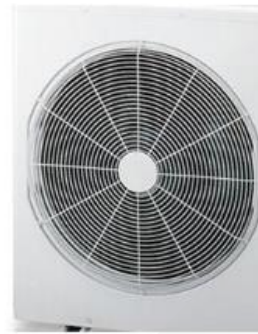




JADUAL KADAR KERJA MEKANIKAL 2021



**KETUA PENGARAH KERJA RAYA
IBU PEJABAT JKR MALAYSIA
KUALA LUMPUR**

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Jabatan Kerja Raya Malaysia

Hak Cipta Terpelihara. Tiada bahagian daripada terbitan ini boleh diterbitkan semula, disimpan untuk pengeluaran atau ditukar ke dalam sebarang bentuk atau dengan sebarang alat jua pun, sama ada dengan cara elektronik, gambar serta rakaman dan sebagainya tanpa kebenaran bertulis daripada Pengarah Kanan Cawangan Kejuruteraan Mekanikal, Ibu Pejabat JKR Malaysia.



KETUA PENGARAH KERJA RAYA
DIRECTOR-GENERAL OF PUBLIC WORKS

Rujukan: JKR.KPKR:121.010/05 Jld. 23 (4)

Tarikh : 6 April 2021

Semua Pengarah Kanan / Pengarah Cawangan Ibu Pejabat JKR
Semua Pengarah Kerja Raya Negeri
Semua Pengarah Kerja Raya Wilayah Persekutuan
Semua Pengarah Pembinaan
Pengarah JKR Unit Khas
Pengarah JKR KESEDAR
Pengarah JKR KETENGAH
Semua Jurutera Daerah

SURAT ARAHAN KPKR BIL. 9 / 2021

**ARAHAN PENGGUNAAN JADUAL KADAR KERJA MEKANIKAL 2021 UNTUK
KERJA-KERJA KECIL MEKANIKAL DAN PENYENGGARAAN MEKANIKAL**

1.0 TUJUAN

Surat Arahan ini bertujuan untuk memaklumkan arahan penggunaan **Jadual Kadar Kerja Mekanikal 2021 (JKK Mekanikal 2021)** untuk kerja-kerja kecil mekanikal dan penyenggaraan mekanikal yang telah diluluskan oleh Kementerian Kewangan melalui surat bil. MOF.BPK(S)600-1/3/32 JLD. 2 (10) bertarikh 17 Mac 2021, berkuat kuasa selama tempoh tiga (3) tahun mulai 1 April 2021 hingga 31 Mac 2024.

1/4

Jabatan Kerja Raya Malaysia

Public Works Department Malaysia

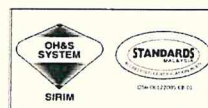
Aras 33, Menara Kerja Raya, Ibu Pejabat JKR Malaysia, Jalan Sultan Salahuddin, 50480 Kuala Lumpur
Tel.: 03-2618 8421 Faks: 03-2618 8799 <https://www.jkr.gov.my>



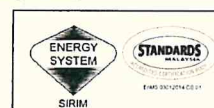
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CERTIFIED TO ISO 14001:2015
CERT. NO.: EMS 00227



CERTIFIED TO ISO 45001:2018
CERT. NO.: OHS 00604



CERTIFIED TO ISO 50001:2018
CERT. NO.: EnMS 00111

2.0 LATAR BELAKANG

- 2.1 Bagi semua perolehan kerja-kerja kecil mekanikal dan penyenggaraan mekanikal secara Lantikan Terus dan *Requisition* sebelum ini hanya merujuk kepada kajian pasaran.
- 2.2 Bagi tujuan penyeragaman kadar harga, Cawangan Kejuruteraan Mekanikal telah menubuhkan satu Jawatankuasa Pembangunan Jadual Kadar Kerja Mekanikal bagi membangunkan dan menyediakan Jadual Kadar Kerja Mekanikal 2021 sebagai garis panduan kadar kerja bagi kerja pemasangan baharu dan pembaikan peralatan/sistem mekanikal dalam bangunan selaras dengan keperluan dan spesifikasi semasa.
- 2.3 Jadual Kadar Kerja Mekanikal 2021 ini telah dikemukakan kepada Kementerian Kewangan bagi tujuan kelulusan untuk menjadikan sebagai dokumen rujukan dalam menyediakan anggaran harga untuk Kerja Undi, Lantikan Terus dan *Requisition* sistem mekanikal.

3.0 KAEDAH PELAKSANAAN

- 3.1 Dengan Surat Arahan ini, **SEMUA** kadar harga kerja-kerja kecil mekanikal dan penyenggaraan mekanikal bagi perolehan kerajaan secara Kerja Undi, Lantikan Terus dan *Requisition* sistem mekanikal mestilah merujuk **Jadual Kadar Kerja Mekanikal 2021**. Surat Arahan ini terpakai bagi semua perolehan kerajaan yang dilaksanakan secara Kerja Undi, Lantikan Terus dan *Requisition* sistem mekanikal yang dikendalikan oleh JKR Malaysia selaras dengan Pekeliling Perbendaharaan, Perolehan Kerajaan dan arahan-arahan lain yang sedang berkuat kuasa.

Rujukan: JKR.KPKR:121.010/05 Jld. 23 (4)

Tarikh : 6 April 2021

3.2 Sebarang pertanyaan berhubung dengan **Jadual Kadar Kerja Mekanikal 2021** ini boleh diajukan secara bertulis kepada Pengarah Kanan, Cawangan Kejuruteraan Mekanikal Ibu Pejabat JKR Malaysia.

4.0 KUAT KUASA

Surat Arahan ini berkuat kuasa serta merta dan terpakai bagi tempoh **TIGA (3) TAHUN** iaitu **hingga 31 Mac 2024** melainkan jika terdapat arahan dasar terkini atau perkembangan baharu yang memerlukan dikaji semula dan dikemas kini lebih awal atau sebelum tempoh tersebut berakhir.

Sekian, terima kasih.

“PRIHATIN RAKYAT : DARURAT MEMERANGI COVID-19”

“BERKHIDMAT UNTUK NEGARA”

(DATO' Ir. HAJI MOHAMAD ZULKEFLY BIN SULAIMAN)

Rujukan: JKR.KPKR:121.010/05 Jld. 23 (4)

Tarikh : 6 April 2021

s.k

- Timbalan Ketua Pengarah Kerja Raya (Sektor Pakar)
- Timbalan Ketua Pengarah Kerja Raya (Sektor Infra)
- Timbalan Ketua Pengarah Kerja Raya (Sektor Bangunan)
- Pengarah Cawangan Dasar & Pengurusan Korporat

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1.0 **OBJEKTIF**

- 1.1 Menyediakan garis panduan kadar kerja bagi kerja pemasangan baharu dan pembaikan peralatan/sistem mekanikal dalam bangunan selaras dengan keperluan dan spesifikasi semasa.
- 1.2 Menjadikannya sebagai dokumen rujukan dalam menyediakan anggaran harga untuk kerja-kerja undi, lantikan terus dan *requisition* sistem mekanikal.

2.0 **PANDUAN PENGGUNAAN**

- 2.1 Kadar-kadar harga di dalam Jadual Kadar Kerja Mekanikal untuk Penyelenggaraan Mekanikal dan Kerja-Kerja Kecil Mekanikal ini hendaklah digunakan untuk perkiraan kos bagi kerja-kerja mekanikal yang dijalankan secara undi, lantikan terus dan *requisition*. Ia tidak sekali-kali boleh digunakan untuk mengira harga bagi kerja-kerja pindaan di dalam mana-mana Sebutharga atau Kontrak yang berdasarkan Senarai Kuantiti atau Pelan dan Spesifikasi.
- 2.2 Kadar-kadar harga ini adalah digunakan untuk kerja-kerja mekanikal di kawasan Wilayah Persekutuan Kuala Lumpur dan adalah tertakluk kepada faktor lokaliti di Para 3, sekiranya kerja-kerja dijalankan di kawasan lain.
- 2.3 Harga telah mengambil kira 20%-30% harga peralatan yang berkualiti, upah, pengangkutan, keuntungan, tempoh jaminan, pengujian dan pentauliahkan serta senggaraan dalam tempoh kecacatan.
- 2.4 Jika terdapat butir-butir kerja yang kadarnya tidak terdapat di dalam Jadual Kadar Kerja ini, harga persetujuan bolehlah digunakan dengan syarat jumlah nilai kerja berasaskan harga persetujuan ini tidak melebihi 30% daripada harga asal '*Requisition*' (harga asal ini tidak termasuk harga yang berasaskan harga persetujuan). Jika harga persetujuan ini melebihi 30% daripada harga asal '*Requisition*', kerja ini hendaklah dipanggil secara sebutharga.
- 2.5 Penggunaan Jadual Kadar Kerja ini hendaklah mematuhi Surat Pekeliling Perbendaharaan semasa.
- 2.6 Pengurusan kerja-kerja mekanikal melalui undi, lantikan terus dan *requisition* hendaklah dilaksanakan dengan menggunakan borang-borang perolehan yang telah ditetapkan.
- 2.7 Sekiranya terdapat sebarang masalah mengenai penggunaan Jadual Kadar Kerja ini, ianya hendaklah dirujuk kepada Pengarah Kanan Cawangan Kejuruteraan Mekanikal, Ibu Pejabat JKR Malaysia, Kuala Lumpur.

3.0 **FAKTOR LOKALITI**

Faktor lokaliti adalah satu Faktor Pendarab (*Multiplying Factor*) yang digunakan untuk pelarasan anggaran kadar harga bagi mengambilkira perbezaan lokaliti di mana kerja-kerja dilaksanakan.

Berikut adalah jadual faktor lokaliti kategori kawasan yang telah ditetapkan:

BIL	NEGERI	FAKTOR PNDARAB
i.	Selangor	1.0
	Wilayah Persekutuan Kuala Lumpur	
	Wilayah Persekutuan Putrajaya	
	Negeri Sembilan	
	Melaka	
	Johor	
ii.	Perlis	1.1
	Kedah	
	Pulau Pinang	
iii.	Perak	1.15
	Pahang	
	Terengganu	
	Kelantan	
iv.	Sabah	1.3
	Sarawak	
	Wilayah Persekutuan Labuan	

Nota:

Faktor -faktor tersebut adalah diperolehi melalui kaedah-kaedah statistik dengan menggunakan Wilayah Persekutuan Kuala Lumpur sebagai lokaliti asas. Pengemaskinian faktor tersebut akan dibuat dari masa ke semasa.

(4)

KADAR KERJA SISTEM PENYAMAN UDARA

(4.1)

KADAR KERJA BAGI PEMASANGAN SISTEM LENGKAP

4.1.1 AIR COOLED SPLIT UNIT SYSTEM

Nota: 1. Kadar kerja pemasangan paip gas penyejuk sehingga 6 meter sahaja.
"Tambahan paip gas penyejuk, pendawaian dan *drain pipe* rujuk anggaran kadar kerja peralatan/bahan"

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
<u>Wall Mounted System</u>			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 / PVC 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	
<u>Ceiling Mounted/Suspended</u>						
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 / PVC 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			

No.	Description	Type	Capacity (Btu/hr)	Quantity	Unit	Price (RM)
<u>Cassette 4 Way Blow</u>						
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 / PVC 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			
<u>Floor Standing</u>						
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 / PVC 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

Pendawaian Sistem Penyaman Udara

Pendawaian hendaklah menggunakan spesifikasi seperti di bawah:

No.	Cooling Capacity	Cable Size & Type	Interconnection Cable Size & Type
1	9,000 Btu/hr to 29,000 Btu/hr (1.0hp – 2.5hp, single phase)	4.0mm ² , PVC/PVC	2.5mm ² , 3 core
2	30,000 Btu/hr to – 50,000 Btu/hr (3.0hp – 5.0hp, 3 phase)	6.0mm ² , PVC/PVC	4.0mm ² , 4 core

(4.2)

KADAR KERJA BAGI PEMASANGAN PERALATAN/BAHAN

4.2.1 AIR COOLED SPLIT UNIT SYSTEM

4.2.1.1 Indoor Units

No.	Description	Capacity BTU/h	Quantity	Unit	Price (RM)
<u>Wall Mounted System</u>					
1	Indoor unit c/w remote controller	9,000	1	set	550.00
		10,000	1	set	600.00
		13,000	1	set	650.00
		15,000	1	set	680.00
		18,000	1	set	800.00
		20,000	1	set	900.00
		24,000	1	set	1,000.00
		27,000	1	set	1,150.00
		30,000	1	set	1,250.00
<u>Ceiling Mounted/Suspended</u>					
2	Indoor unit c/w remote controller	9,000	1	set	850.00
		10,000	1	set	1,000.00
		13,000	1	set	1,200.00
		15,000	1	set	1,400.00
		18,000	1	set	1,480.00
		20,000	1	set	1,450.00
		24,000	1	set	1,500.00
		27,000	1	set	1,850.00
		30,000	1	set	2,300.00
		35,000	1	set	2,400.00
		40,000	1	set	2,800.00
		50,000	1	set	3,000.00
60,000	1	set	3,400.00		
<u>Cassette 4 Way Blow</u>					
3	Indoor unit c/w remote controller	9,000	1	set	1,200.00
		10,000	1	set	1,300.00
		13,000	1	set	1,400.00
		15,000	1	set	1,500.00
		18,000	1	set	1,800.00
		20,000	1	set	2,000.00
		24,000	1	set	2,100.00
		27,000	1	set	2,300.00
		30,000	1	set	2,350.00
		35,000	1	set	2,400.00
		40,000	1	set	2,600.00
		50,000	1	set	2,800.00

No.	Description	Capacity BTU/hr	Quantity	Unit	Price (RM)
<u>Floor Standing</u>					
4	Indoor unit c/w remote controller	30,000	1	set	2,600.00
		40,000	1	set	2,800.00
		50,000	1	set	3,100.00
		60,000	1	set	3,500.00
		80,000	1	set	6,500.00
		100,000	1	set	9,000.00
		125,000	1	set	9,500.00
		150,000	1	set	12,000.00

4.2.1.2 Outdoor Units

No.	Description	Capacity BTU/hr	Quantity	Unit	Price (RM)
<u>Outdoor Unit</u>					
4	All out door unit to be match with the indoor unit accordingly.	9,000	1	set	950.00
		10,000	1	set	1,000.00
		13,000	1	set	1,200.00
		15,000	1	set	1,250.00
		18,000	1	set	1,800.00
		20,000	1	set	2,000.00
		24,000	1	set	2,200.00
		27,000	1	set	2,400.00
		30,000	1	set	2,850.00
		40,000	1	set	4,200.00
		50,000	1	set	4,500.00
		60,000	1	set	5,800.00
		80,000	1	set	9,000.00
		100,000	1	set	10,000.00
		125,000	1	set	11,500.00
		150,000	1	set	15,000.00

4.2.2 AIR CONDITIONING ITEMS & PARTS

- Nota:
1. Kadar harga termasuk alatganti dan pemasangan yang sempurna.
 2. Setiap pemasangan hendaklah disenggara dan diberi jaminan selama enam (6) bulan.
- * Panduan Penggunaan Perkara 2.3 adalah berkaitan.

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
A. Indoor						
1	PC Board / Circuit Board		1 Hp	1	unit	380.00
			1.5 Hp	1	unit	380.00
			2 Hp	1	unit	400.00
			2.5 Hp	1	unit	400.00
			3 Hp	1	unit	420.00
			3.5 Hp	1	unit	470.00
			4 Hp	1	unit	490.00
2	Coil Sensor / Room Temperature Sensor		1 Hp	1	unit	125.00
			1.5 Hp	1	unit	125.00
			2 Hp	1	unit	125.00
			2.5 Hp	1	unit	130.00
			3 Hp	1	unit	130.00
			3.5 Hp	1	unit	150.00
			4 Hp	1	unit	150.00
3	Cooling Coil / Evaporator	Aluminium 12 fin / inch	1 Hp	1	unit	820.00
			1.5 Hp	1	unit	830.00
			2 Hp	1	unit	890.00
			2.5 Hp	1	unit	890.00
			3 Hp	1	unit	900.00
			3.5 Hp	1	unit	1050.00
			4 Hp	1	unit	1050.00
4	Evaporator Casing		1 Hp	1	unit	300.00
			1.5 Hp	1	unit	300.00
			2 Hp	1	unit	320.00
			2.5 Hp	1	unit	330.00
			3 Hp	1	unit	330.00
			3.5 Hp	1	unit	360.00
			4 Hp	1	unit	366.00
5	Fan Capacitor		1.0 uF	1	unit	10.00
			2.0 uF	1	unit	10.00
			3.0 uF	1	unit	10.00
			4.0 uF	1	unit	10.00
			5.0 uF	1	unit	11.00
			6.0 uF	1	unit	12.00
6	Air Filters	Plastic Washable		1	unit	75.00

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
7	Drain Pump c/w hose	Cassette Type		1	unit	520.00
B. <u>Outdoor</u>						
1	Condenser fan motor c/w fan blade		1 Hp	1	unit	440.00
			1.5 Hp	1	unit	460.00
			2 Hp	1	unit	480.00
			2.5 Hp	1	unit	480.00
			3 Hp	1	unit	500.00
			3.5 Hp	1	unit	550.00
			4 Hp	1	unit	650.00
			5 Hp	1	unit	1100.00
2	Condenser coil	Aluminium 12 fin / inch	1 Hp	1	unit	890.00
			1.5 Hp	1	unit	900.00
			2 Hp	1	unit	950.00
			2.5 Hp	1	unit	1000.00
			3 Hp	1	unit	1050.00
			3.5 Hp	1	unit	1,500.00
			4 Hp	1	unit	1,700.00
			5 Hp	1	unit	1,850.00
3	Compressor c/w rubber mounting and terminal cable.		1 Hp	1	unit	1050.00
			1.5 Hp	1	unit	1050.00
			2 Hp	1	unit	1,200.00
			2.5 Hp	1	unit	1,200.00
			3 Hp	1	unit	1,400.00
			3.5 Hp	1	unit	1,600.00
			4 Hp	1	unit	1,750.00
			5 Hp	1	unit	1,950.00
4	Capillary tube / TXV / Expansion valve		1 Hp	1	unit	350.00
			1.5 Hp	1	unit	360.00
			2 Hp	1	unit	380.00
			2.5 Hp	1	unit	390.00
			3 Hp	1	unit	450.00
			3.5 Hp	1	unit	500.00
			4 Hp	1	unit	540.00
			5 Hp	1	unit	550.00
5	Start capacitor		30 uF	1	unit	40.00
			40 uF	1	unit	43.00
			45 uF	1	unit	44.00
			50 uF	1	unit	46.00
			60 uF	1	unit	48.00
6	Filter Drier & Sight Glass		3.5 Hp	1	unit	500.00
			4 Hp	1	unit	540.00
			5 Hp	1	unit	550.00
7	Overload	Single Phase	Up to 20 Amp	1	unit	150.00
		Three Phase	0- 20 Amp	1	unit	180.00
			20 – 30 Amp	1	unit	210.00

8	Contactor	Single Phase	Up to 20 Amp	1	unit	240.00
		Three Phase	0- 20 Amp	1	unit	300.00
			20 – 30 Amp	1	unit	350.00
9	Refrigerant pipe c/w Insulation	Rujuk Jadual Kadar Harga Peralatan/Bahan				
C. <u>Other Parts</u>						
1	Refrigerant Gas Refill		R22	1	kg	30.00
			R410a	1	kg	150.00
			R32	1	kg	100.00
2	Filter					
2.1	Plastic air filter c/w frame & media filter	Washable	Standard	1	set	25.00
			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	
3	Filter drier		<u>Inch</u>			
			1/4	1	unit	60.00
			3/8	1	unit	60.00
			1/2	1	unit	85.00
			5/8	1	unit	105.00
			7/8	1	unit	135.00
	1	1	unit	150.00		
4	Sight glass		<u>Inch</u>			
			1/4	1	unit	35.00
			3/8	1	unit	45.00
			1/2	1	unit	60.00
			5/8	1	unit	75.00
			7/8	1	unit	90.00
	1	1	unit	120.00		
5	<u>External Drain Pump for Air Cooled Split (Wall Mounted, Ceiling Exposed)</u> Drain pump c/w motor, drain pipe, tank wiring and other accessories		<u>Head (m)</u>			
			2	1	set	400.00
			2.5	1	set	450.00
			3	1	set	500.00
		5	1	set	600.00	

4.2.3 PIPES AND FITTINGS

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
Pipes						
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			

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
5	Pipe PVC Class 'C' c/w fittings	Bare pipe	<u>Dia.(inch)</u>			
			1/2	1	m	15.00
			3/4	1	m	18.00
			1	1	m	35.00
			1 1/4	1	m	37.00
			1 1/2	1	m	38.00
			2	1	m	60.00
			2 1/2	1	m	63.00
6	Pipes PVC Class 'C' c/w fittings & trunking	25 mm Rubber compound insulation	<u>Dia.(inch)</u>			
			1/2	1	m	25.00
			3/4	1	m	28.00
			1	1	m	45.00
			1 1/4	1	m	47.00
			1 1/2	1	m	48.00
			2	1	m	70.00
			2 1/2	1	m	73.00
7	Pipes PVC Class 'C' c/w fittings & trunking	50 mm Rubber compound insulation	<u>Dia.(inch)</u>			
			1/2	1	m	35.00
			3/4	1	m	38.00
			1	1	m	55.00
			1 1/4	1	m	57.00
			1 1/2	1	m	58.00
			2	1	m	80.00
			2 1/2	1	m	83.00
Polyvinyl Chloride (PVC) Pipe Fittings						
8	PVC 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
9	PVC Bend	Polyvinyl chloride (PVC)	1/2	1	unit	4.40
			3/4	1	unit	5.25
			1	1	unit	6.75
			1 1/4	1	unit	9.50

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
			1 1/2	1	unit	13.10
			2	1	Unit	17.10
10	PVC Elbow	Polyvinyl chloride (PVC)	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
11	PVC Reducer Tee	Polyvinyl chloride (PVC)	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
12	PVC Equal Tee	Polyvinyl chloride (PVC)	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
13	PVC Reducing Socket	Polyvinyl chloride (PVC)	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
14	PVC End Cap	Polyvinyl chloride (PVC)	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
15	PVC Connector	Polyvinyl chloride (PVC)	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

4.2.4 ELECTRICAL WORKS

No.	Description	Type	Capacity	Quantity	Unit	Price (RM)
1	Starter / Heater Switch			1	unit	18.00
2	DOL Starter			1	unit	55.00
3	Transformer		3.7 KW	1	unit	380.00
			7.5 KW	1	unit	630.00
4	Timer		60 Sec	1	unit	35.00
			60 Minute	1	unit	50.00
			24 Hour	1	unit	60.00
5	Push button	NO / NC		1	unit	30.00
6	LED Indicator light	Red, Yellow or Blue		1	unit	30.00
7	Selector switch	Auto / Manual		1	unit	60.00
8	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
9	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
10	G.I. Conduit		19 mm	1	m	52.00
			25 mm	1	m	60.00
11	G.I. Trunking		1" x 2"	1	m	45.00
			2" x 2"	1	m	60.00
			2" x 3"	1	m	70.00
12	PVC/SWA/PVC cable (armoured cable)		4C x 1½ mm ²	1	m	35.00
			3C x 2½ mm ²	1	m	45.00
			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
13	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
14	MCCB		16A 3P	1	unit	57.00
			20A 3P	1	unit	62.00
			30A 3P	1	unit	68.00
15	Control timer		240VAC	1	unit	78.00
			24VAC	1	unit	56.00
16	Control relays		240VAC	1	unit	95.00
			24VAC	1	unit	65.00
17	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
18	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

(4.3)

KADAR KERJA BAGI PENYENGGARAAN

4.3.1 KADAR KERJA BAGI PENYENGGARAAN

4.3.1.1 Penyenggaraan Bulanan

No.	Description	Price (RM) 1.0hp – 3.0hp	Price (RM) 3.5hp – 5.0hp
1	To service ACSU (Wall Mounted) as per *JKR specification for Indoor and Outdoor Unit	30.00	40.00
2	To service ACSU (Ceiling Suspended) as per *JKR specification for Indoor and Outdoor Unit	45.00	50.00
3	To service ACSU (Ceiling Cassette) as per *JKR specification for Indoor and Outdoor Unit	45.00	50.00
4	To service ACSU (Floor Standing) as per *JKR specification for Indoor and Outdoor Unit	30.00	40.00
<p>*Specification for monthly servicing;</p> <p>a. Indoor Unit:</p> <ul style="list-style-type: none"> i. Inspect unit for any abnormalities. Trace the faults and rectify as necessary; ii. Inspect and clean all air filters; iii. Inspect leakage or clogging at drain pan and drain line. Flush as necessary; and iv. Inspect refrigerant piping, joints, fittings and insulation for leaks or damages. <p>b. Outdoor Unit:</p> <ul style="list-style-type: none"> i. Inspect refrigerant leaks at joints, fittings, piping, piping and compressors; ii. Inspect all fans and motors as necessary; and iii. Inspect condensing coil, filter dryer, compressor units and paddings. <p>c. Write a service report as necessary.</p>			

4.3.1.2 Baikpulih Tanpa Ceraian

No.	Description	Price (RM) 1.0hp – 3.0hp	Price (RM) 3.5hp – 5.0hp
1	To perform chemical cleaning for ACSU (Wall Mounted) as per *JKR specification for Indoor and Outdoor Unit	240.00	300.00
2	To perform chemical cleaning for ACSU (Ceiling Suspended) as per *JKR specification for Indoor and Outdoor Unit	240.00	300.00
3	To perform chemical cleaning for ACSU (Ceiling Cassette) as per *JKR specification for Indoor and Outdoor Unit	320.00	400.00
4	To perform chemical cleaning for ACSU (Floor Standing) as per *JKR specification for Indoor and Outdoor Unit	240.00	300.00
<p>*Specification for chemical cleaning:</p> <p>a. Indoor Unit:</p> <ul style="list-style-type: none"> i. Inspect unit for any abnormalities; ii. Dismantle indoor casing; iii. Inspect and clean all air filters; iv. Inspect leakage or clogging at drain pan and drain line; v. Clean (with chemical) and as necessary; and vi. Flush drain pipe as necessary. 			

No.	Description	Price (RM) 1.0hp – 3.0hp	Price (RM) 3.5hp – 5.0hp
	<p>b. Outdoor Unit:</p> <ul style="list-style-type: none"> i. Dismantle casing as necessary; ii. Cover all electrical parts; and iii. Clean (with chemical) and fas necessary. <p>c. Test run as necessary with reports.:</p>		

4.3.1.3 Baikpulih Besar (*Overhaul*)

No.	Description	Price (RM) 1.0hp – 3.0hp	Price (RM) 3.5hp – 5.0hp
1	To overhaul ACSU (Wall Mounted) as per *JKR specification for Indoor and Outdoor Unit	350.00	450.00
2	To overhaul ACSU (Ceiling Suspended) as per *JKR specification for Indoor and Outdoor Unit	350.00	450.00
3	To overhaul ACSU (Ceiling Cassette) as per *JKR specification for Indoor and Outdoor Unit	400.00	500.00
4	To overhaul ACSU (Floor Standing) as per *JKR specification for Indoor and Outdoor Unit	350.00	450.00

*Specification for chemical cleaning.

a. Indoor Unit:

- i. Inspect unit for any abnormalities;
- ii. Pump down the system;
- iii. Dismantle indoor unit from the instalation;
- iii. Dismantle all components;
- iv. Clean (with chemical) and as necessary;
- vi. Re-assemble the unit and fix to the installation; and
- v. Flush drain pipe as necessary.

b. Outdoor Unit:

- i. Dismantle casing as necessary;
- ii. Cover all electrical parts;
- iii. Clean (with chemical) and as necessary;
- iv. . Clean (with chemical) and fas necessary;
- v. . Assemble back the installation;
- vi. . Assemble the refrigerant piping and check for any leaking and make good as necessary; and
- vii. . Top up refrigerant as necessary

c. Test run as necessary with reports.

(5)

KADAR KERJA SISTEM PENCEGAH KEBAKARAN

(5.1)

KADAR KERJA BAGI PEMASANGAN PERALATAN/BAHAN

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 and BOMBA certificate	1	set	280.00
	9.0 kg. dry powder portable fire extinguishers c/w mounting brackets, lockable cabinet and BOMBA certificate	1	set	600.00
2	5.0 kg. carbon dioxide fire extinguishers c/w mounting brackets and BOMBA certificate	1	set	300.00
	5.0 kg. carbon dioxide fire extinguishers c/w mounting brackets, lockable cabinet and BOMBA certificate	1	set	800.00
3	2.0 kg. carbon dioxide fire extinguishers c/w mounting brackets and BOMBA certificate	1	set	260.00
	2.0 kg. carbon dioxide fire extinguishers c/w mounting bracket, lockable cabinet and BOMBA certificate	1	set	500.00

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.			
	[3.0 - 4.0 HP]	1	set	6,600.00
	[5.0 - 6.0 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 - Underground 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 kerja peralatan/bahan
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	Hot-dipped galvanised pressed steel water tank (2,400 gallons) c/w I-beam, water level indicator (stainless steel wire rope), Stainless Steel 304 electrodes c/w holder and spacer, ball valve, cover, ladder, overflow pipe, scour pipe, etc.	1	set	17,000.00
8	Lightning surge protector	1	set	1,450.00
9	Alarm for hose reel system (outside pump room)	1	set	100.00

No.	Description	Quantity	Unit	Price (RM)
10	Balancing, calibration, testing and commissioning of all system equipment and components	1	set	1,500.00

Pendawaian Sistem Pam

No.	Motor HP	Cable Size & Type	Interconnection Cable Size & Type
1	1.0hp – 2.5 hp (single phase)	4.0mm ² PVC/PVC	4.0mm ² PVC/PVC
2	3.0hp – 5.0hp (3 phase)	6.0mm ² SWA	6.0mm ² PVC/PVC

5.1.3 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 kerja peralatan/bahan
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

5.1.4 PIPE AND FITTINGS

No.	Description	Specification	Quantity	Unit	Price (RM)
Pipes					
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	Schedule 40 seamless galvanised iron/steel	3	1	m	130.00
		4	1	m	158.00
		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		
Galvanized Iron (GI) Fittings					
4	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		
5	G.I. Tees	½	1	unit	15.00
		¾	1	unit	19.00
		1	1	unit	21.00
		1¼	1	unit	27.00

No.	Description	Specification	Quantity	Unit	Price (RM)
		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
6	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
7	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
8	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
9	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
10	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
11	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

No.	Description	Specification	Quantity	Unit	Price (RM)
12	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
13	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
14	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
15	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
16	Pressure gauge	4" Dial face	1	unit	238.00
		6" Dial face	1	unit	330.00
17	Automatic air release valve	1	1	unit	150.00
		2	1	unit	200.00
18	Pressure differential switch		1	unit	355.00
Valves					
19	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
20	Stop valves	1	1	unit	150.00
		2	1	unit	160.00
21	Landing valves		1	unit	540.00
22	Gate valve	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		

No.	Description	Specification	Quantity	Unit	Price (RM)
23	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

5.1.5 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	Hot-dipped galvanised pressed steel plates water tank per panel	5mm	1	unit	400.00
		6mm	1	unit	470.00
	Complete stainless steel non float electrodes c/w holder and wiring		1	set	2,000.00
6	Hose reel pump test port c/w pressure switch, pressure gauges and wiring		1	set	1,000.00
	Alarm / sounder outside pump room		1	unit	100.00
8	Canvas hose c/w jet and spray nozzle		1	unit	400.00
9	Swing type cradle		1	unit	250.00
10	Grease		1	per kg	105.00

5.1.6 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	50.00
		2.5mm ²	1	m	80.00
		4.0mm ²	1	m	125.00
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	35.00
		3C x 2½ mm ²	1	m	45.00
		4C x 2½ mm ²	1	m	60.00

No.	Description	Specification	Quantity	Unit	Price (RM)
		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)

KADAR KERJA BAGI PENYENGGARAAN

5.2.1 JADUAL KADAR KERJA PENYENGGARAAN SISTEM PENCEGAH KEBAKARAN

5.2.1.1 PORTABLE FIRE EXTINGUISHER

No	Description	KUANTITI	UNIT	HARGA (RM)
1	To Obtain Jabatan Bomba dan Penyelamat Malaysia (JBPM) certification upon expiry date as per *JKR specification for Portable Fire Extinguisher	1	set of Dry Powder (9kg)	45.00
		1	set of CO ₂ (5kg)	55.00
<p>* Specification for Portable Fire Extinguisher</p> <ul style="list-style-type: none">i. Inspect any missing, damaged or deteriorated parts on the cylinder, pressure gauge, hose connector, discharge valve, handle, cylinder safety pin, seal and cylinder holder. Repair or replace as necessary;ii. Inspect fire extinguisher cabinet. Repair or replace as necessary; andiii. Inspect the condition of the content. Refill or replace as necessary.				

5.2.1.2 HOSE REEL SYSTEM

a. Hose Reel

No	Description	KUANTITI	UNIT	HARGA (RM)
1	To service Hose Reel as per *JKR specification for Hose Reel	1	per unit of hose reel	10.00
<p>* Specification for Hose Reel</p> <ul style="list-style-type: none">i. Inspect that the hose reel is obstruction free;ii. Inspect any missing, damaged or deteriorated parts on the hose reel drum and hose reel;iii. Inspect the ease of operation and swing of each hose reel drum. Adjust as necessary;iv. Inspect for any leaks or drips at the drum goose neck and gate valve;v. Ensure that the diffuser nozzle can be operated freely and the hose is not twisted or curled; andvii. Test hose reel for leakage.				

b. Hose Reel Pump

No	Description	KUANTITI	UNIT	HARGA (RM)
1	To service Hose Reel Pump as per *JKR specification for Hose Reel Pump	1	per set of pumps	300.00
<p>* Specification for Hose Reel Pump (Montly)</p> <ol style="list-style-type: none"> i. Inspect condition of pumps. (Cleanliness/ appearance/ noise). Clean as necessary; ii. Test run each pump on automatic and manual mode and Inspect the correct cut-in or cut-out auto mode operation of the pressure switch. Check pressures; iii. Inspect all pump bearings for excessive noise, vibration and wear. Lubricate with oil or grease as necessary; iv. Inspect carbon brushes and slip rings of all motors. Clean as necessary; v. Inspect safety devices fitted to all motors; vi. Inspect all seals including mechanical seals for leakages; vii. Adjust pump glands as necessary; viii. Inspect each pump or motor alignment, mountings and correct rotation. Adjust as necessary; ix. Inspect all rubber couplings between pumps and drive motor; x. Inspect all belt drives, all bolts and nuts, Adjust, re-tension and tighten as necessary; xi. Inspect and test pressure switches and gauges; and xii. Check and refill diesel pump fuel. 				
No	Description	KUANTITI	UNIT	HARGA (RM)
2.	To overhaul Hose Reel Pump c/w pump motor rewinding, bearing and mechanical seal replacement, shaft alignment and mega test.			
	a. 1 – 3hp	1	set of pumps	1,300.00
	b. 4 – 7hp	1	set of pumps	3,500.00

c. Hose Reel Tank

No	Description	KUANTITI	UNIT	HARGA (RM)
1.	To service Hose Reel Tank as per *JKR specification for Hose Reel Tank.	1	per set of tanks	50.00
<p>* Specification for Hose Reel Tank (Montly)</p> <ol style="list-style-type: none"> i. Inspect and report for integrity of structure; ii. Rectify as necessary; iii. Inspect for leaks. Inspect for rust; iv. Inspect operation of ball valve; v. Inspect water tank level indicator, Inspect electrode and clean; vi. Inspect for sediment or sludge. Flush and clean; and vii. Inspect internal and external cat ladder. 				

(6)

SISTEM BEKALAN AIR SEJUK DALAMAN

(6.1)

KADAR KERJA BAGI PEMASANGAN PERALATAN/BAHAN

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.	2	nos	10,000.00
	1.5 Hp			15,000.00
	2.0 Hp			25,000.00
	3.0 HP			30,000.00
	5.5 Hp			
2	Control panel c/w conduits, cabling, control wiring between switchboard and various equipment (above and underground), automatic switches and controls, 30A 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	Earthing & 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	Rujuk Jadual Kadar Kerja Peralatan / Bahan

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.	2	nos	10,000.00
	0.75 Hp			12,000.00
	1.5 Hp			18,000.00
	3.0 HP			22,000.00
	5.0 Hp			
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	Earthing & 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	Rujuk Jadual Kadar Harga Peralatan / Bahan

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	20,000.00
	1.0 Hp			25,000.00
	2.0 Hp			27,500.00
	2.5 HP			35,000.00
	3.0 Hp			
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	Earthing & 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	Rujuk Jadual Kadar Harga Peralatan / Bahan

Pendawaian Sistem Pam

No.	Motor HP	Cable Size & Type	Interconnection Cable Size & Type
1	1.0hp – 2.5 hp (single phase)	4.0mm ² PVC/PVC	4.0mm ² PVC/PVC
2	3.0hp – 5.0hp (3 phase)	6.0mm ² SWA	6.0mm ² PVC/PVC

6.1.4 PIPE AND FITTINGS

No.	Description	Specification	Quantity	Unit	Price (RM)
Pipe					
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	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
3	Schedule 40 seamless galvanised iron/steel	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
Galvanized Iron (GI) Fittings					
4	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		

No.	Description	Specification	Quantity	Unit	Price (RM)
5	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
6	G.I. Cross tee	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
7	G.I. Reducing tee	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
8	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
9	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
10	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

No.	Description	Specification	Quantity	Unit	Price (RM)
11	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
12	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
13	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
14	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
15	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
16	Pressure gauge	4" Dial face	1	unit	238.00
		6" Dial face	1	unit	330.00
17	Automatic air release valve	1	1	unit	150.00
		2	1	unit	200.00
18	Pressure differential switch		1	unit	355.00
Valves					
19	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
20	Stop valves	4	1	unit	105.00
		1	1	unit	150.00
21	Landing valves	2	1	unit	160.00
			1	unit	540.00

No.	Description	Specification	Quantity	Unit	Price (RM)
22	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
23	Check valves	6	1	unit	430.00
		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
Acrylonitrile Butadiene Styrene (ABS) Pipe Fittings					
24	Tee	<u>Inch</u>			
		1/2	1	unit	20.00
		3/4	1	unit	22.00
		1	1	unit	37.00
		1 1/4	1	unit	50.00
		1 1/2	1	unit	57.00
25	Bend	1/2	1	unit	10.00
		3/4	1	unit	15.00
		1	1	unit	23.00
		1 1/4	1	unit	27.00
		1 1/2	1	unit	30.00
26	Elbow	2	1	unit	73.00
		1/2	1	unit	11.00
		3/4	1	unit	17.00
		1	1	unit	25.00
		1 1/4	1	unit	28.00
		1 1/2	1	unit	30.00
27	Reducer tee	2	1	unit	77.00
		1/2	1	unit	19.00
		3/4	1	unit	22.00
		1	1	unit	37.00
		1 1/4	1	unit	45.00
28	Equal tee	1 1/2	1	unit	57.00
		1/2	1	unit	12.00
		3/4	1	unit	19.00
		1	1	unit	26.00
		1 1/4	1	unit	30.00
		1 1/2	1	unit	35.00
		2	1	unit	55.00

No.	Description	Specification	Quantity	Unit	Price (RM)
29	Reducing socket	1/2	1	unit	10.00
		3/4	1	unit	15.00
		1	1	unit	23.00
		1 1/4	1	unit	27.00
		1 1/2	1	unit	33.00
		2	1	unit	165.00
30	End cap	1/2	1	unit	10.00
		3/4	1	unit	13.00
		1	1	unit	16.00
		1 1/4	1	unit	22.00
		1 1/2	1	unit	28.00
		2	1	unit	37.00
31	Connector	1/2	1	unit	12.00
		3/4	1	unit	15.00
		1	1	unit	20.00
		1 1/4	1	unit	24.00
		1 1/2	1	unit	26.00
		2	1	unit	37.00

6.1.5 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	35.00
		3C x 2½ mm ²	1	m	45.00
		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

No.	Description	Specification	Quantity	Unit	Price (RM)
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

(6.2)

KADAR KERJA BAGI PENYENGGARAAN

6.2.1 JADUAL KADAR KERJA PENYENGGARAAN SISTEM PAM PENGALAK

No	Description	KUANTITI	UNIT	HARGA (RM)
A. <u>SISTEM PAM PENGALAK</u>				
1	<p>Inspection and Servicing of Booster Pump:</p> <ul style="list-style-type: none"> a. Inspect condition of pumps (cleanliness/ appearance/ noise). Clean as necessary. b. Test run each pump on automatic and manual mode. c. Inspect the correct cut-in or cut-out auto mode operation of the pressure switch. Check pressures. d. Inspect all motor bearings, lubricate with grease as necessary. e. Inspect all pump bearings for excessive noise, vibration and wear. Lubricate with oil or grease as necessary. f. Inspect carbon brushes and slip rings of all motors. Clean as necessary. g. Inspect safety devices fitted to all motors. h. Clean, adjust and lubricate. i. Inspect all seals including mechanical seals for leakages. j. Adjust pump glands as necessary. k. Inspect each pump or motor alignment, mountings and correct rotation. Adjust as necessary. l. Inspect all rubber couplings between pumps and drive motor. m. Inspect all belt drives. Adjust and re-tension as necessary. n. Inspect and tighten all bolts and nuts. o. Inspect and test pressure switches and gauges. p. Check and refill diesel pump fuel. 	1	per set of pumps	300.00
B. <u>Pump Refurbishment works:</u> Inclusive of pump motor rewinding, bearing and mechanical seal replacement, shaft alignment and mega test for:				
1	1 – 3hp	1	set of pumps	1,300.00
2	4 – 7hp	1	set of pumps	3,500.00

(7)

RUJUKAN

SENARAI RUJUKAN

- 12.1 Panduan Maklumat Kos Binaan JKR 2019 – Penyediaan Anggaran Kos Awalan
- 12.2 Jadual Kadar Kerja Elektrik 2018
- 12.3 Garis Panduan Anggaran Harga Sistem Mekanikal Dalam Bangunan Tahun 2018
- 12.4 Harga Pembekal
- 12.5 Input Teknikal daripada Bengkel Jawatankuasa
- 12.6 Input Teknikal Dari JKR Mekanikal Negeri.
- 12.7 Rekod-Rekod Perolehan 2015-2019 (Mekanikal)

(8)

PENGHARGAAN

PENAUNG

Dato' Ir. Hj. Habbali bin Ibrahim

PENASIHAT

Ir. Mamat Rohizan bin Abdullah

Ir. Zulkifli bin Abdul Rashad

PENYELARAS

Ir. Amirrudin bin Mohamed

AHLI JAWATANKUASA

Ir. Norhisham bin Launah

Ir. Zailani bin Nagin

Ir. Zalina binti Mohd Yusuf

Ir. Ahmad Ridzaudbin bin Ibrahim

Ir. Mohamad Tarmuzi bin Mat Nor

Ir. Che Hasim bin Awang

Amirudin bin Mohamad Ali

Zammeri Bin Sahar

Samsiah binti Omar

Norizaludin Bin Abd Karim

Azrul Nizam bin Adenan

Normah binti Ismail

Nor Hayati binti Yahya

Ir. Rosmawati binti Zahari

Ir. Fadzli bin Mohammad Ngimriti

Sr. Mohamad Razif bin Mohamad Nor

Mohd Badrulhisyam Bin Mohamad Noor

Azizul Rahim Bin Mohamad Zulkifli

Ameyrullah Bin Arshad

Osman bin Abdul Wahid

Ahmad Deli bin Mohd Nor

Afiq Bin Mohd Johari

Norul Hisam bin Lockman

Zulkipli bin Zakaria

