,500.00
			160	1	set	49,600.00
			170	1	set	52,700.00
			180	1	set	55,800.00
			190	1	set	58,900.00
			200	1	set	62,000.00
			210	1	set	65,100.00
			220	1	set	68,200.00
			250	1	set	77,500.00
			300	1	set	93,000.00
			350	1	set	108,500.00
			380	1	set	117,800.00
			400	1	set	124,000.00
			450	1	set	139,500.00
			500	1	set	155,000.00
			550	1	set	170,500.00
			600	1	set	186,000.00
			650	1	set	201,500.00
			700	1	set	217,000.00
			750	1	set	232,500.00
			800	1	set	248,000.00
<u>Air Handling Unit (AHU) & Fan Coil Units(FCUs)</u>			Btu/hr			
6	Double Skin Chilled water AHU/ FCU c/w cooling coils, evaporator fans, motor, filters, soft starter, drain pipe, Automatic balancing valve, 3 way valves/2 way modulating valve c/w actuator, thermostat, pressure gauge, gate valves, strainers, flexible connection, base plate, plinth and all other accessories Switchboard for all AHU/ FCU c/w soft starter, relays, control wiring, PF		9,000	1	set	1,000.00
			13,000	1	set	1,200.00
			15,000	1	set	1,500.00
			18,000	1	set	1,700.00
			20,000	1	set	1,900.00
			24,000	1	set	2,200.00
			27,000	1	set	2,500.00
			30,000	1	set	2,800.00
			40,000	1	set	3,700.00
			50,000	1	set	4,600.00
			60,000	1	set	5,500.00
			75,000	1	set	6,900.00
			80,000	1	set	7,400.00
			90,000	1	set	8,300.00

	devices, under voltage protection, Fire alarm trip from fire alarm panel to individual AHUs and necessary wiring, cabling, trunking, and conduit		100,000	1	set	9,200.00
			125,000	1	set	11,500.00
			150,000	1	set	13,800.00
			180,000	1	set	16,500.00
			200,000	1	set	18,500.00
			250,000	1	set	23,000.00
			300,000	1	set	27,500.00
			350,000	1	set	32,100.00
			400,000	1	set	37,000.00
			500,000	1	set	46,000.00
			600,000	1	set	55,000.00
			750,000	1	set	69,000.00
			800,000	1	set	74,000.00
7	Chilled water FCU c/w cooling coils, evaporator fans, motors, filters, soft starter, control panel board, drain pipe, Automatic balancing valve, 3 way valves/2 way modulating, valve c/w actuator, thermostat, pressure gauge, gate valves, strainers, flexible connection, base plate, plinth and all other accessories	Wall Mounted (pre-insulate/ jacketing pipe)	9,000	1	set	900.00
			10,000	1	set	1,000.00
			13,000	1	set	1,300.00
			15,000	1	set	1,400.00
			18,000	1	set	1,700.00
			20,000	1	set	1,900.00
			24,000	1	set	2,200.00
			27,000	1	set	2,500.00
			30,000	1	set	2,800.00
		Ceiling Mounted (pre-insulate/ jacketing pipe)	9,000	1	set	1,000.00
			10,000	1	set	1,100.00
			13,000	1	set	1,300.00
			15,000	1	set	1,400.00
			18,000	1	set	1,700.00
			20,000	1	set	2,000.00
			24,000	1	set	2,200.00
			27,000	1	set	2,500.00
			30,000	1	set	2,800.00
			40,000	1	set	3,700.00
			50,000	1	set	4,700.00
			60,000	1	set	5,500.00
		Cassette 4 way blow (pre-insulate/ jacketing pipe)	9,000	1	set	1,500.00
			10,000	1	set	1,700.00
			13,000	1	set	2,100.00
			15,000	1	set	2,300.00
			18,000	1	set	2,700.00
			20,000	1	set	2,900.00
			24,000	1	set	3,200.00
			27,000	1	set	3,500.00
			30,000	1	set	3,800.00
			40,000	1	set	4,500.00
			50,000	1	set	4,800.00
		Cassette 2 way (pre-insulate/ jacketing pipe)	9,000	1	set	1,500.00
			10,000	1	set	1,700.00
			13,000	1	set	2,100.00
			15,000	1	set	2,300.00

			18,000	1	set	2,700.00
			20,000	1	set	2,900.00
			24,000	1	set	3,200.00
			27,000	1	set	3,500.00
			30,000	1	set	3,800.00
		Floor Standing (pre-insulate/ jacketing pipe	30,000	1	set	3,000.00
			40,000	1	set	3,800.00
			50,000	1	set	4,800.00
			60,000	1	set	5,500.00
			80,000	1	set	7,500.00
			100,000	1	set	9,300.00
			125,000	1	set	11,500.00
			150,000	1	set	13,800.00

4.1.5 WATER COOLED PACKAGE SYSTEM

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
<u>Water Cooled Package Units</u>			TR			
1	Water cooled package units each c/w condensers, cooling coil, blower fan motors, compressors, filter driers, sight glass, isolation valves, crankcase heaters, header refrigerant pipes, controller cards, base plate, vibration isolator and other accessories. Switchboard for AHU's, FCU's & CE c/w test certificate, relays, control wiring, PF devices, under voltage protection and necessary wiring, cabling, Hot Dipped G.I trunking, and conduit for complete the operation of the system. Fire alarm trip from fire alarm panel to individual AHU's.	Double skin	10	1	set	19,000.00
			15	1	set	28,500.00
			20	1	set	38,000.00
			25	1	set	47,500.00
			30	1	set	57,000.00
			40	1	set	76,000.00
			50	1	set	95,000.00
			60	1	set	114,000.00
			70	1	set	133,000.00
			80	1	set	152,000.00
			90	1	set	171,000.00
			100	1	set	190,000.00
<u>Condenser Water Pump</u>			HP			
2	Condenser water pumpsets complete with high efficiency (HE) EFF1 motor , couplings, jacketing, gate valve, strainer, flexible coupling, check valve, pressure gauge, pressure switch, thermometer, test pipe, baseplate, inertia block, starters, vibration control equipment and other accessories	Horizontal Split Casing	5	1	set	6,800.00
			8	1	set	10,200.00
			10	1	set	13,500.00
			13	1	set	17,000.00
			15	1	set	20,500.00
			20	1	set	27,000.00
			25	1	set	33,800.00
			30	1	set	40,500.00
			35	1	set	47,500.00
			40	1	set	54,000.00
			50	1	set	67,500.00
			60	1	set	81,000.00

			100	1	set	90,000.00
		End Suction	3	1	set	4,200.00
			4	1	set	5,600.00
			5	1	set	7,000.00
			8	1	set	10,500.00
			10	1	set	14,000.00
			13	1	set	17,500.00
			15	1	set	21,000.00
			20	1	set	25,000.00
			30	1	set	27,500.00
			50	1	set	40,500.00
			75	1	set	67,000.00
Cooling Tower						
3	Rujuk 4.1.6					

4.1.6 COOLING TOWER

Cooling Tower			TR			
3	Cooling tower c/w fan, fan motor , hot water, basin, drain sump, infill, float valve, cat ladder, door access, motorized valves, water pipe supply & return, overflow pipe, valves, chemical dosage metering pump c/w chemical, water treatment system, base plate, conduit, trunking, wiring, control panel, and all other necessary accessories	Counter flow	20	1	set	2,600.00
			30	1	set	3,900.00
			50	1	set	6,500.00
			80	1	set	9,100.00
			100	1	set	13,000.00
			125	1	set	16,250.00
			150	1	set	17,500.00
			200	1	set	23,000.00
			225	1	set	29,300.00
			250	1	set	32,500.00
			300	1	set	39,000.00
			350	1	set	45,500.00
			400	1	set	52,000.00
			450	1	set	58,500.00
			500	1	set	65,000.00
			600	1	set	78,000.00
			700	1	set	91,000.00
			800	1	set	104,000.00
			900	1	set	117,000.00
			1,000	1	set	130,000.00
		Cross flow single cell	50	1	set	8,000.00
			80	1	set	12,800.00
			100	1	set	16,000.00
			125	1	set	20,000.00
			150	1	set	24,000.00
			180	1	set	21,600.00
			200	1	set	32,000.00
			225	1	set	35,000.00
			250	1	set	40,000.00
			275	1	set	44,000.00

			300	1	set	48,000.00
			350	1	set	48,000.00
			375	1	set	55,000.00
			400	1	set	64,000.00
			450	1	set	70,000.00
			500	1	set	76,000.00
			600	1	set	82,000.00
			700	1	set	90,000.00
			750	1	set	96,000.00
			800	1	set	100,000.00
			900	1	set	108,000.00
			1,000	1	set	120,000.00
			1,200	1	set	144,000.00
			1,500	1	set	180,000.00
			2,000	1	set	240,000.00

4.1.7 VARIABLE REFRIGERANT FLOW (VRF) SYSTEM

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
Condenser Units (Outdoor)			Btu/hr			
1	Inverter Multi Split Complete Condensing Units c/w condensers coils, condenser fan motors, compressors, inverter(s), filter driers, slight glass,crankcase heaters, accumulators ,header, refrigerant & refrigerant pipe, controller cards, base plate , starters, vibration control equipment, dries, accumulator, oil separator, Installation inclusive of coring, hacking, punching of holes in walls & floors, making good, painting and other accessories.		45,000	1	set	18,000.00
			54,000	1	set	20,000.00
			72,000	1	set	20,500.00
			90,000	1	set	21,000.00
			108,000	1	set	21,500.00
			126,000	1	set	22,000.00
			144,000	1	set	23,000.00
			162,000	1	set	24,300.00
			180,000	1	set	27,000.00
			198,000	1	set	29,700.00
			216,000	1	set	32,400.00
			234,000	1	set	35,100.00
			252,000	1	set	37,800.00
			270,000	1	set	40,500.00
			288,000	1	set	43,200.00
			306,000	1	set	45,900.00
			324,000	1	set	48,600.00
			342,000	1	set	51,300.00
			360,000	1	set	54,000.00
			378,000	1	set	56,700.00
			396,000	1	set	59,400.00
			414,000	1	set	62,100.00
			432,000	1	set	64,800.00
			540,000	1	set	81,000.00

Fan Coil Units (Indoor Units)						
2	Inverter Multi Split Complete Indoor Units including wired remote control for each indoor unit, power wiring to indoor unit, insulated drain pipes, interlock wiring, starter, G.Steel trunking, conduiting, wireless controller for temperature & fan speed settings, brackets, refrigerant, insulation, drain piping, motors compressors, fans, valves, Installation inclusive of coring, hacking, punching of holes in walls/floors, making good and painting	Wall Mounted	9,000	1	set	1,800.00
			10,000	1	set	2,000.00
			12,000	1	set	2,200.00
			13,000	1	set	2,300.00
			15,000	1	set	2,400.00
			18,000	1	set	2,700.00
			21,000	1	set	2,900.00
			24,000	1	set	3,100.00
			27,000	1	set	3,300.00
			30,000	1	set	3,500.00
		Ceiling Mounted / Suspended	9,000	1	set	1,800.00
			10,000	1	set	2,000.00
			12,000	1	set	2,200.00
			13,000	1	set	2,300.00
			15,000	1	set	2,400.00
			18,000	1	set	2,700.00
			20,000	1	set	2,900.00
			24,000	1	set	3,100.00
			27,000	1	set	3,300.00
			30,000	1	set	3,500.00
			35,000	1	set	3,700.00
			40,000	1	set	4,000.00
			50,000	1	set	4,300.00
			60,000	1	set	4,500.00
		Cassette 4 way	9,000	1	set	2,000.00
			10,000	1	set	2,200.00
			12,000	1	set	2,500.00
			13,000	1	set	2,700.00
			15,000	1	set	2,800.00
			18,000	1	set	3,000.00
			20,000	1	set	3,200.00
			24,000	1	set	3,400.00
			27,000	1	set	3,800.00
			30,000	1	set	4,000.00
			35,000	1	set	4,500.00
			40,000	1	set	5,000.00
			50,000	1	set	6,000.00
			60,000	1	set	7,000.00
		Cassette 1 & 2 way	9,000	1	set	2,000.00
			10,000	1	set	2,200.00
			12,000	1	set	2,500.00
			13,000	1	set	2,700.00
			15,000	1	set	2,800.00
			18,000	1	set	3,000.00
			21,000	1	set	3,200.00
			24,000	1	set	3,400.00
			27,000	1	set	3,800.00
			30,000	1	set	4,000.00
			40,000	1	set	4,000.00

		Floor Standing	50,000	1	set	4,300.00		
			60,000	1	set	4,600.00		
			80,000	1	set	10,000.00		
			100,000	1	set	12,000.00		
			125,000	1	set	15,000.00		
			150,000	1	set	18,000.00		
		Ducted Cassette	9,000	1	set	3,300.00		
			10,000	1	set	3,500.00		
			12,000	1	set	3,800.00		
			13,000	1	set	4,300.00		
			15,000	1	set	4,500.00		
			18,000	1	set	4,700.00		
			20,000	1	set	5,000.00		
			24,000	1	set	5,300.00		
			27,000	1	set	5,500.00		
			30,000	1	set	5,700.00		
			35,000	1	set	5,900.00		
			40,000	1	set	6,000.00		
			50,000	1	set	6,300.00		
		FCU Ducted Type	9,000	1	set	3,500.00		
			10,000	1	set	4,000.00		
			12,000	1	set	4,500.00		
			13,000	1	set	4,700.00		
			15,000	1	set	5,000.00		
			18,000	1	set	5,300.00		
			20,000	1	set	5,500.00		
			24,000	1	set	6,500.00		
			27,000	1	set	6,800.00		
			30,000	1	set	7,500.00		
			35,000	1	set	7,800.00		
			40,000	1	set	8,500.00		
			50,000	1	set	9,000.00		
			60,000	1	set	10,000.00		
			75,000	1	set	11,000.00		
			100,000	1	set	12,000.00		
			125,000	1	set	15,000.00		
			150,000	1	set	18,000.00		
		<u>Switchboard for VRF System</u>			Btu/hr			
3	Air Conditioning main switchboard c/w test certificate, soft starter control wiring, starter, trunking, cable tray , conduit and other accessories		45,000	1	lot	8,500.00		
			54,000	1	lot	10,200.00		
			72,000	1	lot	13,600.00		
			90,000	1	lot	17,000.00		
			108,000	1	lot	20,400.00		
			126,000	1	lot	23,800.00		
			144,000	1	lot	27,200.00		
			162,000	1	lot	30,600.00		
			180,000	1	lot	34,000.00		
			198,000	1	lot	37,400.00		

			216,000	1	lot	40,800.00
			234,000	1	lot	44,200.00
			252,000	1	lot	47,600.00
			270,000	1	lot	51,000.00
			288,000	1	lot	54,400.00
			306,000	1	lot	57,800.00
			324,000	1	lot	61,200.00
			342,000	1	lot	64,600.00
			360,000	1	lot	68,000.00
			378,000	1	lot	71,400.00
			396,000	1	lot	74,800.00
			414,000	1	lot	78,200.00
			432,000	1	lot	81,600.00
			540,000	1	lot	102,000.00

4.1.8 MECHANICAL VENTILATION FAN SYSTEM

Nota : Static head dalam lingkungan 1.0 - 2.0 in.w.g

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
Mechanical Ventilation Fan System			cfm			
1	Exhaust Fan c/w bracket, support bracket, control wiring, , conduit, starter, control panel, installation inclusive of coring, hacking, punching of holes in walls & floors, making good, painting and other necessary accessories	Wall Mounted (Propeller Type)	<150	1	set	550.00
			150	1	set	600.00
			180	1	set	630.00
			200	1	set	650.00
			250	1	set	680.00
			300	1	set	730.00
			400	1	set	750.00
			500	1	set	780.00
			600	1	set	810.00
			700	1	set	840.00
			800	1	set	870.00
			900	1	set	900.00
			1,000	1	set	930.00
		Wall (Axial In Line Type)	200	1	set	650.00
			250	1	set	680.00
			300	1	set	730.00
			400	1	set	750.00
			600	1	set	780.00
			800	1	set	840.00
		Ceiling Mounted (Propeller Type)	200	1	set	650.00
			250	1	set	680.00
			300	1	set	730.00
			400	1	set	750.00
			600	1	set	780.00
			800	1	set	840.00
			200	1	set	650.00

		Ceiling Mounted (Axial -In Line Type)	250	1	set	680.00
			300	1	set	730.00
			400	1	set	750.00
			600	1	set	780.00
			800	1	set	840.00
		Direct Box / Centrifugal Fan	<150	1	set	650.00
			150	1	set	715.00
			180	1	set	730.00
			200	1	set	750.00
			250	1	set	800.00
			300	1	set	900.00
			350	1	set	1,000.00
			400	1	set	1,100.00
			600	1	set	1,400.00
			700	1	set	1,500.00
			800	1	set	1,600.00
		Heavy duty / Industrial (Propeller Type)	800	1	set	1,700.00
			900	1	set	2,000.00
			1,000	1	set	2,700.00
			1,200	1	set	3,500.00
			1,500	1	set	4,700.00
			2,000	1	set	4,900.00
			2,500	1	set	5,200.00
			3,000	1	set	5,400.00
			3,500	1	set	5,700.00
		4,000	1	set	6,000.00	
<u>Air Curtain System</u>			L x Throw (ft)			
2	Air curtain c/w blower fan, motor, starter, controller ,wiring, conduit, , installation inclusive of coring, hacking, puching of holes in walls & floors, making good, painting, Galvanise steel trunking, conduit and other necessary accessories		3x8	1	set	950.00
			4x8	1	set	1,100.00
			3x10	1	set	1,100.00
			4x10	1	set	1,300.00
			3x12	1	set	1,200.00
			4x12	1	set	1,350.00
<u>Smoke Spill System</u>			CFM			
3	Smoke Spill High capacity c/w adjustable Impeller Fan, enclosure, vibration isolators, motor, shutters, withstand temperature, duct, acoustic treatment, support bracket, hanger, wiring, conduit, starter, control panel, installation inclusive of coring, hacking, punching of holes in walls & floors, making good, painting and other necessary accessories		4,000	1	set	6,800.00
			5,000	1	set	8,500.00
			6,000	1	set	10,200.00
			8,000	1	set	11,000.00
			10,000	1	set	12,500.00
			15,000	1	set	13,500.00
			18,000	1	set	15,000.00
			24,000	1	set	16,500.00
			30,000	1	set	18,000.00
			35,000	1	set	20,600.00
			41,200	1	set	21,000.00

			48,000	1	set	28,800.00
			60,000	1	set	30,000.00
			70,000	1	set	35,000.00
			95,000	1	set	47,500.00
<u>Pressurisation Fan System</u>			CFM			
4	Pressurisation Fan System c/w Fan, enclosure, vibration isolators, motor, shutters, withstand temperature, duct, acoustic treatment, support bracket, hanger, wiring, conduit, starter, control panel, installation inclusive of coring, hacking, punching of holes in walls & floors, making good, painting and other necessary accessories		18,000	1	set	15,000.00
			24,000	1	set	16,500.00
			25,500	1	set	17,000.00
			30,000	1	set	18,000.00
			32,000	1	set	19,200.00
			35,000	1	set	21,000.00
			48,000	1	set	24,000.00
			60,000	1	set	30,000.00
			70,000	1	set	35,000.00
<u>Jet Fan System</u>			CFM			
5	Jet Fan System c/w motor,blower, fan, withstand temperature, support bracket, vibration isolators, wiring, conduit, starter, control panel, installation inclusive of coring, hacking, punching of holes in walls & floors, making good, painting and other necessary accessories		24,000	1	set	22,000.00
			30,000	1	set	23,600.00
			35,000	1	set	24,000.00
			43,000	1	set	25,800.00
			45,000	1	set	27,000.00
			60,000	1	set	30,000.00

4.1.9 SPECIAL SYSTEM

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
Precision Air Conditioning System			Btu/hr			
1	Precision Units each c/w indoor and outdoor units, interlock wiring, monitoring & controlling system, controller for temperature & fan speed settings, brackets, refrigerant, insulation & drain piping, motors compressors, fans, vibration control equipment, drain pipes, switchboard, Installation inclusive of coring, hacking, punching of holes in walls & floors, making good, painting. Main switchboard c/w test certificate, control wiring, Auto change over control panel c/w interlocking, timer, relay, pushbutton, incoming supply indicating light, starter,wiring , trunking, cable tray and conduit	Raised Floor	100,000	1	set	52,500.00
			103,000	1	set	54,500.00
			117,000	1	set	62,000.00
			125,000	1	set	66,000.00
			150,000	1	set	79,000.00
			200,000	1	set	105,000.00
			250,000	1	set	132,000.00
			265,000	1	set	140,000.00
Dehumidifier System			kg/hr			
2	Dehumidifier c/w rotary honeycomb desiccant wheel, drying rotor, drive motor, reactivation air fans, electric heaters, filters, valves, refrigerant , pipe, drain pipe, starter, control panel, wiring, conduit, trunking, installation inclusive coring, hacking, painting to wall & floors and other necessary accessories		1	1	set	8,000.00
			2	1	set	10,000.00
			3	1	set	13,000.00
			4	1	set	15,000.00
			5	1	set	17,000.00
			6	1	set	22,000.00
Cold Room System			Btu/hr			
4	Indoor and outdoor units, Acoustic insulation for room, interlock wiring, starter, wireless controller for temperature & fan speed settings, brackets, refrigerant, insulation, drain piping, motors compressors, fans, valves, drain pipes, switchboard, coring, hacking, punching of holes in walls/floors, making good, painting, G.Steel trunking, conduiting.	Freezer	20,000	1	set	40,000.00
			25,000	1	set	46,000.00
			30,000	1	set	55,000.00
			32,000	1	set	60,000.00
			35,000	1	set	65,000.00
			40,000	1	set	75,000.00
			50,000	1	set	92,000.00
		Chiller	30,000	1	set	30,000.00
			40,000	1	set	40,000.00
			50,000	1	set	50,000.00
			60,000	1	set	60,000.00
			75,000	1	set	75,000.00
			100,000	1	set	100,000.00
			125,000	1	set	125,000.00
			150,000	1	set	150,000.00

(4.2) KADAR HARGA BAGI BAHAN

4.2.1 AIR CONDITIONING ITEMS & PARTS

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
1	Refrigerant Gas.		R22	1	kg	30.00
			R134A	1	kg	55.00
			R407C	1	kg	110.00
			R410A	1	kg	150.00
2	<u>Filter.</u>		Standard	1	set	25.00
2.1	Plastic air Filter c/w frame & media filter.	Washable	1x1	1	set	35.00
			2x2	1	set	45.00
2.2	Steel frame air Filter c/w frame & media filter.		1'x1'	1	set	70.00
			1'x2'	1	set	80.00
			2'x2'	1	set	100.00
2.3	Paper air filter c/w frame & media filter.		1'x1'	1	set	40.00
			1'x2'	1	set	50.00
			2'x2'	1	set	60.00
2.4	HEPA filter c/w frame & media filter.		1'x1'	1	set	150.00
			1'x2'	1	set	200.00
			2'x2'	1	set	250.00
3	Filter Drier.		<u>Inch</u>			
			1/4	1	m	60.00
			3/8	1	m	70.00
			1/2	1	m	85.00
			5/8	1	m	105.00
			7/8	1	m	135.00
			1	1	m	150.00
4	Sight Glass.		<u>Inch</u>			
			1/4	1	m	35.00
			3/8	1	m	45.00
			1/2	1	m	60.00
			5/8	1	m	75.00
			7/8	1	m	90.00
			1	1	m	120.00
5	<u>Drain Pan for Fan Coil Units</u> Drain Pan fabricated in galvanised steel, powder painted, withstand corrosion, rubber insulation, outlet pipe and other accessories.			1	m ²	500.00
6	<u>Drain Pump for Air Cooled Split</u> Drain Pump c/w motor, drain pipe, tank wiring and other accessories.		<u>Head (m)</u>			
			2	1	set	300.00
			2.5	1	set	350.00
			3	1	set	400.00
			5	1	set	600.00

7	<u>Ultra Violet Germicidal Irradiation (UVGI) lights.</u> Ultra Violet Germicidal Irradiation c/w water resistant shielded lamp, high efficiency ballast, bracket, cable, power controller, conduit, wiring, air treatment & filter purifier components, ultra violet lights and other accessories.			1	set	3,500.00
8	<u>Expansion Tank.</u> Hot Dipped Galvanised Press Steel Expansion tank c/w insulation, overflow & scour pipe, valves, access cover, plinth, bracket, float valves and all other accessories.		Gallon 400	1	set	6,000.00
9	<u>Make-up water tank.</u> Hot Dipped Galvanised Press Steel tank c/w overflow & scour pipe, valves, access cover, plinth, bracket, float valves and all other accessories.		Gallon 400	1	set	1,600.00
10	<u>Chemical Automatic Dosing.</u> Chemical dosage metering pump c/w chemical, dosage pump, wiring, conduit, liquid hose, tank and all other necessary accessories.		Litre 50	1	lot	4,000.00
11	<u>Variable Air Volume Unit.</u> Variable air volume box unit c/w thermostat, temperature sensor, blower, fan, motor, coil, inlet & outlet duct, mixing box, air damper, control, pipe, actuator wiring, filter, hanger, and other necessary equipment.		CFM 50 100 200 300 450 600 900 1,200 1,500 2,100 2,400 2,700 3,000 4,000 5,000 6,000 7,000	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	set set set set set set set set set set set set set set set set set	800.00 1,000.00 1,200.00 1,500.00 2,000.00 2,500.00 3,000.00 3,800.00 4,500.00 5,500.00 6,500.00 7,500.00 8,500.00 10,000.00 11,500.00 13,000.00 15,000.00

4.2.2 AIR CONDITIONING PIPES

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
1	Copper Tube Refrigerant pipe c/w fittings.	Bare pipe	<u>Dia.(inch)</u>			
			1/4	1	m	15.00
			3/8	1	m	20.00
			1/2	1	m	52.00
			5/8	1	m	68.00
			7/8	1	m	76.00
			1	1	m	84.00
			1 1/8	1	m	96.00
			1 3/8	1	m	110.00
			1 5/8	1	m	124.00
			2 1/8	1	m	150.00
2	Copper Tube Refrigerant piping c/w fittings, gauges, valves & trunking.	With 25mm rubber compound insulation	<u>Size pipe (inch)</u>			
			1/4 & 3/8	1	m	50.00
			1/4 & 1/2	1	m	97.00
			1/4 & 5/8	1	m	115.00
			3/8 & 5/8	1	m	125.00
			1/2 & 7/8	1	m	160.00
			1/2 & 1 1/8	1	m	220.00
			1/2 & 1 3/8	1	m	250.00
			5/8 & 1 3/8	1	m	450.00
			1/2 & 1 1/8	1	m	550.00
3	Copper Tube Refrigerant piping c/w fittings, gauges, valves & trunking.	With 50mm rubber compound insulation	<u>Size pipe (inch)</u>			
			1/4 & 3/8	1	m	60.00
			1/4 & 1/2	1	m	107.00
			1/4 & 5/8	1	m	125.00
			3/8 & 5/8	1	m	135.00
			1/2 & 7/8	1	m	230.00
			1/2 & 1 1/8	1	m	250.00
			1/2 & 1 3/8	1	m	280.00
			5/8 & 1 3/8	1	m	480.00
			1/2 & 1 1/8	1	m	600.00
4	Copper Tube Refrigerant piping c/w fittings, valves & gauges.	With 50mm pre-insulated/Jacketing	<u>Size pipe (inch)</u>			
			1/4 & 3/8	1	m	100.00
			1/4 & 1/2	1	m	170.00
			1/4 & 5/8	1	m	200.00
			3/8 & 5/8	1	m	230.00
			3/8 & 3/4	1	m	150.00
			1/2 & 7/8	1	m	290.00
			1/2 & 1 1/8	1	m	380.00
			1/2 & 1 3/8	1	m	480.00

			5/8 & 1 3/8	1	m	860.00
			1/2 & 1 1/8	1	m	1,100.00
5	Pipe PVC Class 'C' c/w fittings.	Bare pipe	<u>Dia.(inch)</u> 1/2 3/4 1 1 1/4 1 1/2 2 2 1/2 3 4	1 1 1 1 1 1 1 1 1 1	m m m m m m m m m m	15.00 18.00 35.00 37.00 38.00 60.00 63.00 68.00 71.00
6	Pipes PVC Class 'C' c/w fittings & trunking	25 mm Rubber compound insulation	<u>Dia.(inch)</u> 1/2 3/4 1 1 1/4 1 1/2 2 2 1/2 3 4 5 6	1 1 1 1 1 1 1 1 1 1 1 1	m m m m m m m m m m m m	25.00 28.00 45.00 47.00 48.00 70.00 73.00 78.00 81.00 115.00 165.00
7	Pipes PVC Class 'C' c/w fittings & trunking	50 mm Rubber compound insulation	<u>Dia.(inch)</u> 1/2 3/4 1 1 1/4 1 1/2 2 2 1/2 3 4 5 6	1 1 1 1 1 1 1 1 1 1 1 1	m m m m m m m m m m m m	35.00 38.00 55.00 57.00 58.00 80.00 83.00 88.00 91.00 125.00 175.00
8	Pipe ABS c/w fittings.	Bare pipe	<u>Dia.(inch)</u> 1/2 3/4 1 1 1/4 1 1/2 2	1 1 1 1 1 1	m m m m m m	27.00 38.00 43.00 49.00 58.00 87.00
9	Galvanized Steel Class 'C' c/w fittings.	Above ground	<u>Dia.(inch)</u> 1/2 3/4 1 1 1/4	1 1 1 1	m m m m	28.00 35.00 40.00 48.00

			1 1/2	1	m	55.00
			2	1	m	65.00
			2 1/2	1	m	80.00
			3	1	m	95.00
			4	1	m	145.00
			5	1	m	165.00
			6	1	m	185.00
			8	1	m	260.00
			10	1	m	450.00
			12	1	m	550.00
			14	1	m	600.00
10	Galvanized Steel Class 'C' c/w fittings.	Underground - factory wrapped bituminous	<u>Dia.(inch)</u> 1 1/2 2 2 1/2 3 4 5 6 8	1 1 1 1 1 1 1 1	m m m m m m m m	130.00 150.00 170.00 190.00 260.00 290.00 340.00 370.00
11	Galvanized Steel Class 'C' c/w fitting & trunking	25 mm Rubber compound insulation	<u>Dia.(inch)</u> 1/2 3/4 1 1 1/4 1 1/2 2 2 1/2 3 4 5 6 8 10 12	1 1 1 1 1 1 1 1 1 1 1 1 1 1	m m m m m m m m m m m m m m	70.00 90.00 110.00 120.00 140.00 160.00 180.00 200.00 270.00 300.00 350.00 380.00 430.00 560.00
12	Galvanized Steel Class 'C' c/w fitting & trunking	50 mm Rubber compound insulation	<u>Dia.(inch)</u> 1/2 3/4 1 1 1/4 1 1/2 2 2 1/2 3 4 5 6 8 10	1 1 1 1 1 1 1 1 1 1 1 1 1	m m m m m m m m m m m m m	80.00 100.00 120.00 130.00 150.00 170.00 190.00 210.00 280.00 310.00 360.00 390.00 440.00

			12	1	m	570.00
			<u>Dia.(inch)</u>			
			1/2	1	m	220.00
			3/4	1	m	240.00
			1	1	m	260.00
			1 1/4	1	m	270.00
			1 1/2	1	m	290.00
			2	1	m	310.00
			2 1/2	1	m	330.00
			3	1	m	350.00
			4	1	m	420.00
			5	1	m	450.00
			6	1	m	500.00
			8	1	m	530.00
			10	1	m	580.00
			12	1	m	710.00
			<u>Dia.(inch)</u>			
			1/2	1	m	30.80
			3/4	1	m	35.00
			1	1	m	38.30
			1 1/4	1	m	49.30
			1 1/2	1	m	57.50
			2	1	m	71.50
			<u>Dia.(inch)</u>			
			3/4	1	m	26.00
			1	1	m	26.50
			1 1/4	1	m	31.80
			1 1/2	1	m	35.50
			2	1	m	46.30

4.2.3 DUCTING & PLANT ROOM INSULATION

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
1	<u>Ducting Works (Galvanised Steel Sheet Metal Ducts).</u> Supply air ductwork c/w fire damper, guide vanes, splitter, fittings, connections, insulations, hangers and other necessary accessories.		Thickness sheet (mm)			
			0.5	1	m ²	95.00
			0.6	1	m ²	133.00
			0.8	1	m ²	135.00
			1	1	m ²	150.00
			1.2	1	m ²	165.00
			1.6	1	m ²	172.00
			0.5	1	m ²	90.00
			0.6	1	m ²	93.00
			0.8	1	m ²	97.00
			1	1	m ²	101.00

			1.2	1	m ²	135.00
			1.6	1	m ²	150.00
1.3	Internal & External Insulation.		0.5	1	m ²	110.00
			0.6	1	m ²	123.00
			0.8	1	m ²	125.00
			1	1	m ²	135.00
			1.2	1	m ²	150.00
			1.6	1	m ²	175.00
1.4	Bare Duct.		0.5	1	m ²	75.00
			0.6	1	m ²	80.00
			0.8	1	m ²	85.00
			1	1	m ²	90.00
			1.2	1	m ²	95.00
			1.6	1	m ²	100.00
2	Return air ductwork c/w fire damper, guide vanes, splitter, fittings, connections, insulations, hangers and other necessary accessories.					
2.1	External insulation: FG/PE/NR.		0.5	1	m ²	75.00
			0.6	1	m ²	80.00
			0.8	1	m ²	85.00
			1	1	m ²	90.00
			1.2	1	m ²	95.00
			1.6	1	m ²	100.00
3	<u>Ducting Works (Pre Fabricated Ducts)</u> - Supply air ductwork c/w fire damper, guide vanes, splitter, fittings, connections, insulations, hangers silencers (if applicable) and other necessary accessories.					
3.1	Insulation: PU rigid foam.			1	m ²	140.00
4	Return air ductwork c/w fire damper, guide vanes, splitter, fittings, connections, insulations, hangers and other necessary accessories.					
4.1	Insulation: PU rigid foam.			1	m ²	140.00
5	<u>Supply Air Diffusers.</u> Supply air diffusers c/w control dampers, hangers and other necessary accessories.					
5.1	Diffuser hanger system: Adjustable 4.0 mm dia. suspension rod c/w clip.		1' x 1'	1	set	270.00
			2' x 1'	1	set	300.00
			2' x 2'	1	set	350.00
			4' x 2'	1	set	380.00
			linear 2 slot	1	m ²	400.00
			linear 3 slot	1	m ²	500.00
			linear 4 slot	1	m ²	600.00
			round 12" dia	1	m ²	250.00
			jet diffuser	1	set	350.00

6	<u>Return Air Diffusers.</u>					
	<u>Return air diffusers c/w control dampers, hangers and other necessary accessories.</u>					
6.1	Diffuser hanger system: Adjustable 4.0mm dia. suspension rod c/w clip.		1' x 1' 2' x 1' 2' x 2' 4' x 2' linear 2 slot linear 3 slot linear 4 slot round 4" dia	1 1 1 1 1 1 1 1	set set set set m ² m ² m ² m ²	250.00 280.00 330.00 400.00 170.00 330.00 480.00 380.00
7	<u>Damper</u> <u>Damper for supply air duct opening at wall passing through the non-fire zone area.</u>					
7.1	Fire Damper. (Fusible link)			1	m ²	250.00
7.2	Fire Damper. (Motorized)			1	m ²	650.00
7.3	Volume Control Damper.			1	m ²	170.00
7.4	Black off panels damper.			1	m ²	230.00
7.5	Non Return Damper.			1	m ²	550.00
7.6	Splitter Damper.			1	m ²	230.00
7.7	Pressure Stabiliser Damper.			1	m ²	600.00
7.8	Mixing Box c/w adjustable damper.			1	m ²	350.00
8	<u>Steel support hanger ('C' channel mild steel to fixed at beam) for the purpose to hang:</u>					
8.1	Fan Coil Unit (FCU).			1	lot	120.00
8.2	Ducting and other necessary accessories.			1	lot	30.00
9	<u>Plant Room.</u> To supply and install all AHU room insulation c/w rock wool and perforated G.I sheet and all accessories to complete operation of the system.			1	ft ²	65.00

4.2.4 VALVES

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
1	Gate Valve.		<u>inch</u>			
			1/2	1	unit	53.00
			3/4	1	unit	62.00
			1	1	unit	83.00
			1 1/4	1	unit	90.00
			1 1/2	1	unit	125.00
			2	1	unit	156.00
			2 1/2	1	unit	250.00
			3	1	unit	450.00
			4	1	unit	850.00
			5	1	unit	1,200.00
			6	1	unit	1,600.00
			8	1	unit	2,400.00
			10	1	unit	3,500.00
			12	1	unit	4,600.00
			14	1	unit	4,700.00
2	Butterfly Valve.	Conventional	1	1	unit	500.00
			1 1/4	1	unit	600.00
			1 1/2	1	unit	700.00
			2	1	unit	250.00
			2 1/2	1	unit	280.00
			3	1	unit	350.00
			4	1	unit	400.00
			5	1	unit	600.00
			6	1	unit	1,100.00
			8	1	unit	1,400.00
			10	1	unit	2,700.00
			12	1	unit	4,800.00
		Motorized	1	1	unit	800.00
			1 1/4	1	unit	900.00
			1 1/2	1	unit	1,100.00
			2	1	unit	1,300.00
			2 1/2	1	unit	1,400.00
			3	1	unit	1,600.00
			4	1	unit	1,800.00
			5	1	unit	2,300.00
			6	1	unit	2,800.00
			8	1	unit	3,200.00
			10	1	unit	3,500.00
			12	1	unit	4,000.00
3	Globe Valve.		1/2	1	unit	90.00
			3/4	1	unit	111.00
			1	1	unit	117.00
			1 1/4	1	unit	139.00

			1 1/2	1	unit	167.00
			2	1	unit	204.00
			2 1/2	1	unit	371.00
			3	1	unit	490.00
			4	1	unit	663.00
			5	1	unit	810.00
			6	1	unit	1,040.00
			8	1	unit	1,410.00
			10	1	unit	1,930.00
			12	1	unit	2,700.00
			14	1	unit	2,900.00
4	Ball Valve.		Inch			
			1/2	1	unit	70.00
			3/4	1	unit	80.00
			1	1	unit	90.00
			1 1/4	1	unit	110.00
			1 1/2	1	unit	130.00
			2	1	unit	150.00
5	Strainer.		3/4	1	unit	153.00
			1	1	unit	158.00
			1 1/4	1	unit	163.00
			1 1/2	1	unit	186.00
			2	1	unit	262.00
			2 1/2	1	unit	288.00
			3	1	unit	484.00
			4	1	unit	546.00
			5	1	unit	655.00
			6	1	unit	797.00
			8	1	unit	1,150.00
			10	1	unit	1,682.00
			12	1	unit	3,932.00
			14	1	unit	4,100.00
6	Check Valve.		1/2	1	unit	95.00
			3/4	1	unit	117.00
			1	1	unit	139.00
			1 1/4	1	unit	150.00
			1 1/2	1	unit	157.00
			2	1	unit	160.00
			2 1/2	1	unit	200.00
			3	1	unit	260.00
			4	1	unit	350.00
			5	1	unit	479.00
			6	1	unit	490.00
			8	1	unit	725.00
			10	1	unit	961.00
			12	1	unit	1,166.00
			14	1	unit	1,700.00
			1/2	1	unit	70.00
			3/4	1	unit	100.00

7	Flexible Coupling.		1	1	unit	120.00
			1 1/4	1	unit	135.00
			1 1/2	1	unit	150.00
			2	1	unit	180.00
			2 1/2	1	unit	200.00
			3	1	unit	210.00
			4	1	unit	250.00
			5	1	unit	300.00
			6	1	unit	400.00
			8	1	unit	550.00
			10	1	unit	800.00
			12	1	unit	1,100.00
8	Pressure / Air Relief Valve.		1/2	1	unit	80.00
			3/4	1	unit	90.00
			1	1	unit	100.00
			1 1/4	1	unit	130.00
			1 1/2	1	unit	170.00
			2	1	unit	210.00
			2 1/2	1	unit	250.00
			3	1	unit	350.00
9	Modulating / Balancing Valve.		<u>Inch</u>			
			3/4	1	unit	400.00
			1	1	unit	450.00
			1 1/4	1	unit	600.00
			1 1/2	1	unit	850.00
			2	1	unit	1,050.00
			2 1/2	1	unit	1,500.00
			3	1	unit	2,100.00
			4	1	unit	2,800.00
			5	1	unit	4,500.00
			6	1	unit	6,000.00
			8	1	unit	7,300.00
			10	1	unit	8,800.00
10	3 Way Motorized Valve.		3/4	1	unit	460.00
			1	1	unit	475.00
			1 1/4	1	unit	675.00
			1 1/2	1	unit	1,744.00
			2	1	unit	2,240.00
			2 1/2	1	unit	4,454.00
			3	1	unit	5,774.00
			4	1	unit	5,855.00
			5	1	unit	7,309.00
			6	1	unit	7,890.00
			8	1	unit	8,900.00
			10	1	unit	10,000.00
			12	1	unit	13,000.00
			3/4	1	unit	444.00
			1	1	unit	460.00

11	2 Way Motorized Valve.		1 1/4	1	unit	620.00
			1 1/2	1	unit	1,084.00
			2	1	unit	1,153.00
			2 1/2	1	unit	2,835.00
			3	1	unit	3,770.00
			4	1	unit	4,821.00
			5	1	unit	6,120.00
			6	1	unit	7,196.00
			8	1	unit	8,200.00
12	Hand Valve. (Refrigerant Pipe)		10	1	unit	9,500.00
			12	1	unit	11,500.00
			1/2	1	unit	80.00
			3/4	1	unit	100.00
			1	1	unit	150.00
			1 1/4	1	unit	180.00
13	Temperature Gauge.		1 1/2	1	unit	210.00
			2	1	unit	250.00
				1	unit	280.00
				1	unit	400.00
				1	unit	250.00
				1	unit	300.00
				1	unit	350.00
				1	unit	350.00
				1	unit	250.00
				1	unit	800.00
20	Flow Sensor / Gauge.			1	unit	310.00
21	Automatic Air Vent.			1	unit	310.00
22	Pipeline flow indicator.			1	unit	2,000.00

4.2.5 PIPE FITTINGS

A). POLYVINYL CHLORIDE (PVC)

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
1	Tee.	Polyvinyl chloride (PVC)	<u>Inch</u>			
			1/2	1	unit	5.75
			3/4	1	unit	8.25
			1	1	unit	11.20
			1 1/4	1	unit	13.75
			1 1/2	1	unit	17.60
			2	1	unit	24.50
2	Bend.		1/2	1	unit	4.40
			3/4	1	unit	5.25
			1	1	unit	6.75
			1 1/4	1	unit	9.50
			1 1/2	1	unit	13.10
			2	1	Unit	17.10

3	Elbow.		1/2	1	unit	4.60	
			3/4	1	unit	6.00	
			1	1	unit	8.50	
			1 1/4	1	unit	11.25	
			1 1/2	1	unit	13.75	
2	1		unit	20.25			
4	Reducer Tee.		3/4	1	unit	8.25	
			1	1	unit	11.10	
			1 1/4	1	unit	12.00	
			1 1/2	1	unit	18.50	
			2	1	unit	25.75	
5	Equal Tee.		1/2	1	unit	5.75	
			3/4	1	unit	8.25	
			1	1	unit	11.10	
			1 1/4	1	unit	13.75	
			1 1/2	1	unit	17.60	
			2	1	unit	24.50	
6	Reducing Socket.		3/4	1	unit	7.50	
			1	1	unit	10.10	
			1 1/4	1	unit	12.25	
		1 1/2	1	unit	16.75		
		2	1	unit	21.90		
7	End Cap.	1/2	1	unit	5.25		
		3/4	1	unit	8.10		
		1	1	unit	10.90		
		1 1/4	1	unit	12.25		
		1 1/2	1	unit	21.10		
		8	Connector.	1/2	1	unit	5.40
				3/4	1	unit	7.90
				1	1	unit	10.40
1 1/4	1			unit	12.00		
1 1/2	1			unit	16.25		
2	1			unit	22.00		

B) ACRYLONITRILE BUTADIENE STYRENE (ABS)

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
1	Tee.	Acrylonitrile butadiene styrene (ABS)	<u>Inch</u>			
			1/2	1	unit	19.10
			3/4	1	unit	20.25
			1	1	unit	36.50
			1 1/4	1	unit	48.75
1 1/2	1		unit	57.00		
2	Bend.		1/2	1	unit	9.90
			3/4	1	unit	15.25
			1	1	unit	22.38
			1 1/4	1	unit	26.25

		Acrylonitrile butadiene styrene (ABS)	1 1/2	1	unit	28.10
			2	1	Unit	73.00
3	Elbow.		1/2	1	unit	10.75
			3/4	1	unit	16.40
			1	1	unit	24.63
			1 1/4	1	unit	28.40
			1 1/2	1	unit	29.50
			2	1	unit	76.40
4	Reducer Tee.		1/2	1	unit	19.10
			3/4	1	unit	20.25
			1	1	unit	36.50
			1 1/4	1	unit	46.25
			1 1/2	1	unit	57.00
5	Equal Tee.		1/2	1	unit	12.50
			3/4	1	unit	18.60
			1	1	unit	25.60
			1 1/4	1	unit	28.90
			1 1/2	1	unit	34.50
			2	1	unit	54.50
6	Reducing Socket.		1/2	1	unit	10.40
			3/4	1	unit	14.50
			1	1	unit	22.75
			1 1/4	1	unit	26.40
			1 1/2	1	unit	32.25
			2	1	unit	163.25
7	End Cap.		1/2	1	unit	9.60
			3/4	1	unit	12.90
			1	1	unit	15.60
			1 1/4	1	unit	21.50
			1 1/2	1	unit	27.40
			2	1	unit	36.75
8	Connector.		1/2	1	unit	11.25
			3/4	1	unit	14.90
			1	1	unit	19.10
			1 1/4	1	unit	24.00
			1 1/2	1	unit	25.40
			2	1	unit	36.60

C) GALVANISED IRON/STEEL CLASS 'C'

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
1	Tee.	Galvanised iron/steel class 'C'	<u>Inch</u>			
			3/4	1	unit	47.20
			1	1	unit	48.40
			1 1/4	1	unit	49.80
			1 1/2	1	unit	51.80
			2	1	unit	54.80
			2 1/2	1	unit	81.70
			3	1	unit	108.20
			4	1	unit	133.50
			5	1	unit	164.00
			6	1	unit	270.00
			8	1	unit	360.00
2	Bend.	Galvanised iron/steel class 'C'	3/4	1	unit	37.80
			1	1	unit	38.60
			1 1/4	1	unit	39.70
			1 1/2	1	unit	40.00
			2	1	unit	43.80
			2 1/2	1	unit	47.20
			3	1	unit	71.40
			4	1	unit	85.20
			5	1	unit	100.00
			6	1	unit	160.00
			8	1	unit	270.00
			3	Elbow.	Galvanised iron/steel class 'C'	3/4
1	1	unit				38.60
1 1/4	1	unit				39.70
1 1/2	1	unit				40.00
2	1	unit				43.80
2 1/2	1	unit				47.20
3	1	unit				71.40
4	1	unit				85.20
5	1	unit				100.00
6	1	unit				160.00
8	1	unit				270.00
4	Reducer Tee.	Galvanised iron/steel class 'C'				3/4
			1	1	unit	42.00
			1 1/4	1	unit	40.95
			1 1/2	1	unit	42.25
			2	1	unit	61.70
5	Equal Tee.	Galvanised iron/steel class 'C'	1/2	1	unit	21.38
			3/4	1	unit	29.60
			1	1	unit	39.20

			1 1/4	1	unit	48.15
			1 1/2	1	unit	49.00
			2	1	unit	57.60
			2 1/2	1	unit	166.40
6	Reducing Socket.		1/2	1	unit	13.05
			3/4	1	unit	12.00
			1	1	unit	14.18
			1 1/4	1	unit	18.00
			1 1/2	1	unit	19.00
			2	1	unit	20.20
			2 1/2	1	unit	59.00
7	End Cap.		1/2	1	unit	8.33
			3/4	1	unit	10.20
			1	1	unit	12.25
			1 1/4	1	unit	15.90
			1 1/2	1	unit	17.13
			2	1	unit	19.40
			2 1/2	1	unit	55.60
8	Connector.	Galvanised iron/steel class 'C'	43102	1	unit	17.55
			43163	1	unit	21.40
			1	1	unit	24.85
			1 1/4	1	unit	28.80
			1 1/2	1	unit	30.88
			2	1	unit	44.50

4.2.6 INDOOR & OUTDOOR AIR COOLED SPLIT UNIT

No.	Descriptin	Type	Capacity	Quantity	Unit	Price (RM)
Indoor Units			Btu/hr			
1	Air-cooled Split Unit air-conditioners , interlock wiring, starter, wireless controller for temperature & fan speed settings, brackets, refrigerant, insulation, drain piping, motors compressors, fans, valves, drain pipes, switchboard, coring, hacking, punching of holes in walls/floors, making good, painting, G.Steel trunking & conduiting.	Wall mounted	9,000	1	set	570.00
			10,000	1	set	600.00
			12,000	1	set	780.00
			13,000	1	set	790.00
			15,000	1	set	870.00
			18,000	1	set	1,200.00
			20,000	1	set	1,210.00
			24,000	1	set	1,410.00
			27,000	1	set	1,450.00
			30,000	1	set	1,560.00
		Ceiling mounted /suspended	9,000	1	set	1,370.00
			10,000	1	set	1,390.00
			12,000	1	set	1,410.00
			13,000	1	set	1,420.00
			15,000	1	set	1,500.00
			18,000	1	set	1,520.00
			20,000	1	set	1,550.00
			24,000	1	set	1,710.00
			25,000	1	set	1,870.00
			27,000	1	set	2,000.00
			30,000	1	set	2,070.00
			35,000	1	set	2,400.00
			40,000	1	set	2,450.00
			50,000	1	set	2,720.00
			60,000	1	set	3,020.00
		Cassette 4 way blow	9,000	1	set	1,730.00
			10,000	1	set	1,840.00
			12,000	1	set	1,870.00
			13,000	1	set	1,890.00
			15,000	1	set	2,000.00
			18,000	1	set	2,450.00
			20,000	1	set	2,560.00
			24,000	1	set	2,640.00
			25,000	1	set	2,650.00
			27,000	1	set	2,670.00
			30,000	1	set	2,770.00
			35,000	1	set	2,880.00
			40,000	1	set	3,060.00
			50,000	1	set	3,110.00
		Floor standing	30,000	1	set	4,500.00
			40,000	1	set	5,000.00
			50,000	1	set	5,800.00

			60,000	1	set	6,240.00
			80,000	1	set	6,450.00
			100,000	1	set	8,000.00
			125,000	1	set	8,800.00
			150,000	1	set	9,300.00
		Fan coil unit ducted	40,000	1	set	2,290.00
			50,000	1	set	2,680.00
			60,000	1	set	3,270.00
			80,000	1	set	4,050.00
			100,000	1	set	4,400.00
			125,000	1	set	6,100.00
			150,000	1	set	6,800.00
<u>Outdoor Units</u>			<u>Btu/hr</u>			
2	Air-cooled Split Unit air-conditioners, interlock wiring, starter, wireless controller for temperature & fan speed settings, brackets, refrigerant, insulation, drain piping, motors compressors, fans, valves, drain pipes, switchboard, coring, hacking, punching of holes in walls/floors, making good, painting, Galvanised Steel trunking & conduiting.	Condensing units	9,000	1	set	880.00
			10,000	1	set	1,020.00
			12,000	1	set	1,050.00
			13,000	1	set	1,100.00
			15,000	1	set	1,300.00
			18,000	1	set	1,780.00
			20,000	1	set	1,880.00
			24,000	1	set	2,000.00
			25,000	1	set	2,080.00
			27,000	1	set	2,570.00
			30,000	1	set	3,030.00
			35,000	1	set	4,160.00
			40,000	1	set	4,350.00
			50,000	1	set	4,800.00
			60,000	1	set	5,660.00
			70,000	1	set	7,050.00
			80,000	1	set	7,950.00
			100,000	1	set	9,300.00
			125,000	1	set	9,900.00
			150,000	1	set	14,300.00

4.2.7 ELECTRICAL WORKS

Rujuk Jadual Kadar Harga JKR Elektrik (Website CKE).

(5)
KADAR HARGA SISTEM PENCEGAH KEBAKARAN

(5.1) KADAR HARGA BAGI SISTEM

5.1.1 PORTABLE FIRE EXTINGUISHER

No.	Description	Quantity	Unit	Price (RM)
1	9.0 kg. dry powder portable fire extinguishers c/w mounting brackets.	1	set	250.00
	9.0 kg. dry powder portable fire extinguishers c/w mounting brackets and lockable cabinet.	1	set	600.00
2	5.0 kg. carbon dioxide fire extinguishers c/w mounting brackets.	1	set	260.00
	5.0 kg. carbon dioxide fire extinguishers c/w mounting brackets and lockable cabinet	1	set	500.00
3	2.0 kg. carbon dioxide fire extinguishers c/w mounting brackets.	1	set	300.00
	2.0 kg. carbon dioxide fire extinguishers c/w mounting brackets and lockable cabinet.	1	set	800.00

5.1.2 HOSE REEL SYSTEM

No.	Description	Quantity	Unit	Price (RM)
1	i. Heavy duty electric motor pump set c/w starter, couplings, base plate, neoprene pads, etc.			
	[3.0 - 4.0 HP]	1	set	4,500.00
	[5.0 - 6.0 HP]	1	set	5,500.00
	ii. Heavy duty standby diesel engine motor pump set c/w diesel tank, base plate, neoprene pads, insulated exhaust pipe, etc.			
	[4.0 - 5.0 HP]	1	set	6,600.00
	[6.0 - 7.0 HP]	1	set	8,600.00
2	Swing universal type hydraulic hose reels each c/w 30m long 25mm diameter hose, 25mm diameter stop valve and shut-off nozzle, etc.	1	set	500.00
3	Lockable nozzle box.	1	set	100.00
4	Lockable hose reel steel cabinet.	1	set	450.00
5	Galvanised steel/ iron class C-Under ground and above ground pipe works c/w valves, fittings, supports and hangers, pressure gauges, pressure switches, automatic air release valves etc.	1	lot	Rujuk anggaran kadar harga bahan 5.2.2
6	Pump switchboard (control panel) c/w single line schematic circuit diagram, over voltage protector, earthing, voltmeter, ammeter cabling, conduits, electrical works(power and control) include control wiring between switchboard and various equipment, automatic controls, alarms, etc.	1	set	4,500.00
7	Additional wiring to main/ sub fire alarm control. (if applicable)	1	set	3,500.00/ Panel

8	Hot- dipped galvanised pressed steel water tank (2,400 gallons) c/w I-beam, water level indicator (stainless steel wire rope), SS electrodes c/w holder and spacer, ball valve, cover, ladder, overflow pipe, scour pipe, etc.	1	set	17,000.00
9	Piping (within plant room) c/w valves, fittings and accessories.	1	set	2,500.00
10	Lightning surge protector	1	set	500.00
11	Alarm for hose reel system (outside pump room)	1	set	200.00
12	Balancing, calibration, testing and commissioning of all system equipments and components	1	set	1,500.00

5.1.3 DRY RISER SYSTEM

No.	Description	Quantity	Unit	Price (RM)
1	4-way breeching inlet c/w cabinet, additional pipe, fittings, valves and accessories.	1	set	2,200.00
2	Landing valve.	1	unit	600.00
3	Swing type hose cradle each c/w canvas hose, and coupling jet and spray nozzle.	1	unit	600.00
4	Galvanised steel/ iron class C-Under ground and above ground pipe works c/w valves, fittings, supports and hangers, pressure gauges, pressure switches, automatic air release valves etc.	1	lot	Rujuk anggaran kadar harga bahan 5.2.2

5.1.4 WET RISER SYSTEM

No.	Description	Quantity	Unit	Price (RM)
1	Heavy duty electric motor pump set c/w starter, couplings, base plate, inertial block, spring vibration isolators c/w neoprene pads etc.			
	75 HP	1	set	16,000.00
	100 HP	1	set	17,000.00
	125 HP	1	set	18,000.00
2	Multistage electrical jockey pump set c/w starter, couplings, neoprene pads, etc.			
	7.5 HP	1	set	5,000.00
	15 HP	1	set	6,000.00
3	Heavy duty standby diesel engine motor pump set c/w diesel tank, base plate, inertial block, spring vibration isolators c/w neoprene pads, etc.			
	75 HP	1	set	18,000.00
	100 HP	1	set	20,000.00
	125 HP	1	set	22,000.00
4	Pump switchboard c/w cablings, conduits, controls wiring between switchboard and various equipment, automatic controls, alarms, single line schematic circuit diagram, overvoltage protector, earthing, voltmeter, ammeter, etc.	1	Set	18,000.00
	Tank capacity [10,000-12,800 gallon]			
5	4-way breeching inlet c/w cabinet, additional pipe, fittings, valves and accessories.	1	set	2,200.00

6	Landing valve.	1	unit	600.00
7	Swing type cradle each c/w canvas hose coupling jet and spray nozzle, etc.	1	set	600.00
8	Galvanised steel/ iron class C-Under ground and above ground pipe works c/w valves, fittings, supports and hangers, pressure gauges, pressure switches, automatic air release valves etc.	1	lot	Rujuk anggaran kadar harga bahan 5.2.2
9	Hot- dipped galvanised pressed steel water tank c/w water level indicator (stainless steel wire rope),SS electrodes c/w holder and spacer, ball valve, cover, ladder, overflow pipe, scour pipe, etc.	1	set	36,000.00
	Tank capacity [10,000-12,800 gallon]			

5.1.5 SPRINKLERS SYSTEM

No.	Description			Quantity		Unit	Price (RM)
Heavy duty electric motor pump set c/w base plate, inertial block, spring vibration isolators c/w neoprene pads, etc.							
1	HAZARDS CLASS	SPRINKLERS HEIGHT (m)	MOTOR (hp)	Quantity	Unit	(RM)	
	OH I	15	7.5	1	set	7,500.00	
		30	15	1	set	10,000.00	
		45	20	1	set	10,500.00	
			30	1	set	13,000.00	
	OH II	15	15	1	set	9,500.00	
			20	1	set	10,500.00	
		30	25	1	set	11,500.00	
			30	1	set	13,500.00	
		45	40	1	set	15,000.00	
			50	1	set	17,600.00	
	OH III	15	20	1	set	9,700.00	
			25	1	set	11,000.00	
		30	15	1	set	16,000.00	
		45	30	1	set	21,000.00	
Heavy duty standby diesel engine motor pump set c/w diesel tank, base plate, inertial block, spring vibration isolators c/w neoprene pads, Heavy duty maintenance free lead acid rechargeable type battery and metal box, etc.							
2	HAZARDS CLASS	SPRINKLERS HEIGHT (m)	MOTOR (hp)	Quantity	Unit	(RM)	
	OH I	15	7.5	1	set	11,500.00	
		30	15	1	set	13,000.00	
		45	20	1	set	16,000.00	
			30	1	set	20,700.00	
	OH II	15	15	1	set	14,600.00	
			20	1	set	16,200.00	
		30	25	1	set	18,200.00	
			30	1	set	22,100.00	
		45	40	1	set	24,600.00	
			50	1	set	29,300.00	
	OH III	15	20	1	set	15,500.00	
			25	1	set	18,000.00	

		30	15	1	set	26,000.00
		45	30	1	set	35,000.00
3	Multistage electrical jockey pump set c/w starter, couplings, neoprene pads, etc.					
	[1.0 HP]		1		set	3,500.00
	[3.0 – 4.0 HP]		1		set	5,500.00
	[5.0 – 6.0 HP]		1		set	6,000.00
4	Pump switchboard c/w cablings, conduits, controls wiring between switchboard and various equipment, automatic controls, alarms, single line schematic circuit diagram, overvoltage protector, earthing, voltmeter, ammeter, etc.		1		lot	12,500.00
5	4-way breeching inlet c/w cabinet , additional pipe, fittings, valves and accessories		1		set	2,000.00
6	Sprinklers head		1		set	150.00
7	Galvanised steel/ iron class C-Under ground and above ground pipe works c/w valves, fittings, supports and hangers, pressure gauges, flow switches, alarm gongs, strainers, flexible couplings, pressure switches, automatic air release valves, butterfly valves, etc.		1		lot	Rujuk anggaran kadar harga bahan 5.2.2
8	Hot- dipped galvanised pressed steel water tank c/w water level indicator (stainless steel wire rope), electrodes c/w holder and spacer, ball valve, cover, ladder, overflow pipe, scour pipe, etc.					
	a. Tank capacity (18,000-22,000) gallon		1		set	55,000.00
	b. Tank capacity (30,000-48,000) gallon		1		set	85,000.00
9	Lightning surge protector		1		set	750.00
10	Spring isolators for neoprene pads for first hanger/support piping		1		set	2,500.00
11	Balancing, calibration, testing and commisioning of all system equipments and components		1		set	2,000.00

5.1.6 AUTOMATIC FIRE DETECTION & ALARM SYSTEM (CONVENTIONAL)

No.	Description	Quantity	Unit	Price (RM)
1	Manual call points (break-glass)	1	unit	250.00
2	Alarm bells/sounder	1	unit	250.00
3	Heat detector	1	unit	275.00
4	Smoke detector	1	unit	250.00
5	Main fire alarm panel c/w mimic diagram, relays, wiring, indications, overvoltage protector, earthing, heavy duty nickel cadmium rechargeable type c/w battery chargers etc.	1	set	15,000.00
6	Repeater fire alarm panel (guard house) c/w mimic diagram, LED light, relays, control wiring, indications, overvoltage protector, etc.	1	set	12,000.00
7	All electrical wiring c/w conduit, underground cable, supports and hangers between fire alarm panel to various points of detectors, alarms, break glass, etc	1	lot	Rujuk anggaran kadar harga bahan 5.2.1
8	Earthing, lightning and surge protection	1	set	3,000.00
9	Maintance free heavy duty nickel cadmium rechargeable c/w battery charges	1	unit	980.00
10	Lightning surge protector signal and power.	1	set	200.00
11	Sistem Pengawasan Kebakaran Automatik (SPKA)	1	set	18,000.00

5.1.7 ADDRESSABLE FIRE DETECTION & ALARM SYSTEM

No.	Description	Quantity	Unit	Price (RM)
1	Addressable manual call points (break-glass).	1	unit	330.00
2	Addressable alarm bell/ sounder.	1	unit	350.00
3	Addressable smoke detector.	1	unit	430.00
4	Addressable heat detector.	1	unit	300.00
5	Addressable Main fire alarm panel c/w central controller (CPU, I/O, power supply module, buzzer ,module), keyboard panel, facial LED display panel, heavy duty nickel cadmium rechargeable type c/w battery chargers overvoltage protector, earthing, dot matrix printer and DC printer supply etc.	1	set	35,000.00
6	Addressable Repeater fire alarm panel c/w cubicle, zone card etc.	1	set	18,500.00
7	Sistem Pengawasan Kebakaran Automatik (SPKA) inclusive direct telecommunication link to Bomba, approval submission of application fees, annual fee for one year, etc.	1	set	7,000.00
8	All electrical wiring c/w conduit, underground cable, supports and hangers between fire alarm panel to various points of detectors, alarms, break glass etc.	1	lot	Rujuk anggaran kadar harga bahan 5.2.1
9	Programming and system calibration.	1	set	68,000.00
10	Lightning surge protector signal and power.	1	set	4,200.00
11	Addressable smoke duct detector.	1	set	1,500.00
12	Addressable beam detector.	1	set	800.00
13	Addressable interface unit (IU-I & IU-O) and interfacing module	1	set	2,300.00
14	Heavy duty nickel cadmium rechargeable type c/w battery charges	1	set	3,000.00
15	Addressable isolator, monitoring and controlling interface modules	1	set	5,000.00
16	Fire signal (dry contact) to Building Management System (BMS) and PA System	1	set	500.00
17	Balancing, calibration, testing and commisioning of all system equipments and components	1	lot	1,500.00
18	Sounder	1	unit	800.00
19	Addressable Multi-Sensor Detector	1	unit	400.00
20	Mimic diagram	1	lot	7,500.00

5.1.8 TOTAL FLOODING FIRE EXTINGUISHING SYSTEM

No.	Description	Quantity	Unit	Price (RM)
1	Switchboard c/w batteries, chargers etc.	1	set	4,700.00
2	Conventional smoke detector	1	unit	250.00
3	Conventional heat detector	1	unit	280.00
4	Manual key switch	1	set	500.00
5	Conventional alarm bells/sounder	1	unit	250.00
6	Warning lights	1	unit	550.00
7	Emergency instruction, signage, etc	1	set	700.00
8	Fire curtain c/w actuator and wiring (size fire curtain)		m ²	1,725.00
9	Mechanical works including piping, nozzle and fittings c/w support and hanger, accessories, etc.	1	set	11,500.00
10	Electrical works including cabling, wiring, control wiring c/w G.I. conduits and accessories	1	set	8,000.00
11	Interfacing unit/Interconnected cable from control panel clean agent to main fire alarm panel	1	set	2,500.00
12	Earthing, lightning and surge protection.	1	set	1,500.00
13	Testing and Commissioning as per specification (Section 3.7; item 10)	1	set	2,500.00

5.1.9 WET CHEMICAL SYSTEM

No.	Description	Quantity	Unit	Price (RM)
1	Storage tank c/w wet chemical gas, pressure gauge, valves and bracket, etc. Capacity 9.5 litres	1	set	6,500.00
2	20mm dia. sch. 40 seamless steel pipe c/w flexible connectors, discharge nozzle, couplers brackets, fittings etc.	1	set	2,500.00
3	ADP/ Plenum/ Duct nozzle	1	unit	200.00
4	Switchboard/ control panel c/w batteries, chargers, wiring etc. as per drawings and specification.	1	set	1,500.00
5	Flash light(Green/red)	1	unit	150.00
6	Master alarm bell	1	unit	150.00
7	Triggering system c/w control panel wiring, detectors, alarm bell and manual key switch	1	set	1,000.00
8	Manual pull station	1	set	180.00

5.1.10 FIRE ROLLER SHUTTER

No.	Description	Quantity	Unit	Price (RM)
1	Approved type of fire rated roller shutter (min 2 hours fire rating) c/w single aluminium standard finish, vertical side guide, bottom slat and other accessories	1	set	45,000.00
2	Roller motor c/w in-line chain driven and other accessories	1	set	20,000.00
3	Switch board c/w manually override push button, batteries, charges, cable, wiring, trunkings, trays, cabinet/panel and all other accessories	1	set	20,000.00

5.1.11 FIREMAN INTERCOM SYSTEM

No.	Description	Quantity	Unit	Price (RM)
1	Fireman Intercom Main Panel c/w Cabinet, Central Controller, Status Panel, Master Handset panel, Heavy duty Nickel Cadmium rechargeable type c/w battery charges and other necessary accessories as per specification.	1	lot	22,500.00
2	Remote handset	1	unit	240.00
3	Electrical works including wiring in G.I conduit to all panels devices, equipment, modules and all necessary accessories.	1	lot	16,000.00
4	Lightning surge arrestor (Price will vary according to actual drawing)	1	lot	2,000.00
5	Sample board (mock up)	1	set	200.00

5.1.12 PRESSURIZED HYDRANT

No.	Description	Quantity	Unit	Price (RM)
1	Heavy duty electric motor pump set c/w starter, couplings, base plate, inertial block, spring vibration isolators c/w neoprene pads etc.			
	1.1 75 HP	1	lot	18,500.00
	1.2 55 HP	1	lot	15,500.00
2	Heavy duty standby diesel engine motor pump set c/w diesel tank, base plate, inertial block, spring vibration isolators c/w neoprene pads, etc.			
	2.1 75 HP	1	lot	40,000.00
	2.2 55 HP	1	lot	18,500.00
3	Multistage electrical jockey pump set c/w starter, couplings, neoprene pads, etc.			
	3.1 15 HP	1	lot	6,000.00
	3.2 4 HP	1	lot	4,500.00

4	Electrical works including cabling, wiring, control wiring c/w G.I. conduits and accessories	1	lot	9,000.00
5	Pump switchboard c/w cablings, conduits, controls wiring between switchboard and various equipment, automatic controls, alarms, single line schematic circuit diagram, overvoltage protector, earthing, voltmeter, ammeter, etc.	1	lot	13,000.00
6	Lightning surge protector signal and power (Price will vary according to actual drawing)	1	lot	3,500.00
7	Galvanised steel/iron class C-Under ground and above ground pipe works c/w valves, fittings, supports and hangers, pressure gauges, pressure switches, automatic air release valves etc.	1	lot	15,300.00
8	spring isolators c/w neoprene pads for first hanger /support piping as per spesification	1	lot	2,000.00
9	Hot- dipped galvanised pressed steel water tank c/w water level indicator (stainless steel wire rope),SS electrodes c/w holder and spacer, ball valve, cover, ladder, overflow pipe, scour pipe, etc.			
	36,000 gallon	1	lot	95,600.00
10	Sample board ,sample of workmanship)mock up for approval S.O	1	lot	400.00

(5.2)

SENARAI HARGA BAGI BAHAN

5.2.1 ELECTRICAL WORKS

No.	Description	Specification	Quantity	Unit	Price (RM)
1	PVC cables/Electric cable only.	1½ mm ²	1	m	31.00
		2½ mm ²	1	m	41.00
		4 mm ²	1	m	70.00
2	PVC cables/Electric cable in conduit.	1.5mm ²	1	m	44.00
		2.5mm ²	1	m	68.00
		4.0mm ²	1	m	108.00
3	G.I. conduit.	19 mm	1	m	52.00
		25 mm	1	m	60.00
4	G.I. trunking.	1" x 2"	1	m	45.00
		2" x 2"	1	m	60.00
		2" x 3"	1	m	70.00
5	PVC/SWA/PVC cable. (Armoured cable)	4C x 1½ mm ²	1	m	25.00
		3C x 2½ mm ²	1	m	30.00
		4C x 2½ mm ²	1	m	60.00
		3C x 4 mm ²	1	m	70.00
		4C x 4 mm ²	1	m	85.00
6	MCB.	6A SPN	1	unit	22.00
		13A SPN	1	unit	23.00
		13A 3P	1	unit	25.00
		16A 3P	1	unit	28.00
		20A 3P	1	unit	37.00
		30A 3P	1	unit	45.00
7	MCCB.	16A 3P	1	unit	57.00
		20A 3P	1	unit	62.00
		30A 3P	1	unit	68.00
8	Control timer.	240VAC	1	unit	78.00
		24VAC	1	unit	56.00
9	Control relays.	240VAC	1	unit	95.00
		24VAC	1	unit	65.00
10	Contactor.	AC3 16A 4P	1	unit	50.00
		AC3 20A 3P	1	unit	54.00
		AC3 30A 3P	1	unit	62.00
		AC3 40A 3P	1	unit	66.00
		AC3 60A 3P	1	unit	78.00
11	Overload.	4 ~ 16 A 3P	1	unit	83.00
		16 ~ 25 A 3P	1	unit	95.00
		25 ~ 35 A 3P	1	unit	105.00
12	Battery.	10 AH	1	unit	1,140.00
		12 AH	1	unit	1,448.00
		20AH	1	unit	1,795.00
13	Battery charger.		1	unit	460.00

5.2.2 PIPING

No.	Description	Specification	Quantity	Unit	Price (RM)
1	Underground galvanised iron/steel class 'C' pipes. (pre insulated bituminous factory wrapped externally)	<u>Dia. (inch)</u>			
		1	1	m	94.00
		1¼	1	m	120.00
		1½	1	m	150.00
		2	1	m	154.00
		2½	1	m	185.00
		3	1	m	242.00
		4	1	m	292.00
2	Above ground galvanised iron/steel class 'C' pipes.	6	1	m	380.00
		½	1	m	36.00
		¾	1	m	43.00
		1	1	m	49.00
		1¼	1	m	60.00
		1½	1	m	78.00
		2"	1	m	90.00
		2½	1	m	110.00
		3"	1	m	130.00
		4	1	m	158.00
3	Schedule 40 seamless galvanised iron/steel.	6	1	m	198.00
		½	1	m	49.00
		¾	1	m	60.00
		1	1	m	101.00
		1¼	1	m	126.00
		1½	1	m	156.00
		2	1	m	197.00
		2½	1	m	225.00

5.2.3 VALVES

No.	Description	Specification	Quantity	Unit	Price (RM)
1	Non rising spindle gate valves.	<u>Dia. (inch)</u>			
		½	1	unit	19.00
		1	1	unit	23.00
		1½	1	unit	32.00
		2	1	unit	60.00
		2½	1	unit	70.00
		3	1	unit	85.00
		4	1	unit	105.00
2	Stop valves.	1	1	unit	150.00
		2	1	unit	160.00
3	Landing valves.		1	unit	540.00
4	Gate valves	1	1	unit	33.00
		1½	1	unit	50.00
		2"	1	unit	54.00

		2½	1	unit	62.00
		3	1	unit	70.00
		4	1	unit	87.00
		5	1	unit	145.00
		6	1	unit	430.00
5	Check valves.	½	1	unit	53.00
		1	1	unit	70.00
		1½	1	unit	80.00
		2	1	unit	90.00
		2½	1	unit	99.00
		3	1	unit	107.00
		4	1	unit	150.00
		5	1	unit	210.00
		6	1	unit	240.00

5.2.4 PIPE WORK FITTINGS & ACCESSORIES

No.	Description	Specification	Quantity	Unit	Price (RM)
1	G.I. elbows.	<u>Dia. (inch)</u>			
		½	1	unit	15.00
		¾	1	unit	16.00
		1	1	unit	18.00
		1¼	1	unit	24.00
		1½	1	unit	28.00
		2"	1	unit	50.00
		2½	1	unit	60.00
		3	1	unit	75.00
		4	1	unit	100.00
		6	1	unit	122.00
2	G.I. tees.	½	1	unit	15.00
		¾	1	unit	19.00
		1	1	unit	21.00
		1¼	1	unit	27.00
		1½	1	unit	52.00
		2	1	unit	60.00
		2½	1	unit	42.00
		3	1	unit	70.00
		4	1	unit	90.00
		6	1	unit	118.00
3	G.I. cross tees.	½	1	unit	27.00
		¾	1	unit	29.00
		1	1	unit	30.00
		1¼	1	unit	33.00
		1½	1	unit	45.00
		2"	1	unit	58.00
		2½	1	unit	83.00
		3	1	unit	89.00

		4	1	unit	150.00
		6	1	unit	175.00
4	G.I. reducing tees.	2 x 1	1	unit	30.00
		2½ x 1	1	unit	45.00
		2½ x 2	1	unit	52.00
		4 x 1	1	unit	58.00
		4 x 2	1	unit	70.00
		4 x 2½	1	unit	90.00
5	G.I. reducing bush.	2 x 1	1	unit	16.00
		2½ x 1	1	unit	27.00
		2½ x 2	1	unit	35.00
		4 x 1	1	unit	40.00
		4 x 2	1	unit	52.00
		4 x 2½	1	unit	58.00
6	Schedule 40 seamless galvanized steel elbows.	½	1	unit	20.00
		¾	1	unit	22.00
		1	1	unit	25.00
		1¼	1	unit	30.00
		1½	1	unit	40.00
		2	1	unit	48.00
		2½	1	unit	62.00
7	Schedule 40 seamless galvanized steel tees.	½	1	unit	24.00
		¾	1	unit	26.00
		1	1	unit	32.00
		1¼	1	unit	36.00
		1½	1	unit	46.00
		2	1	unit	55.00
		2½	1	unit	61.00
8	Schedule 40 seamless galvanized steel cross tees.	¾	1	unit	27.00
		1	1	unit	32.00
		1¼	1	unit	43.00
		1½	1	unit	59.00
		2	1	unit	65.00
		2½	1	unit	80.00
9	Schedule 40 seamless galvanized steel reducing tees.	2 x 1	1	unit	45.00
		2½ x 1	1	unit	53.00
		2½ x 2	1	unit	55.00
10	Schedule 40 seamless galvanized steel reducing bush.	2 x 1	1	unit	14.00
		2½ x 1	1	unit	20.00
		2½ x 2	1	unit	25.00
11	Strainer.	2	1	unit	87.00
		2½	1	unit	109.00
		3	1	unit	128.00
		4	1	unit	162.00
		5	1	unit	180.00
		6	1	unit	250.00
12	Flexible coupling.	½	1	unit	25.00
		1	1	unit	40.00

		1½	1	unit	65.00
		2	1	unit	90.00
		2½	1	unit	103.00
		3	1	unit	110.00
		4	1	unit	155.00
		5	1	unit	165.00
		6	1	unit	380.00
13	Pressure gauge.	4" Dail face	1	unit	238.00
		6" Dail face	1	unit	330.00
14	Automatic air release valve.	1	1	unit	150.00
		2	1	unit	200.00
15	Pressure differential switch.		1	unit	355.00

5.2.5 DETECTION, ALARM & TOTAL FLOODING (CLEAN AGENT)

No.	Description	Specification	Quantity	Unit	Price (RM)
1	Cylinder actuating valve.	Electric	1	unit	520.00
		Pneumatic	1	unit	600.00
		Manual	1	unit	390.00
2	Clean agent discharge nozzle.	½"	1	unit	320.00
		¾"	1	unit	480.00
		1 "	1	unit	525.00
3	Alarm bell.	6" Dail face	1	unit	120.00
		9" Dail face	1	unit	250.00
4	Manual call point.	Conventional	1	unit	100.00
		Addressable	1	unit	250.00
5	Smoke detector.	Conventional	1	unit	180.00
		Addressable	1	unit	300.00
6	Heat detector.	Conventional	1	unit	150.00
		Addressable	1	unit	250.00
7	Smoke and heat detector.	Conventional	1	unit	200.00
		Addressable	1	unit	300.00
8	Smoke detector duct type.	Conventional	1	unit	365.00
		Addressable	1	unit	445.00
9	Warning light.		1	unit	180.00
10	Control panel for clean agent.	2 zone	1	unit	2,000.00
		4 zone	1	unit	1,570.00
		6 zone	1	unit	2,750.00
11	Manual pull station.		1	unit	980.00
12	Fire curtain c/w actuator and wiring.		1	m2	150.00

5.2.6 OTHERS

No.	Description	Specification	Quantity	Unit	Price (RM)
1	Lockable hose reel cabinet.		1	unit	450.00
2	Hose reel drum c/w stop valve, shut-off nozzle and hose, etc.	Swing type	1	unit	500.00
		Fixed type	1	unit	475.00
3	Cradle each c/w canvas hose coupling jet and spray nozzle, etc.	Swing type	1	set	650.00
4	Sprinklers head.	Miniature	1	unit	110.00
		Conventional	1	unit	100.00
		Roof type	1	unit	150.00
5	Hot dipped galvanised pressed steel plates water tank per panel.	5mm	1	unit	400.00
		6mm	1	unit	470.00
6	Complete stainless steel non float electrodes c/w holder and wiring.		1	set	2,000.00
7	2.0 kg. portable fire extinguisher.	Carbon dioxide	1	unit	300.00
8	Hose reel pump test port c/w pressure switch, pressure gauges and wiring.		1	set	1,000.00
9	Alarm/sounder outside pump room .		1	unit	100.00
10	4-way breeching inlet cabinet c/w signage.		1	unit	500.00
11	4-way breeching inlet c/w additional pipe, fittings, valves and accessories.		1	unit	2,200.00
12	Canvas hose c/w jet and spray nozzle.		1	unit	400.00
13	Swing type cradle.		1	unit	250.00
14	9.0 kg. Portable fire extinguisher.	Dry powder	1	unit	250.00
15	Grease.		1	per kg	105.00

No.	Description	Quantity	Unit	Price (RM)
16	Galvanised steel/iron class C - under ground pipe works c/w valves, fittings, supports and hangers, pressure gauges, flow switches, alarm gongs, strainers, flexible couplings, pressure switches, automatic air release valves, butterfly valves, etc. (pre insulated bituminous factory wrapped externally)			
	1.1 1" Diameter	1	m	110.00
	1.2 1 1/4" Diameter	1	m	140.00
	1.3 1 1/2" Diameter	1	m	175.00
	1.4 2" Diameter	1	m	180.00
	1.5 2 1/2" Diameter	1	m	215.00
	1.6 3" Diameter	1	m	280.00
	1.7 4" Diameter	1	m	340.00
	1.8 6" Diameter	1	m	440.00

17	Galvanised steel/iron class C - above ground pipe works c/w valves, fittings, supports and hangers, pressure gauges, flow switches, alarm gongs, strainers, flexible couplings, pressure switches, automatic air release valves, butterfly valves, etc.			
	2.1 1/2" Diameter	1	m	45.00
	2.2 3/4" Diameter	1	m	50.00
	2.3 1 " Diameter	1	m	56.00
	2.4 1 1/4" Diameter	1	m	70.00
	2.5 1 1/2" Diameter	1	m	90.00
	2.6 2" Diameter	1	m	105.00
	2.7 2 1/2" Diameter	1	m	130.00
	2.8 3" Diameter	1	m	150.00
	2.9 4" Diameter	1	m	185.00
	2.10 6" Diameter	1	m	230.00
18	PVC cables in conduit			
	3.1 1 1/2 mm2	1	m	50.00
	3.2 2 1/2 mm2	1	m	80.00
	3.3 4 mm2	1	m	125.00
19	PVC/SWA/PVC Cable (Armored Cable)			
	4.1 4C x 1 1/2 mm2	1	m	30.00
	4.2 3C x 2 1/2 mm2	1	m	35.00
	4.3 4C x 2 1/2 mm2	1	m	70.00
	4.4 3C x 4 mm2	1	m	80.00
	4.5 3C x 4 mm2	1	m	100.00

(6)
SISTEM BEKALAN AIR SEJUK DALAMAN

(6.1)

KADAR HARGA BAGI SISTEM

6.1.1 BOOSTER PUMP SYSTEM

No.	Descriptions	Quantity	Unit	Price (RM)
1	Electric motor driven vertical multistage pump system (duty & standby) c/w starter, mountings, base plates, concrete plinths, neoprene pads etc.			
	1.5 Hp	2	nos	10,000.00
	2.0 Hp			15,000.00
	3.0 HP			25,000.00
	5.5 Hp			30,000.00
2	Control panel c/w conduits, cabling, control wiring between switchboard and various equipment (above and underground), automatic switches and controls, 30 A ammeter, voltmeter, overvoltage protector, earthing, pump hour run meter, 4P ELCB, phase light, TPN main isolator, storage tank indicator light, etc.	1	set	7,000.00
3	Glass-framed single line schematic circuit diagram, valve indicator etc.	1	set	550.00
4	Earthling & lightning surge protector minimum of 3 nos 10kA each.	1	set	2,000.00
5	Stainless steel non-float electrodes c/w holder and wiring, etc.	1	set	2,000.00
6	Piping (within plant room) c/w fittings, valves, supports, hangers, bracket, strainer, pressure gauge, flexible joint, drain pipe to the nearest drain, etc. for each pump system above.	1	lot	2,500.00

6.1.2 HYDROPNEUMATIC BOOSTER PUMP SYSTEM

No.	Descriptions	Quantity	Unit	Price (RM)
1	Electric motor driven pump system (duty & standby) c/w starter, mountings, base plates, concrete plinths, neoprene pads, etc.			
	0.75 Hp	2	nos	10,000.00
	1.5 Hp			12,000.00
	3.0 HP			18,000.00
	5.0 Hp			22,000.00
2	Control panel c/w conduits, cabling, control wiring between switchboard and various equipment (above and underground), automatic switches and controls, 30 A ammeter, voltmeter, overvoltage protector, earthing, pump hour run meter, 4P ELCB, phase light, TPN main isolator, storage tank indicator light, etc.	1	set	3,200.00
3	Glass-framed single line schematic circuit diagram, valve indicator etc.	1	set	350.00
4	Earthling & lightning surge protector minimum of 3 nos 10kA each.	1	set	2,000.00
5	Stainless steel non-float electrodes c/w holder and wiring, etc.	1	set	2,000.00
6	Piping (within plant room) c/w fittings, valves, supports, hangers, bracket, strainer, pressure gauge, flexible joint, drain pipe to the nearest drain, etc. for each pump system above.	1	lot	2,000.00

6.1.3 VARIABLES SPEED DRIVE PUMP SYSTEM

No.	Descriptions	Quantity	Unit	Price (RM)
1	Electric motor driven pump system (duty & standby) c/w starter, mountings, base plates, concrete plinths, neoprene pads, etc.	2	nos	
	1.0 Hp			20,000.00
	2.0 Hp			25,000.00
	2.5 HP			27,500.00
	3.0 Hp			35,000.00
2	Control panel c/w conduits, cabling, control wiring between switchboard and various equipment (above and underground), automatic switches and controls, 30 A ammeter, voltmeter, overvoltage protector, earthing, pump hour run meter, 4P ELCB, phase light, TPN main isolator, storage tank indicator light, etc.	1	set	10,000.00
3	Glass-framed single line schematic circuit diagram, valve indicator etc.	1	set	550.00
4	Earthling & lightning surge protector minimum of 3 nos 10kA each.	1	set	2,000.00
5	Stainless steel non-float electrodes c/w holder and wiring, etc.	1	set	2,000.00
6	Piping (within plant room) c/w fittings, valves, supports, hangers, bracket, strainer, pressure gauge, flexible joint, drain pipe to the nearest drain, etc. for each pump system above.	1	lot	2,500.00

(7)

**KADAR HARGA BAGI SISTEM
KELENGKAPAN KERUSI PERGIGIAN**

7.1 SISTEM KELENGKAPAN KERUSI PERGIGIAN

No.	Description	Quantity	Unit	Price (RM)
1	Dental Officer's Unit c/w all attachment and water filter	1	set	95,000.00
2	Dental Specialist Unit c/w all attachment and water filter	1	set	124,000.00
3	Piping work complete installation with all necessary attachments, valves and isolator switch			
	5.1 12mm Diameter	1	m	75.00
	5.2 15mm Diameter	1	m	80.00
	5.3 28mm Diameter	1	m	130.00
	5.4 35mm Diameter	1	m	200.00
	5.5 42mm Diameter	1	m	230.00
	5.6 54mm Diameter	1	m	300.00
6	Dental air grade compressed air system (one duty, one standby) c/w dryer system, air tank reservoir, fitting, pipework, plinth, dust filter etc			
	6.1 Capacity 500 lpm	1	set	160,000.00
7	Dry suction air system (one duty, one standby) c/w all fittings, pipework, bacterial air filter etc			
	7.1 Capacity 1500 lpm	1	set	60,000.00
8	Heavy duty water filter c/w accessories	1	set	5,000.00
9	Dental Technician Working Unit c/w dust extraction system, laboratory chair etc	1	set	40,000.00

(8)
KADAR HARGA BAGI SISTEM
LAPANG SASAR

8.1 SHOOTING RANGE SYSTEM

No.	Description		Quantity	Unit	Price (RM)	
1	<u>Shooting Range Equipment</u> The design,supply,install,testing and commissioning of the following c/w all necessary accessories as per employers requirements and specification					
1.1	Target System					
	1.1.1	Overhead retrievable target c/w railing,cable,inverter motor and target board holder	1	set	12,000.00	
	1.1.2	Flipping target (individual control)c/w inverter motor and target board holder	1	set	8,500.00	
	1.1.3	Target boards (600 x 600 x 5 mm blue colour polycarbonate board (PP Board) c/w 600mm x 600mm centre fire target paper	1	no	6.00	
	1.1.4	Control panel	1	lot	14,500.00	
	1.1.5	wiring for control panel	1	lot	1,000.00	
	1.1.6	1000mm high x 250 mm width protective berm consist of 500 x 250 x 250 mm rubber block c/w 75 mm x 6 thk mild steel plate for support bracket at back of rubber block	1	set	5,000.00	
1.2	Bullet containment /catcher					
	1.2.1	Bullet traps				
		a.Floor standing 9 mm back steel plate (14000mm x 3,000) complete with armour plate deflector	1	lot	42,000.00	
		b.Floor sanding steel frame (250mm X 500mm) consist of 50 x 100 x 4.5 mm thk hollow section frame as per dwg	1	lot	33,500.00	
		c.10mm thick 480 (L) x 3,000 (H) each premium rubber curtain for lanes long	1	lot	25,000.00	
		d.6mm thick 1,220 (L) x 3,000 (H) each premium rubber curtain 8 lanes long	1	lot	29,500.00	
		e.Bullet tray with caster (2000 x 3000 x 1080 mm)	1	lot	500.00	
		f.Bullet tray with caster (1500 x 300 x 1080mm)	1	lot	500.00	
	1.2.2	Shooting Booths				
		a.Supply ,install and maintain the shooting booths c/w transparent screen,fold down & fix counter with recess for weapon and ammunition,clips for score sheet & marker and control for retrieval target light switch,communication switch,support bracket and hanging post inclusive wall plug and painting	set	1	6,000.00	

(9)

KADAR HARGA BAGI SISTEM
GAS PERUBATAN

9.1 Medical Gas System (Oxygen)

No.	Description	Quantity	Unit	Price (RM)
A	<u>Central Medical Oxygen System</u>			
1	VIE tank c/w vaporizers and other associated equipment			
	1.1 Capacity: 10,000 L	1	set	158,000.00
2	VE Control Panel			
	2.1 Capacity: 10,000 L	1	set	19,000.00
3	Oxygen Automatic Changeover Manifold	1	set	57,000.00
4	Oxygen Automatic Changeover Emergency Standby Manifold			
	4.1 Capacity: 2 x 10 nos cylinder	1	set	28,000.00
	4.2 Capacity : 2 x 2 nos cylinder	1	set	11,000.00
	4.3 Capacity : 2 x 4 nos cylinder	1	set	12,000.00
5	Cylinder Spare c/w spare rack	1	nos	1,400.00
6	Excavation Work c/w bracket & fittings, corings, making good etc	1	lot	10,000.00
7	Signage, Gas Marker, arrow mark gas flow etc	1	lot	4,000.00
8	Electrical and earthing work	1	lot	5,000.00

9.2 Compressed Air System (MA4)

No.	Description	Quantity	Unit	Price (RM)
B	<u>Compressed Air System (MA4)</u>			
1	Medical Air Compressor System c/w accessories			
	1.1 Capacity: 4,095 LPM	1	set	230,000.00
	1.2 Capacity : 240 LPM	1	set	166,000.00
2	Medical Air 4 bar automatic change- Over c/w accessories	1	set	48,000.00
3	Medical Air 4 bar automatic change- Over,emergency supply manifold	1	set	11,000.00
4	Electrical & Earthing Work	1	lot	3,000.00
5	Automatic Changeover Emergency Standby Manifold			
	6.1 Capacity: 2 x 10 nos cylinder	1	set	24,300.00
6	Cylinder MA4 c/w spare rack	1	nos	1,300.00
7	Certification and approval by the authorities	1	lot	2,600.00
8	Excavation Work c/w bracket & fittings, corings, making good etc	1	lot	2,000.00
9	Signage, Gas Marker, arrow mark gas flow etc	1	lot	1,000.00

9.3 Central Medical Vacuum System

No.	Description	Quantity	Unit	Price (RM)
C	<u>Vacuum</u>			
1	Medical Vacuum System			
	1.1 Capacity: 2,400 LPM	1	set	125,500.00
	1.2 Capacity : 310 LPM	1	set	95,000.00
	1.3 Capacity : 330 LPM	1	set	78,000.00
2	Electrical and Earthing Work	1	lot	3,200.00
3	Certification and approval by the authorities	1	lot	3,000.00

9.4 Central Entonox Gas System

No.	Description	Quantity	Unit	Price (RM)
D	<u>Central Entonox Gas System</u>			
1	Entonox Automatic Change Over Manifold System c/w accessories			
	1.1 Capacity: 2 x 6 nos cylinder	1	set	18,900.00
	1.2 Capacity: 2 x 2 nos cylinder	1	set	7,100.00
2	Entonox Cylinder c/w spare rack	1	no	350.00
3	Electrical and Earthing Work	1	lot	2,200.00

9.5 Central Nitrous Oxide System

No.	Description	Quantity	Unit	Price (RM)
C	<u>Central Nitrous Oxide System</u>			
1	Nitrous Oxide Change-over manifold system c/w accessories			
	1.1 Capacity: 2 x 4 nos cylinder	1	lot	30,000.00
	1.2 Capacity: 2 x 2 nos cylinder	1	lot	7,100.00
2	Nitrous Oxide Cylinder c/w spare rack	1	no	1,700.00
3	Electrical and earthing work	1	lot	2,100.00
4	Excavation Work c/w bracket & fittings, corings, making good etc	1	lot	2,000.00
5	Signage, Gas Marker, arrow mark gas flow etc	1	lot	1,000.00

9.6 Anaesthetic Gas Scavenging System (AGSS)

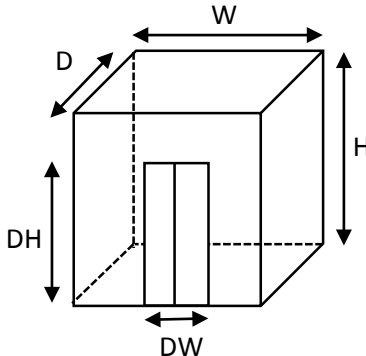
No.	Description	Quantity	Unit	Price (RM)
A	<u>AGSS System</u>			
1	Duplex AGSS Pump c/w accessories			
	1.1 Capacity: 390 LPM	1	lot	31,000.00
	1.2 Capacity: 130 LPM	1	lot	35,000.00
2	Electrical and Earthing Work	1	lot	3,100.00

9.7 Others

No.	Description	Quantity	Unit	Price (RM)
1	Medical Gases , Oxygen, Compressed Air (4 Bar), Vacum & Extonox Terminal Unit	1	no	400.00
2	Bedhead Panel Unit c/w terminal unit, fittings and railing (Medirail above and below)	1	no	1,500.00
3	Ceiling Mounted Pendant			
	3.1 1 Dry, 1 Wet Pendant	1	no	41,500.00
	3.2 1 Dry, 1 Wet, 1 surgeon Pendant	1	no	53,000.00
4	Indication Panel, visual Alarm Indicators, Wiring	1	no	6,700.00
5	Provision on center indicator Alarm panel Repeater at main Control Room c/w, accesseries etc	1	no	6,200.00
6	Area Valve Service Unit (AVSU)	1	no	6,000.00
7	Line Valve / Lockable Line Valve	1	no	450.00
8	Pipework installed c/w hangers, fittings etc for Oxygen, Nitrous Oxide, Entonox, MA4, Vacuum and AGSS			
	8.1 12mm Diameter	1	meter	75.00
	8.2 15mm Diameter	1	meter	80.00
	8.3 22mm Diameter	1	meter	100.00
	8.4 28mm Diameter	1	meter	130.00
	8.5 35mm Diameter	1	meter	200.00
	8.6 42mm Diameter	1	meter	230.00
	8.7 54mm Diameter	1	meter	300.00
	8.8 76mm Diameter	1	meter	450.00
	8.9 108mm Diameter	1	meter	630.00
9	Painting of the complete installation	1	set	10,000.00
10	Testing & Comissioning	1	set	15,000.00

(10)
KADAR HARGA BAGI SISTEM LIF

10.1 SISTEM LIF

No.	Description	Unit Price (A)	Formula
1	Lift Car(s) inclusive of all Panels and Attachments*		
	➤ hairline stainless steel	RM 4,000.00	Price = A x area** x lift quantity
	➤ stainless steel rigidised	RM 5,500.00	
	➤ mirror etched	RM 8,000.00	
2	Landing Doors including Frames, Sills		Price = A x door area*** x stops x lift quantity
	➤ center opening	RM 1,700.00	
	➤ side opening	RM 2,000.00	
	* The prices shown are based on aluminium chequered plate / homogenous tiles flooring type ** Area = (2 x D x H) + (W x H) *** Door Area = DW x DH 		
3	Hall Lantern(s), Position Indicators, Call Buttons	RM 1,500.00	Price = A x stops x lift quantity
4	Traction Machine(s) c/w Sheaves, Regenerative Drives		
	➤ geared	RM 10.00	Price = A x speed x capacity x lift quantity
	➤ gearless	RM 40.00	
5	Governors and Ropes		
	➤ > 3 mm rope diameter	RM 300.00	Price = A x (travel distance + overhead + pit depth) x lift quantity
	➤ 6 mm	RM 310.00	
	➤ 8 mm	RM 350.00	
6	Controllers and shaft information	RM 35,000.00	Price = A x lift quantity
7	Traveling cables and its accessories	RM 650.00	Price = A x travel distance x lift quantity
8	Electrical Switchboards	RM 8,000.00	Price = A x Number of Machine Room
9	Cables and Wiring	RM 7,500.00	Price = A x lift quantity
10	Intercom System	RM 5,500.00	Price = A x lift quantity
11	Central Supervisory Panel		
	➤ computerized	RM 6,200.00	Price = A x lift quantity
	➤ analog	RM 7,300.00	

12	Batteries with Trickle Chargers	RM 3,500.00	Price = A x lift quantity
13	Car Buffers	RM 4.00	Price = A x speed x capacity x lift quantity
14	Counterweight Buffers	RM 2.50	Price = A x speed x capacity x lift quantity
15	Counterweights	RM 7.50	Price = A x capacity x lift quantity
16	Guide rails and attachments	RM 800.00	Price = A x (travel distance + overhead + pit depth) x lift quantity
17	Traction Ropes		
	➤ >10mm	RM 150.00	Price = A x (travel distance + overhead + pit depth) x no. of ropes x lift quantity
	➤ 10mm	RM 100.00	
	➤ 8mm	RM 80.00	
18	Rope Snatch Switch	RM 8,000.00	Price = A x lift quantity
19	Automatic Rescue Device (ARD)	RM 8,500.00	Price = A x lift quantity
20	Emergency Battery Operated Power Supply (EBOPS)	RM 5,800.00	Price = A x lift quantity
21	Car Locking Devices	RM 5,000.00	Price = A x lift quantity
22	Lightning and Surge Protectors	RM 4,400.00	Price = A x lift quantity
23	Cat Ladder Inside Lift Pit	RM 1,400.00	Price = A x lift quantity
24	New wiring, socket outlet and lighting inside lift pit	RM 800.00	Price = A x lift quantity
25	Installation (According to the Installation Schedule)	RM 2,700.00	Price = A x stops x lift quantity
26	Exhaust Fans c/w accessories	RM 3.00	Price = A x cfm capacity x number of machine room
27	Voice Synthesizer	RM 2,800.00	Price = A x lift quantity
28	Handrail	RM 4,600.00	Price = A x lift quantity
29	Car Operating Panel (COP) for the Disable	RM 8,500.00	Price = A x lift quantity
30	Testing and Commissioning	RM 4,000.00	Price = A x lift quantity

- all dimensions are in meter (m)

(11)

KADAR HARGA BUILDING AUTOMATION SYSTEM (BAS)

11.1 BUILDING AUTOMATION SYSTEM (BAS)

No.	Description	Unit	Price (RM)
1	One complete building automation system software c/w password required for the operation of the CWS, NCUs and DDCs. (included licence)	set	13,000.00
2	One lot of main PC Operator workstation c/w hard disk drive, RAM, keyboard, Ethernet LAN card, Mouse, LCD colour monitor, and all necessary devices and accessories as per specifications in section 5 item 6.	set	7,000.00
3	System software - Latest windows (operating system and compatible with building automation system	set	2,000.00
4	One unit of operator report and alarm laser printer c/w all necessary devices and accessories	set	3,500.00
5	Network controller unit (duty and standby configuration) c/w all necessary accessories	unit	40,500.00
6	Stand alone digital direct controllers (DDCs) c/w battery backup, real time hardware clock and all necessary accessories as per BAS I/O point schedule	unit	5,000.00
7	Temperature sensor, pressure sensor, relative humidity (RH) sensor, high/ low lever sensor, pressure switches, air flow switches, etc. and interfacing equipment c/w all necessary devices and accessories to make overall BAS system working as per BAS I/O	unit I/O point	38.00
8	Transducers / digital power meter c/w all necessary devices and accessories to make overall BAS system working as per BAS I/O point schedule	Lot	1,000.00
9	Flowmeter c/w all necessary devices and accessories to make overall BAS system working as per BAS I/O point schedule	Lot	7,000.00
10	One complete solid-state uninterruptible power supply c/w sealed lead acid batteries and all necessary devices and accessories	Lot	3,000.00
11	Preparation of sub-program for colour graphic diagrams, display, each system simulation and chiller lead-lag operation to suit with application requirement as in BAS specifications (section 3, item 1.1)	Lot	14,000.00
12	One lot of operator room console (table for CWS and printer, chairs and etc)	Lot	6,000.00
13	One lot of cabling (i.e. CAT 6, CAT 5E, 24 AVG etc.) c/w conduits, trappings and all necessary accessories as per BAS I/O point schedule	unit foot run	50.00
14	One lot of approved type hangers, supports, brackets c/w all necessary accessories (stainless steel type).	Lot	3,000.00
15	One lot pipe sleeves and fire rated sealing compound for all RC slabs and walls including all necessary accessories	Lot	2,000.00

(12)

KADAR HARGA PUKAL BAGI SISTEM MEKANIKAL

12.1 A. SISTEM PENYAMAN UDARA

BIL	SISTEM	UNIT	HARGA (RM)
1	Air Cooled Split Unit (Wall Mounted)		
	9,000 Btu/Hr (1.0 Hp)	Per No.	2,000.00
	13,000 Btu/Hr (1.5 Hp)	Per No.	2,300.00
	18,000 Btu/Hr (2.0 Hp)	Per No.	3,100.00
	24,000 Btu/Hr (2.5 Hp)	Per No.	3,700.00
	27,000 Btu/Hr (3.0 Hp)	Per No.	4,100.00
	Air Cooled Split Unit (Ceiling Mounted)		
	9,000 Btu/Hr (1.0 Hp)	Per No.	2,700.00
	13,000 Btu/Hr (1.5 Hp)	Per No.	3,200.00
	18,000 Btu/Hr (2.0 Hp)	Per No.	3,800.00
	24,000 Btu/Hr (2.5 Hp)	Per No.	4,500.00
	27,000 Btu/Hr (3.0 Hp)	Per No.	5,200.00
	30,000 Btu/Hr (3.5 Hp)	Per No.	6,200.00
	40,000 Btu/Hr (4.0 Hp)	Per No.	7,000.00
	50,000 Btu/Hr (5.0 Hp)	Per No.	7,800.00
	60,000 Btu/Hr (6.0 Hp)	Per No.	8,800.00
	Air Cooled Split Unit (Ceiling Cassette)		
	13,000 Btu/Hr (1.5 Hp)	Per No.	4,200.00
	18,000 Btu/Hr (2.0 Hp)	Per No.	4,800.00
	24,000 Btu/Hr (2.5 Hp)	Per No.	5,200.00
	27,000 Btu/Hr (3.0 Hp)	Per No.	6,100.00
	35,000 Btu/Hr (3.5 Hp)	Per No.	7,500.00
	40,000 Btu/Hr (4.0 Hp)	Per No.	7,800.00
	50,000 Btu/Hr (5.0 Hp)	Per No.	8,300.00
2	Air Cooled Split Ducted System	Per TR	5,000.00
3	Air Cooled Split Ducted System (Projek Hospital)	Per TR	6,500.00
4	Water Cooled Packaged System	Per TR	5,500.00
5	Air Cooled Chiller System	Per TR	6,500.00
6	Air Cooled Chiller Projek Hospital	Per TR	7,000.00
7	Water Cooled Chiller System	Per TR	7,500.00
8	Water Cooled Chiller System (Projek Hospital)	Per TR	14,000.00
9	Air Cooled VRF System	Per TR	6,500.00
10	Air Cooled Modular Chiller	Per TR	5,000.00
11	Precision Air Conditioning (Raised floor Type)	Per TR	11,000.00
12	Building Automation System (Wired Type)	Per Point	500.00
13	Building Automation System (Wireless Type)	Per Point	700.00
14	Ventilation System	Per CFM	3.00
15	Smoke Spill System	Per CFM	2.00
16	Pressurized System	Per CFM	2.20

Nota:

1. Kaedah pemilihan peralatan mestilah di ambil kira unit yang lebih besar. Contoh: Kapasiti reka bentuk penyaman udara wall mounted 17,000 Btu/hr perlu memilih kadar harga peralatan berkapasiti 18,000 Btu/hr.
2. Jadual ini sebagai rujukan bagi menyediakan anggaran awalan untuk projek baru.
3. TR – *Tonne Refrigerant / Ton of Refrigeration*.
4. 1 HP – 9,000 Btu/hr
5. 1 TR (*Tonne Refrigerant*) – 12,000 Btu/hr

B. PERALATAN PENYAMAN UDARA

BIL.	SISTEM	UNIT	HARGA (RM)
1	Water Cooled Chiller Unit	Per TR	1,900.00
2	Air Cooled Chiller Unit	Per TR	1,900.00
3	Cooling Tower Unit	Per TR	130.00
4	Condenser Water Pump	Per TR	100.00
5	Chilled Water Pump	Per TR	80.00
6	Make Up Water Tank	Per Gallon	4.00
7	Expansion Tank	Per Gallon	13.00
8	Chilled Water Pipe	Per TR	1,300.00
9	Condenser Water Pipe	Per TR	420.00
10	AHU/FCU (Water Cooled)	Per TR	1,400.00
11	AHU/FCU (Air Cooled)	Per TR	600.00
12	Switchboard (Water Cooled)	Per TR	310.00
13	Switchboard (Air Cooled)	Per TR	470.00
14	Switchboard (Inverter Unit)	Per TR	1,700.00
15	Ducting (Sheet Metal C/W Fibreglass)	Per TR	1,100.00
16	DUCTING (FIBREGLASS)	PER FT2 AIR CONDITIONING AREA (GFA)	2.50
17	DUCTING [POLYETHYLENE (PE) INSULATION]	PER FT2 AIR CONDITIONING AREA (GFA)	5.50
18	DUCTING (BARE DUCT)	PER FT2 AIR CONDITIONING AREA (GFA)	2.00

Note:-

1. Jadual ini sebagai rujukan bagi menyediakan anggaran awalan untuk projek ubah suai.
2. Anggaran harga *ducting* termasuk *supply diffusers* dan *returns grilles*.
3. TR – *Tonne Refrigerant*.
4. GFA – *Gross Floor Area*.

12.2 SISTEM PENCEGAH KEBAKARAN

BIL.	SISTEM	FORMULA	NOTA
1	HOSE REEL SYSTEM	$[RM40,000 + (AREA/800m^2) \times RM500 + KOS\ PEPAIPAN^{**}]$	GFA
2	DRY RISER SYSTEM	$[(BILANGAN\ LANDING\ VALVE \times RM\ 1,200) + (NO.\ BREECHING\ INLET \times RM2,200) + KOS\ PEPAIPAN^{**}]$	GFA
3	WET RISER SYSTEM	$[RM120,000 + (BIL.\ LANDING\ VALVE \times RM1200) + KOS\ PEPAIPAN^{**}]$	GFA
4	SPRINKLER SYSTEM	$(AREA\ SINGLE\ LAYER/12m^2) \times RM400$	KOS SINGLE LAYER (GFA)
		$KOS\ SINGLE\ LAYER + [(AREA\ DOUBLE\ LAYER/12m^2) \times RM250]$	KOS DOUBLE LAYER (GFA)
5	CLEANT AGENT TOTAL FLOODING SYSTEM	$(VOLUME\ m^3 \times RM250) + RM150\ PER\ FIRE\ CURTAIN\ m^2 + RM17,000$	GFA
6	CONVENTIONAL ALARM SYSTEM	$[(FLOOR\ AREA/5.6m^2) \times RM300 + RM10,000]$	GFA
7	ADDRESSABLE ALARM SYSTEM	$[(FLOOR\ AREA/5.6m^2) \times RM500 + RM30,000]$	GFA

Nota:

1. ****Anggaran kos pepaipan** hendaklah di kira secara berasingan.
2. Jadual ini sebagai rujukan bagi menyediakan anggaran awalan untuk projek baru.
3. GFA – *Gross Floor Area*.
4. Jika pemasangan melibatkan kawasan double layer, kos pemasangan single layer hendaklah di ambil kira sekali bagi Sistem Sprinkler.

12.3 SISTEM LIF

BIL.	BANGUNAN	HARGA LIF	HARGA LANDING PER FLOOR	HARGA KESELURUHAN (RM)
1	PEJABAT	325,000	10,000	HARGA LIF + (NO. OF LANDING X HARGA LANDING PER FLOOR)
2	KUARTERS	280,000	8,000	
3	HOSPITAL	350,000	20,000	
4	DUMBWAITER	60,000	3,500	
5	LIF BARANG	320,000	8,000	

Nota:

1. Jadual ini sebagai rujukan bagi menyediakan anggaran awalan untuk projek baru.
2. Harga ini adalah berdasarkan kelajuan 1.0 – 2.0 m/s dan beban muatan 10 – 20 orang penumpang.
3. Harga ini adalah berdasarkan jenama yang popular di pasaran.

12.4 SISTEM BEKALAN AIR SEJUK DAN SANITARI DALAMAN

BIL.	SISTEM	FORMULA
1	SISTEM BEKALAN AIR SEJUK (ABS PIPE)	RM30/m ² (GFA)
2	SISTEM BEKALAN AIR SEJUK (STAINLESS STEEL PIPE)	RM55/m ² (GFA)
3	TANGKI SEDUTAN/DOMESTIK	RM8/GALLON
4	SANITARI DALAMAN (ABS PIPE)	RM20/m ² (GFA)

Nota:

1. Jadual ini sebagai rujukan bagi menyediakan anggaran awalan untuk projek baru.
(GFA) – *Gross Floor Area*.
2. Kadar harga adalah termasuk harga peralatan yang berkualiti dan berjenama, upah, pengangkutan, keuntungan, tempoh jaminan, pengujian & pentauliahan serta senggaraan dalam tempoh jaminan.

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RUJUKAN

Senarai Rujukan

- 12.1 Panduan Maklumat Kos Binaan JKR 2016 – Penyediaan Anggaran Kos Awalan
- 12.2 Garis Panduan Anggaran Harga Sistem Mekanikal Dalam Bangunan Tahun 2013
- 12.3 Harga Pembekal.
- 12.4 Input Teknikal daripada Bengkel Jawatankuasa Pangkalan Data Harga Mekanikal .
- 12.5 Input Teknikal Dari JKR Mekanikal Negeri.
- 12.6 Laman Web Berkaitan.
- 12.7 Dokumen Kontrak 2014-2017 (Mekanikal).
 - Sistem Penyaman Udara dan Pengudaraan Mekanikal untuk Ibu Pejabat Pertahanan Awam Malaysia (IPPA) Sungai Merab, Sepang, Selangor
 - Sistem Penyaman Udara dan Pengudaraan Mekanikal untuk Pembinaan Pejabat Daerah Pertahanan Awam Langkawi, Kedah
 - Sistem Penyaman Udara dan Pengudaraan Untuk Pembinaan Ibu Pejabat Polis Daerah (IPD) Kota Setar, Kedah
 - Sistem Penyaman Udara dan Pengalihudaraan Untuk Cadangan Pembinaan Bangunan Integrasi Yang Mengandungi Perpustakaan Dewan Kuliah, Pusat Aktiviti Pelajar Dan Pejabat Di Kolej Poly-Tech Mara (KPTM) Bangi, Selangor
 - Sistem Penyaman dan Pengalihan Udara Untuk Cadangan Membina & Menyiapkan Klinik Kesihatan Jenis 3 (Teja CR) Dan Kuarters 2F&2G Di Batu 14, Puchong, Daerah Petaling, Selangor
 - Sistem Penyaman Udara & Pengudaraan Mekanikal Untuk Unimap - Pembinaan Bangunan Bagi Jabatan Hal Ehwal Pelajar dan Alumni dan Jabatan Pembangunan
 - Sistem Penyaman Udara dan Pengudaraan Untuk Universiti Islam Antarabangsa Malaysia (UIAM) - Pembinaan Bangunan Kuliyyah Kejururawatan, Kampus Kuantan, Pahang
 - Sistem Penyaman Udara dan Pencegah Kebakaran Untuk Cadangan Pembinaan Balai Polis Debak, Betong, Sarawak
 - Sistem Penyaman dan Pengalihan Udara Untuk Cadangan Klinik Kesihatan Jenis 3 (Teja-CR) Dengan Kuarters (2F,2G) Karak, Bentong, Pahang
 - Sistem Penyaman Udara Dan Pengalihudaraan Untuk Naiktaraf Kompleks Majlis Sukan Negara
 - Sistem Penyaman Udara Dan Pengudaraan Mekanikal Untuk Meroboh Dan Membina Semula Kompleks Pekan Rabu, Alor Setar, Kedah
 - Sistem Penyaman Udara dan Pengudaraan Mekanikal Untuk Cadangan Kerja-Kerja Naiktaraf dan Baikpulih Bangunan Parlimen Malaysia (Fasa 3B)
 - Sistem Penyaman dan Pengalihan Udara Untuk Cadangan Klinik Kesihatan Jenis, Nilai, Negeri Sembilan (One Off) (Fasa 2 - Klinik Kesihatan 3 dan Kerja Lain Berkaitan)
 - Sistem Penyaman Udara dan Pengudaraan Mekanikal Untuk Ibu Pejabat Jabatan Bomba dan Penyelamat Malaysia Negeri Kedah - Fasa II (Kerja-Kerja Bangunan)

- Sistem Penyamanan dan Pengalihan Udara Untuk Membina Blok Psikiatrik Hospital Sultanah Nur Zahirah, Kuala Terengganu Fasa 2: Kerja Bangunan dan Lain-Lain Kerja Berkaitan
- Sistem Penyaman Udara dan Sistem Pencegah Kebakaran Untuk Meroboh dan Membina Semula Bangunan Auditorium Di Atas Sebahagian Lot 60016 (Asal Lot 2359 & 2360) Mukin Ulu Melaka Daerah Langkawi, Kedah
- Sistem Penyamanan Dan Pengudaraan Mekanikal Untuk Membina dan Menyiapkan Klinik Kesihatan Jenis 3 (Teja) Dengan Kuarters Di Atas Lot 1487 & 1488, Mukim Ayer Molek, Daerah Melaka Tengah, Melaka
- Sistem Penyaman Udara dan Pengudaraan Untuk Tender Semula Untuk Kerja-Kerja Pembinaan Balai Polis Contry Homes, Selangor
- Sistem Penyaman Udara dan Pengudaraan untuk Pembinaan Ibu Pejabat Polis Daerah (IPD) Nusajaya, Johor
- Sistem Penyaman Udara, Sistem Pengudaraan Mekanikal, Sistem Pencegah Kebakaran dan Kerja-Kerja Berkaitan Untuk Pembinaan Mahkamah Baharu Tapah, Perak
- Sistem Pencegah Kebakaran Untuk Universiti Sultan Zainal Abidin (UniSZA) - Pembinaan Bangunan Akademik Dan Pentadbiran Kampus Besut, Terengganu
- Sistem Pencegah Kebakaran Untuk Ibu Pejabat Pertahanan Awam Malaysia (IPPA) Sungai Merab, Sepang, Selangor
- Sistem Pencegah Kebakaran Untuk Cure & Care Rehabilitation Centre (CCRC) Dan Klinik Cure & Care (C & C) 1Malaysia Di Kuching, Sarawak
- Sistem Pencegah Kebakaran Untuk Cadangan Kerja-Kerja Naiktaraf Dan Baikpulih Bangunan Parlimen Malaysia (Fasa 3B)
- Sistem Pencegah Kebakaran Dan Pam Penggalak Untuk Membina Blok Psikiatrik Hospital Sultanah Nur Zahirah, Kuala Terengganu Fasa 2: Kerja Bangunan Dan Lain-Lain Kerja Berkaitan
- Sistem Pencegah Kebakaran Untuk Pembinaan Pejabat Daerah Pertahanan Awam Langkawi, Kedah
- Sistem Pencegah Kebakaran Dan Pam Penggalak Untuk Cadangan Pembinaan Bangunan Integrasi Yang Mengandungi Perpustakaan, Dewan Kuliah, Pusat Aktiviti Pelajar Dan Pejabat Di Kolej Poly-Tech Mara (KPTM) Bangi, Selangor
- Sistem Pencegah Kebakaran Untuk Naiktaraf Kompleks Majlis Sukan Negara
- Sistem Pencegah Kebakaran Untuk Ibu Pejabat Jabatan Bomba Dan Penyelamat Malaysia Negeri Kedah - Fasa II (Kerja-Kerja Bangunan)
- Sistem Kelengkapan Unit Pergigian Untuk Cadangan Membina & Menyiapkan Klinik Kesihatan Jenis 3 (Teja CR) dan Kuarters 2F&2G Di Batu 14, Puchong, Daerah Petaling, Selangor
- Sistem Air Panas dan Heat Pump Untuk Membina Blok Psikiatrik Hospital Sultanah Nur Zahirah, Kuala Terengganu Fasa 2: Kerja Bangunan dan Lain-Lain Kerja Berkaitan
- Sistem Kelengkapan Dapur Untuk Cure & Care Rehabilitation Centre (CCRC) Dan Klinik Cure & Care (C&C) 1Malaysia Di Kuching, Sarawak

- Sistem Gas Perubatan Untuk Membina Blok Psikiatrik Hospital Sultanah Nur Zahirah, Kuala Terengganu Fasa 2: Kerja Bangunan dan Lain-Lain Kerja Berkaitan
- Sistem Peralatan Bengkel Untuk Pembinaan Ibu Pejabat Polis Daerah (IPD) Johor Bahru selatan, Johor
- Sistem Liquefied Petroleum Gas (LPG) Untuk Cadangan Pembangunan Pusat Pemprosesan Dan Pengeluaran Produk Kenaf Di Saujana Setiu, Terengganu
- Sistem Target Menembak Lapangasar Tertutup 25M Untuk Ibu Pejabat Polis Daerah Nilai, Negeri Sembilan
- Sistem Target Menembak Lapangasar Tertutup Untuk Pembinaan Ibu Pejabat Polis Daerah (IPD) Kota Setar, Kedah
- Sistem Kolam Renang Untuk Cadangan Pembinaan Kolam Renang Di Kompleks Sukan Tawau, Sabah
- Sistem Target Menembak Lapangasar Tertutup 25M Untuk Pembinaan Ibu Pejabat Polis Daerah (IPD) Johor Bahru Selatan, Johor
- Sistem Lif Untuk Ibu Pejabat Polis Daerah Nilai, Negeri Sembilan
- Sistem Lif Untuk Ibu Pejabat Pertahanan Awam Malaysia (IPPA) Sungai Merab, Sepang, Selangor
- Sistem Lif Dan Eskalator Untuk Cadangan Membina Parkway Drop Zone Di Stesen Komuter Serdang
- Sistem Lif Untuk Membina Dan Menaiktaraf Kuarters Institusi JKM Di Desa Bina Diri (DBD) Mersing, Johor
- Sistem Lif Untuk Ibu Pejabat Jabatan Bomba & Penyelamat Malaysia Wilayah Persekutuan Labuan
- Sistem Lif Untuk Cadangan Kerja-Kerja Naiktaraf Dan Baikpulih Bangunan Parlimen Malaysia (FASA 3B)
- Sistem Lif Untuk Membina Blok Psikiatrik Hospital Sultanah Nur Zahirah, Kuala Terengganu Fasa 2 : Kerja Bangunan Dan Lain-Lain Kerja Berkaitan
- Sistem Lif Untuk Universiti Malaysia Perlis (UniMAP) - Pembinaan Bangunan Pentadbiran Canselor
- Sistem Lif Untuk Membina Klinik Kesihatan (Jenis 3) Gombak Setia, Gombak, Selangor
- Sistem Lif Untuk Pembinaan Semula Kuarters Imigresen Pangkalan Hulu, Perak
- Sistem Lif Untuk Pembinaan Ibu Pejabat Polis Daerah (IPD) Johor Bahru Selatan, Johor
- Sistem Lif Untuk Pembinaan Semula Kuarters Kakitangan Di Institusi Jabatan Kebajikan Masyarakat (JKM) Di Taman Sinar Harapan Tampoi, Johor
- Sistem Lif Untuk Cadangan Klinik Kesihatan Jenis 3 Nilai, Negeri Sembilan (One Off) (Fasa 2 - Klinik Kesihatan 3 Dan Kerja lain Berkaitan)
- Sistem Lif Untuk Menyiapkan Baki Kerja Ilaj Home Di Mukim Bandar, Kuala Lumpur
- Sistem Lif Untuk Pembinaan Kuarters Depot Tahanan Imigresen Belantik, Kedah

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PENGHARGAAN

PENAUNG

Ir. Gopal Narian Kutty *JMW, AMN*

PENASIHAT

Ir. Razdwan bin Kasim
Ir. Mamat Rohizan bin Abdullah

PENYELARAS

Pn. Azizun Binti Hashim
En. Amirrudin bin Mohamed

AHLI JAWATANKUASA

Ir. Ismail bin A.Rahman
Ir. Zulkifli bin Abdul Rashad
Ir. Azizah Binti Kassim
Ir. Zalina Binti Mohd Yusuf
Cik Noor'Ain Binti Zainal Abidin
Ir. Yatim Selamat Bin Latib
Ir. Hj. Hasbullah Bin Osman
En.Ahmad Zaki Bin Bahari
En. Amirudin Bin Mohamad Ali
Ir. Dr. Tuan Suhaimi Bin Salleh
Ir. Wan Shah Waliallah Bin Wan Senik
Ir. Mohd Azmi Bin Hashim
En. Faiz Bin Fadzil
En. Asrul Nizam Bin Abd Lah
Ir. Mohd Maarif Bin Abdul Malik
Pn. Sharifah Dzain Binti Syed Yusof
En. Addy Shahelmy Bin Abdul Salam
En. Mohamad Hafez Bin Khairan
En. Mohd Hairie Bin Abdul Halim
Ir. Abdul Qayyum bin Abdul Halim
En. Mohd Zamri Bin Abd Manaf
En. Abdul Hafiz bin Abd Hamid
En. Osman bin Abdul Wahid
En. Aidil Muzamil Bin Jalani
En. Wan Mohd Sulhanizan Bin Wan Sulaiman
En. Wan Ismail Bin Wan Yusof
En. Wan Hisham bin Wan Mansor