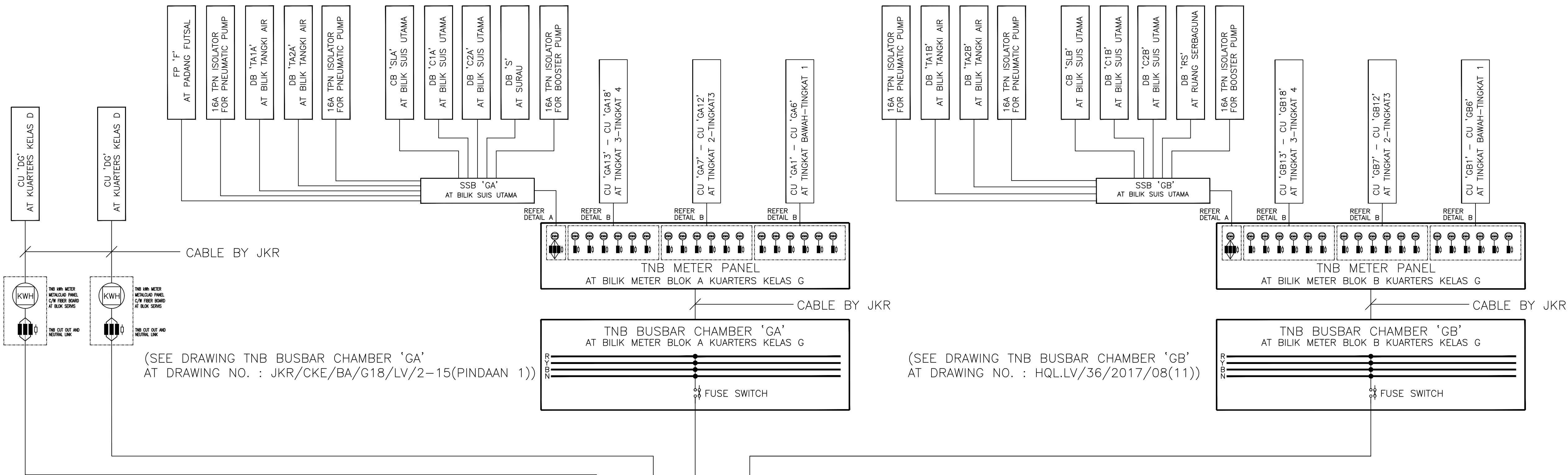
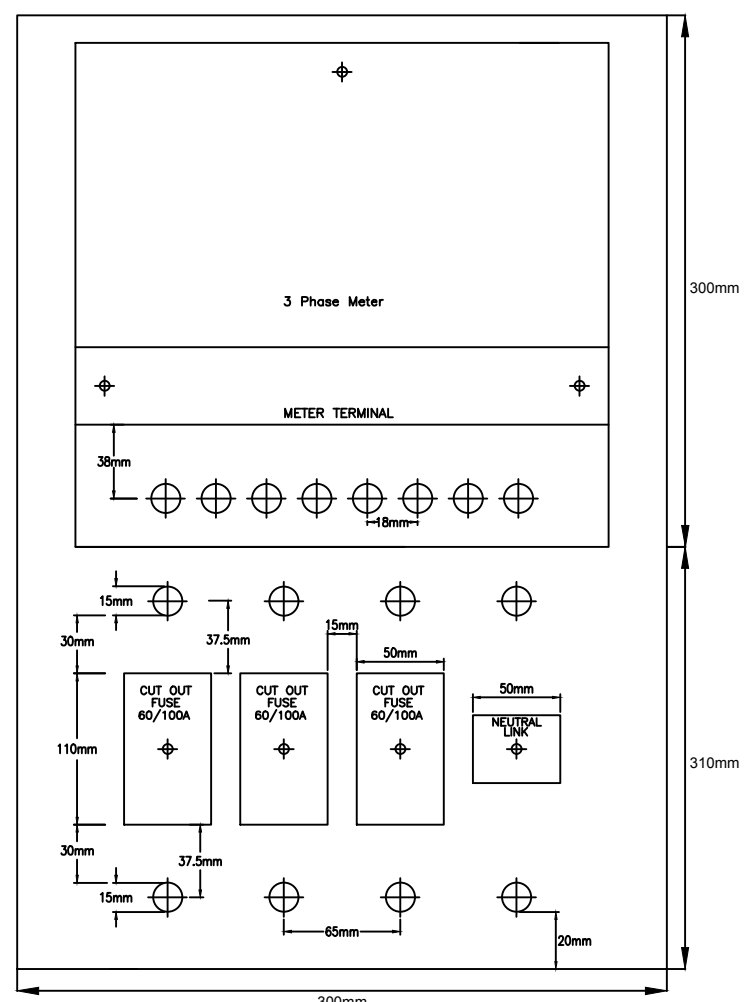




(SEE DRAWING TNB BUSBAR CHAMBER 'GA'
AT DRAWING NO. : JKR/CKE/BA/G18/LV/2-15(PINDAAN 1))

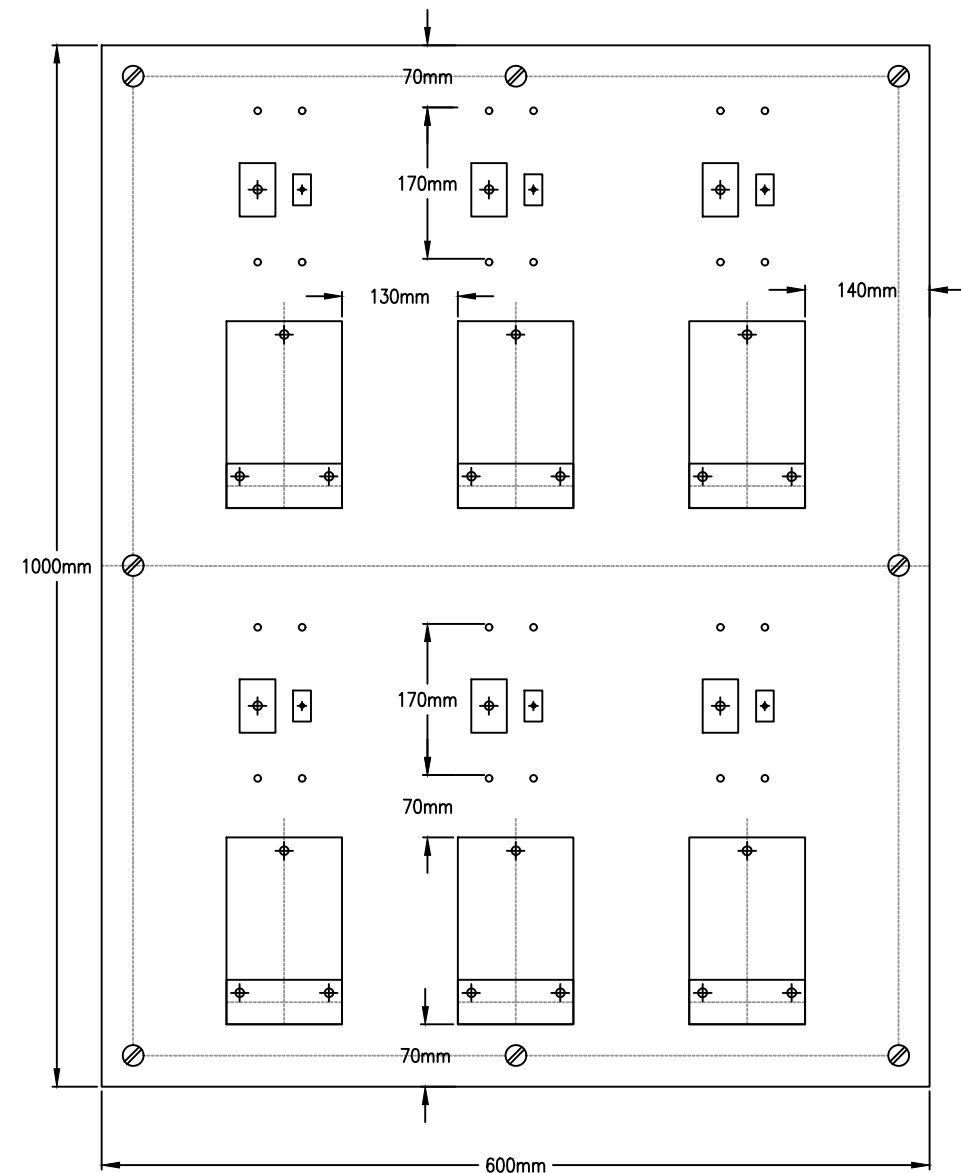
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AT DRAWING NO. : HQL.LV/36/2017/08(11))

DETAIL A



THREE PHASE METERING PANEL
(COMMON AREA) BILIK METER KUARTERS KELAS G

DETAIL B

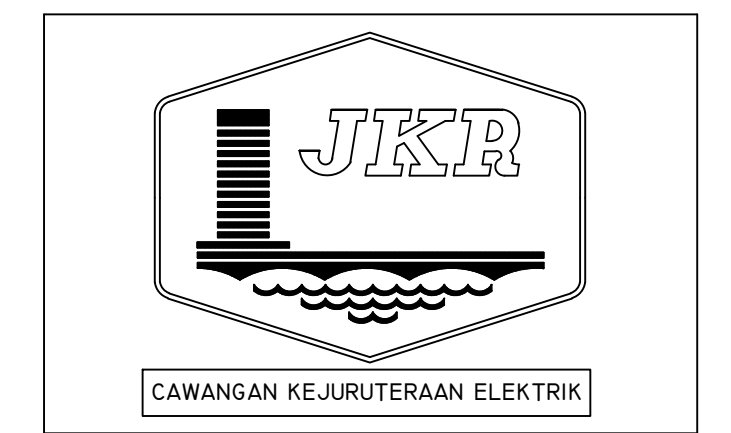


SINGLE PHASE GROUP METERING PANEL
BILIK METER KUARTERS KELAS G (TIPIKAL)

CATATAN

DISAHKAN

PENGARAH KANAN
Ir. HJ. YAKOB BIN ABDUL LATIF
PENGARAH PERUNDING REKABENTUK
Ir. SHAMSURIEE BIN SULAIMAN
JURUTERA ELEKTRIK PENGUASA KANAN
Ir. SITI NOR BINTI HASSAN
JURUTERA ELEKTRIK KANAN
Ir. HAMZAH BIN ISMAIL
JURUTERA ELEKTRIK
Ir. FARAH HANUM BINTI OMAR



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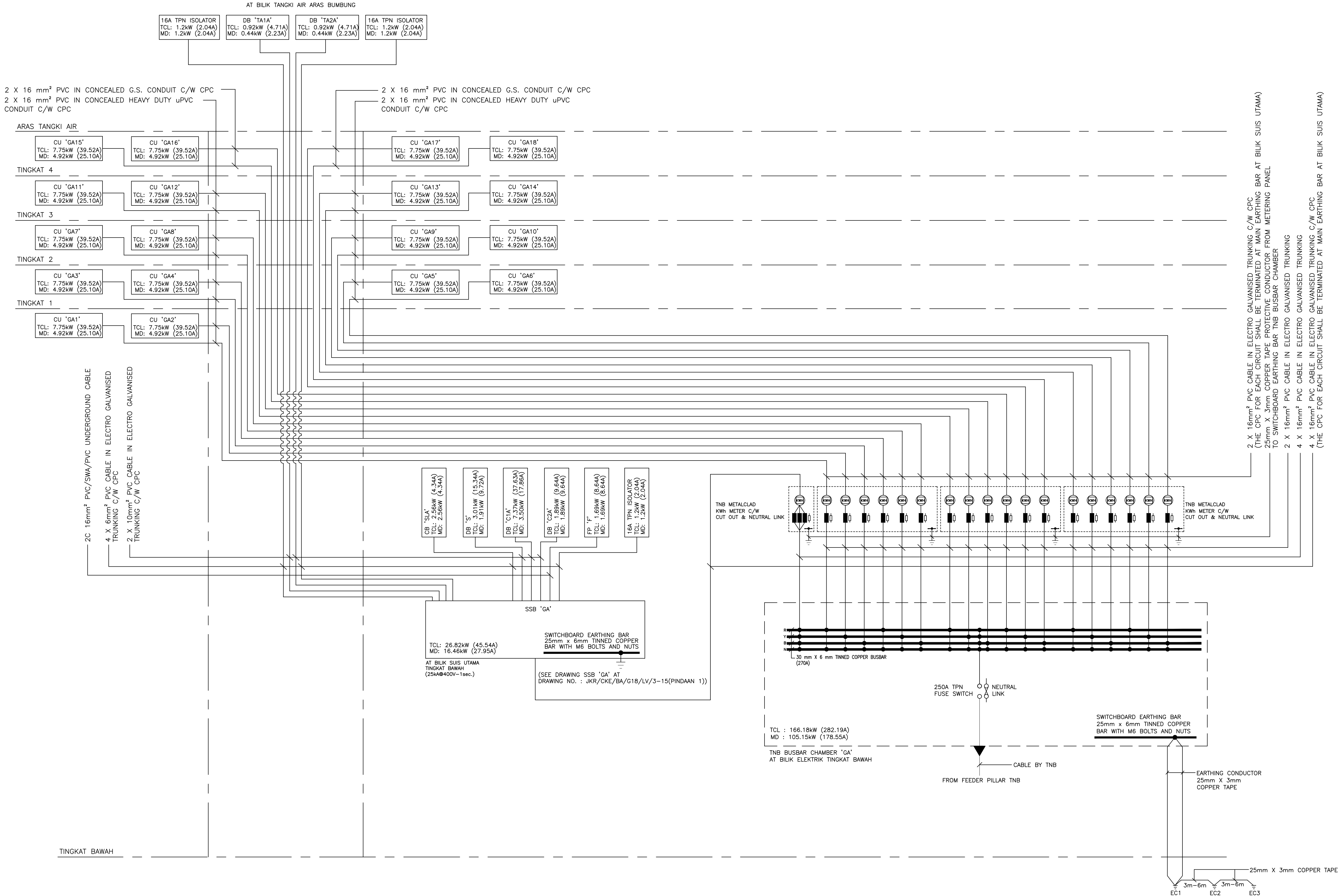
PROJEK
PEMASANGAN ELEKTRIK UNTUK PEMBINAAN
2 BLOK KUARTERS KELAS G PANGSA 5 TINGKAT
18 UNIT DAN 2 UNIT KUARTERS BERKEMBAR
KELAS D DI KUALA TAHAN, JERANTUT,
PAHANG DARUL MAKMUR (TENDER SEMULA).

TEMPAT
-

BUTIR-BUTIR
BLOCK DIAGRAM, SINGLE PHASE GROUP
METERING PANEL DAN THREE PHASE
METERING PANEL

UKURAN	N.T.S
DISURIH DARI	
DILUKIS OLEH	MOHD AMREE BIN ZAHARUDDIN
DISEMAK OLEH	Ir. FARAH HANUM BINTI OMAR
TARIKH	FEBRUARI 2020
BILANGAN FAIL	PKR(L) 36/2017

BILANGAN LUKISAN	PINDAAN
HQL.LV/36/2017/07(11)	

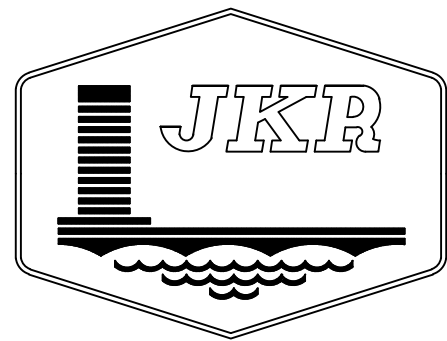


NOTE :
EC1/EC2/EC3
1. 16mm dia. x 3000mm (L) copper jacketed (minimum radial thickness 0.25mm) steel core earth electrode c/w 300mm (W) x 300mm (L) x 180mm (H) precast heavy duty concrete earth chamber & removable concrete cover etc.
2. The connection of the copper tape to the earth electrode shall be by exothermic welded connections.

CATATAN

DISAHKAN

PENGARAH KANAN
Ir. HJ. YAKOUB BIN ABDUL LATIF
PENGARAH PERUNDING REKABENTUK
Ir. SHAMSURIEE BIN SULAIMAN
JURUTERA ELEKTRIK PENGUASA KANAN
Ir. SITI NOR BINTI HASSAN
JURUTERA ELEKTRIK KANAN
Ir. HAMZAH BIN ISMAIL
JURUTERA ELEKTRIK
Ir. FARAH HANUM BINTI OMAR



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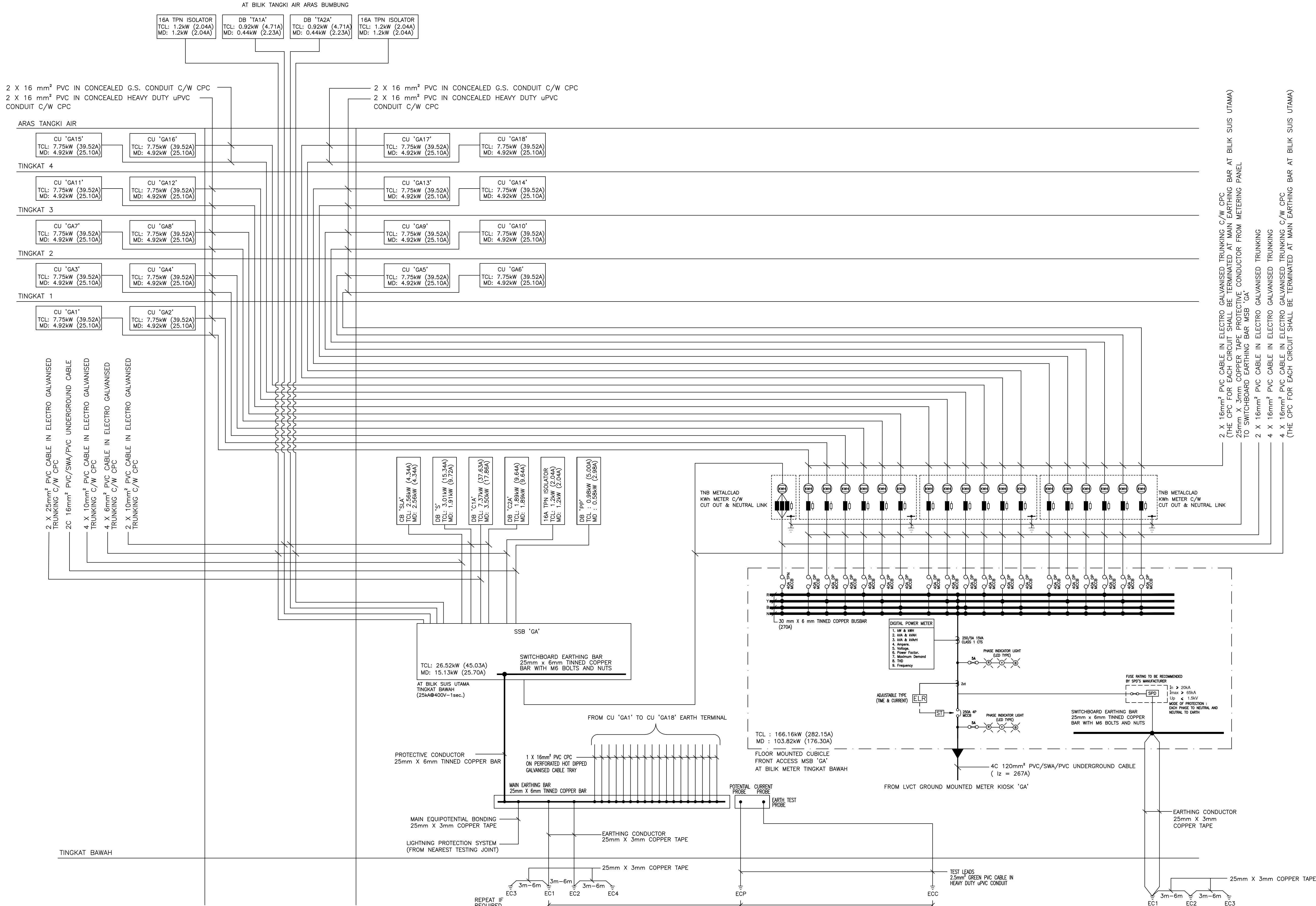
PROJEK
PRE - APPROVED PLAN (PAP) KUARTERS KELAS G
- PANGSA 5 TINGKAT (18 UNIT)

TEMPAT
BILIK SUIS UTAMA (BLOK A)

BUTIR-BUTIR
GAMBARAJAH PENDAWAIAN SKEMATIK
TNB BUSBAR CHAMBER 'GA'

UKURAN	N.T.S
DISURIH DARI	
DILUKIS OLEH	MOHD AMREE BIN ZAHARUDDIN
DISEMAK OLEH	Ir. FARAH HANUM BINTI OMAR
TARIKH	FEBRUARI 2020
BILANGAN FAIL	PKR(L) 36/2017

BILANGAN LUKISAN	PINDAAN
JKR/CKE/BA/G18/LV/2-15	1



NOTE:
EC1/EC2/EC3/EC4
1. 16mm dia. X 3000mm (L) copper jacketed (minimum radial thickness 0.25mm) steel core earth electrode c/w 300mm (W) X 300mm (L) X 180mm (H) precast heavy duty concrete earth chamber & cover etc.
2. Connection of the copper tape the earth electrode shall be by exothermic welded connections.

ECG/ECF
1. 16mm dia. X 1500mm (L) copper jacketed (minimum radial thickness 0.25mm) steel core earth electrode c/w 300mm (W) X 300mm (L) X 180mm (H) precast heavy duty concrete earth chamber & removable concrete cover etc.
2. The connection of the 2.5mm² green pvc cable to the earth electrode shall be by clamp.

NOTE:
EC1/EC2/EC3
1. 16mm dia. x 3000mm (L) copper jacketed (minimum radial thickness 0.25mm) steel core earth electrode c/w 300mm (W) x 300mm (L) x 180mm (H) precast heavy duty concrete earth chamber & removable concrete cover etc.
2. The connection of the copper tape to the earth electrode shall be by exothermic welded connections.

CATATAN

SWITCHBOARD (SSB & MSB)

A. Icu & Ics FOR INCOMING ACB / MCCB
Icu = 50kA @ 400V
Ics = 100% of Icu

B. Icu & Ics FOR OUTGOING ACB / MCCB
Icu = 50kA @ 400V
Ics = 50% of Icu

C. SWITCHBOARD CONSTRUCTION :-

i) FLOOR MOUNTED FRONT AND REAR ACCESS	a. FORM of SEPARATION : FORM 2B b. THICKNESS of FRAME : 2.5mm c. THICKNESS of PANEL : 2.0mm d. INDEX of PROTECTION : IP 41
ii) CUBICLE FRONT ACCESS	a. FORM of SEPARATION : FORM 2B b. THICKNESS of FRAME : 2.5mm c. THICKNESS of PANEL : 2.0mm d. INDEX of PROTECTION : IP 41
iii) WALL MOUNTED (Minimum)	a. THICKNESS of PANEL : 2.0mm b. INDEX of PROTECTION : IP 41 c. MOUNTING HEIGHT : 900mm FROM FINISHED FLOOR LEVEL

D. OTHERS

i) SWITCHBOARD LABELLING SHALL BE OF MINIMUM 10mm IN HEIGHT AND INCLUDE :-
a. SWITCHBOARD MANUFACTURER
b. NAME AND LOCATION OF THE OUT-GOINGS AND INCOMING SUPPLY

ii) ALL INDICATOR LIGHT SHALL BE OF LED TYPE

iii) ALL SWITCHBOARD SHALL BE FABRICATED TO SUIT THE ROOM SIZE

iv) IF THE INCOMING FEEDER CIRCUIT BREAKER IS RATED 400A AND ABOVE ALL MCCBS SHALL BE PROVIDED WITH ROTARY HANDLE WITH PADLOCKING FACILITIES

E. EARTHING

i) CONNECTION OF THE EARTHING CONDUCTORS TO THE EARTH ELECTRODES SHALL BE BY EXOTHERMIC WELDED CONNECTIONS

ii) EARTH ELECTRODES SHALL HAVE PURE COPPER UNIFORMLY MOLECULARLY BONDED ONTO A HIGH TENSILE STEEL CORE TO A MINIMUM OF THICKNESS OF 0.25mm

F. TABLE 4 - DIMENSIONS OF THE MAIN EARTHING BARS AND EARTHING CONDUCTORS (L-S1 - Page S14 - 4 of 6)

PROSPECTIVE EARTH FAULT CURRENT I _{EF} FOR 1 sec. DURATION	MAIN EARTHING BARS (mm x mm)	EARTHING CONDUCTORS (No. x mm x mm)
I ≤ 10 kA	25mm x 3mm	2 sets of 1 x 25mm x 3mm
10 kA < I ≤ 25 kA	25mm x 6mm	2 sets of 1 x 25mm x 3mm
25 kA < I ≤ 30 kA	30mm x 6mm	2 sets of 2 x 25mm x 3mm
30 kA < I ≤ 40 kA	40mm x 6mm	2 sets of 2 x 25mm x 3mm
40 kA < I ≤ 50 kA	50mm x 6mm	2 sets of 2 x 25mm x 3mm

G. ALL WIRING SHALL BE IN G.S. CONDUIT / ELECTROGALVANISED TRUNKING.

DISAHKAN

B.P PENGARAH KANAN CAWANGAN KEJURUTERAAN ELEKTRIK

Ir. HANIZAN BINTI SHAFFII

PENGARAH PERUNDING REKABENTUK

Ir. HUSIN BIN MUSTAFA

JURUTERA ELEKTRIK PENGUASA KANAN

Ir. SITI NOR BINTI HASSAN

JURUTERA ELEKTRIK KANAN

Ir. HAMZAH BIN ISMAIL

JURUTERA ELEKTRIK

Ir. FARAH HANUM BINTI OMAR



CAWANGAN KEJURUTERAAN ELEKTRIK

Ibu Pejabat JKR Malaysia

PROJEK

PEMASANGAN ELEKTRIK BAGI PEMBINAAN KUARTERS BERTINGKAT DI PUSAT KONSERVASI HIDUPAN LIAR SUNGKAI, PERAK

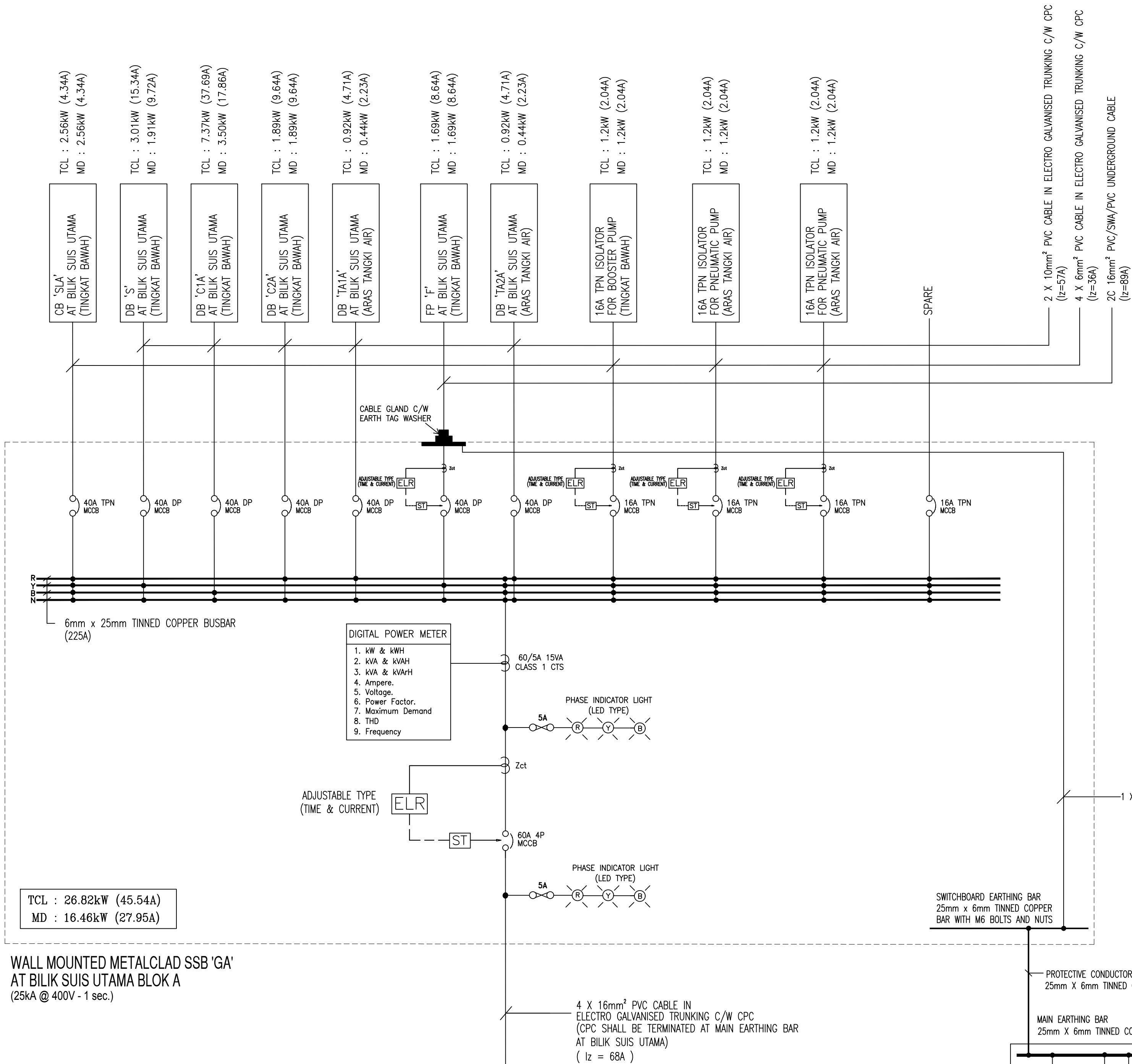
TEMPAT

BILIK SUIS UTAMA (BLOK A)

BUTIR-BUTIR

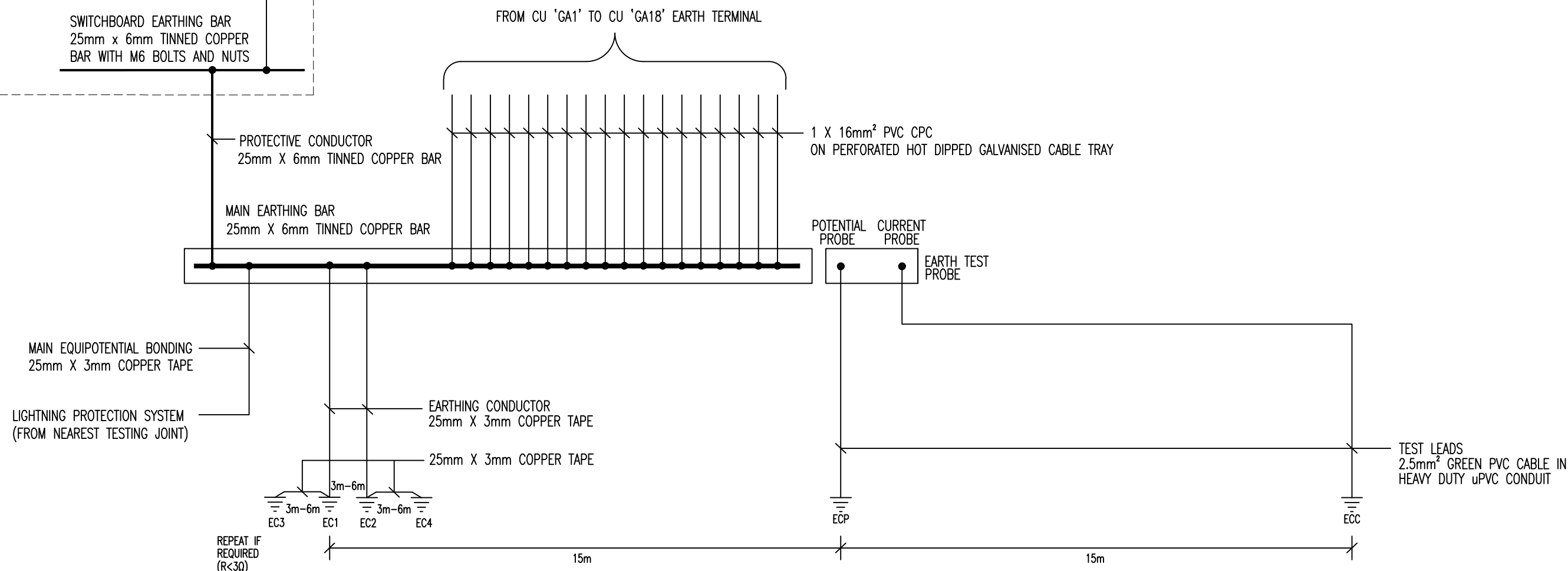
GAMBARAJAH PENDAWAIAN SKEMATIK MSB 'GA'

UKURAN	N.T.S
DISURIH DARI	
DILUKIS OLEH	ROSHIMA BINTI ROMLAI
DISEMAK OLEH	Ir. FARAH HANUM BINTI OMAR
TARIKH	SEPT 2020
BILANGAN FAIL	PKR(L) 59/2017
BILANGAN LUKISAN	PINDAAN
JKR/CKE/BA/G18/LV/2-15	1



WALL MOUNTED METALCLAD SSB 'GA'
AT BILIK SUIS UTAMA BLOK A
(25kA @ 400V - 1 sec.)

FROM TNB kWh METER
AT BILIK METER
TINGKAT BAWAH



NOTE:

EC1/EC2/EC3/EC4

- 16mm dia. X 3000mm (L) copper jacketed (minimum radial thickness 0.25mm) steel core earth electrode c/w 300mm (W) X 300mm (L) X 180mm (H) precast heavy duty concrete earth chamber & cover etc.
- Connection of the copper tape the earth electrode shall be by exothermic welded connections.

ECC/ECP

- 16mm dia. X 1500mm (L) copper jacketed (minimum radial thickness 0.25mm) steel core earth electrode c/w 300mm (W) X 300mm (L) X 180mm (H) precast heavy duty concrete earth chamber & removable concrete cover etc.
- The connection of the 2.5mm² green pvc cable to the earth electrode shall be by clamp.

CATATAN

SWITCHBOARD (SSB & MSB)

	MSB	SSB
A.	Icu & Ics FOR INCOMING MCCB Icu = 50kA @ 400V Ics = 100% of Icu	Icu & Ics FOR INCOMING MCCB Icu = 25kA @ 400V Ics = 100% of Icu
B.	Icu & Ics FOR OUTGOING MCCB Icu = 50kA @ 400V Ics = 50% of Icu	Icu & Ics FOR OUTGOING MCCB Icu = 25kA @ 400V Ics = 50% of Icu

C. SWITCHBOARD CONSTRUCTION :

i) CUBICLE FRONT AND REAR ACCESS (Minimum)	a. FORM of SEPARATION : FORM 2B b. THICKNESS of FRAME : 2.5mm c. THICKNESS of PANEL : 2.0mm d. INDEX of PROTECTION : IP 41
ii) CUBICLE FRONT ACCESS (Minimum)	a. FORM of SEPARATION : FORM 2B b. THICKNESS of FRAME : 2.5mm c. THICKNESS of PANEL : 2.0mm d. INDEX of PROTECTION : IP 41
iii) WALL MOUNTED (Minimum)	a. THICKNESS of FRAME : 2.5mm b. THICKNESS of PANEL : 2.0mm c. INDEX of PROTECTION : IP 41 d. MOUNTING HEIGHT : 750mm FROM FLOOR LEVEL

D. OTHERS

- SWITCHBOARD LABELLING SHALL BE OF MINIMUM 10mm IN HEIGHT AND INCLUDE :
 - SWITCHBOARD MANUFACTURER
 - NAME AND LOCATION OF THE OUT-GOINGS AND INCOMING SUPPLY
- ALL INDICATOR LIGHT SHALL BE OF LED TYPE
- ALL SWITCHBOARD SHALL BE FABRICATED TO SUIT THE ROOM SIZE
- IF THE INCOMING FEEDER CIRCUIT BREAKER IS RATED 400A AND ABOVE SHALL BE PROVIDED WITH PANEL MOUNTING EXTERNAL OPERATING HANDLE WITH PADLOCKING FACILITIES

E. EARTHING

- CONNECTION OF THE EARTHING CONDUCTORS TO THE EARTH ELECTRODES SHALL BE BY EXOTHERMIC WELDED CONNECTIONS
- EARTH ELECTRODES SHALL HAVE PURE COPPER UNIFORMLY MOLECULARLY BONDED ONTO A HIGH TENSILE STEEL CORE TO A MINIMUM OF THICKNESS OF 0.25mm

F. TABLE 14A - DIMENSIONS OF THE MAIN EARTHING BARS AND EARTHING CONDUCTORS (L-S1 - Page S14 - 3 of 5)

PROSPECTIVE EARTH FAULT CURRENT (I) FOR 1 sec. DURATION	MAIN EARTHING BARS (WIDTH x THICKNESS)	EARTHING CONDUCTORS (No. x COPPER TAPE SIZE)
I ≤ 10 kA	25mm x 3mm	2 Sets of 1 x 25mm x 3mm
10 kA < I ≤ 25 kA	25mm x 6mm	2 Sets of 1 x 25mm x 3mm
25 kA < I ≤ 30 kA	30mm x 6mm	2 Sets of 2 x 25mm x 3mm
30 kA < I ≤ 40 kA	40mm x 6mm	2 Sets of 2 x 25mm x 3mm
40 kA < I ≤ 50 kA	50mm x 6mm	2 Sets of 2 x 25mm x 3mm

DISAHKAN

PENGARAH KANAN

Ir. HJ. YAAKOB BIN ABDUL LATIF

PENGARAH PERUNDUNG REKABENTUK

Ir. SHAMSURIEE BIN SULAIMAN

JURUTERA ELEKTRIK PENGUASA KANAN

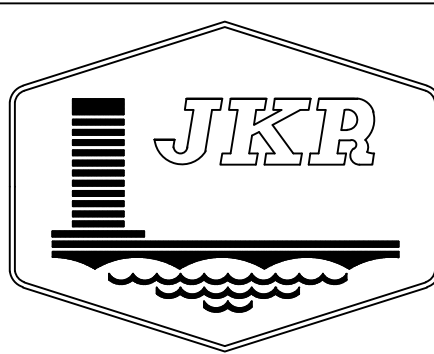
Ir. SITI NOR BINTI HASSAN

JURUTERA ELEKTRIK KANAN

Ir. HAMZAH BIN ISMAIL

JURUTERA ELEKTRIK

Ir. FARAH HANUM BINTI OMAR



Ibu Pejabat JKR Malaysia

PROJEK

PRE - APPROVED PLAN (PAP) KUARTERS KELAS G
- PANGSA 5 TINGKAT (18 UNIT)

TEMPAT

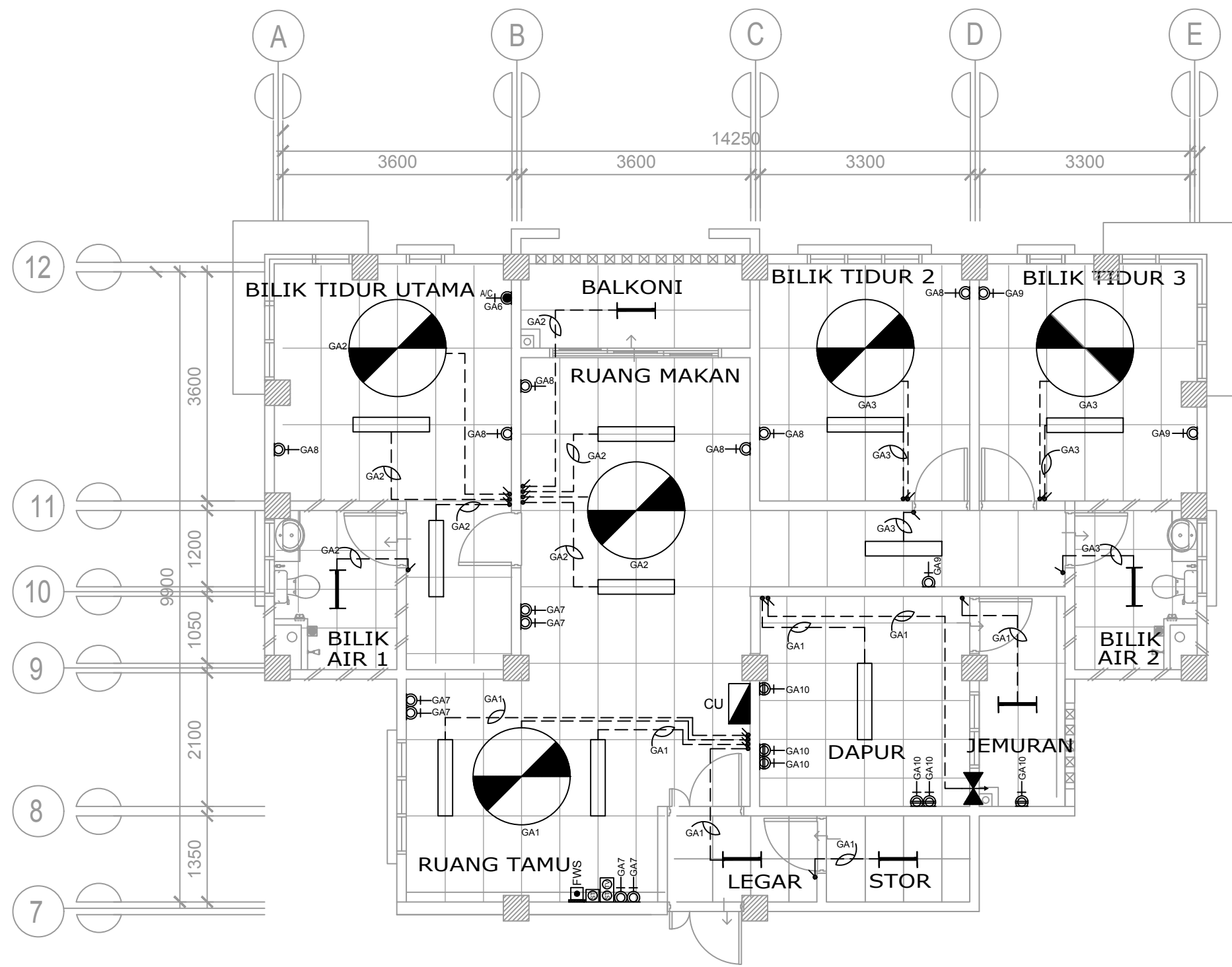
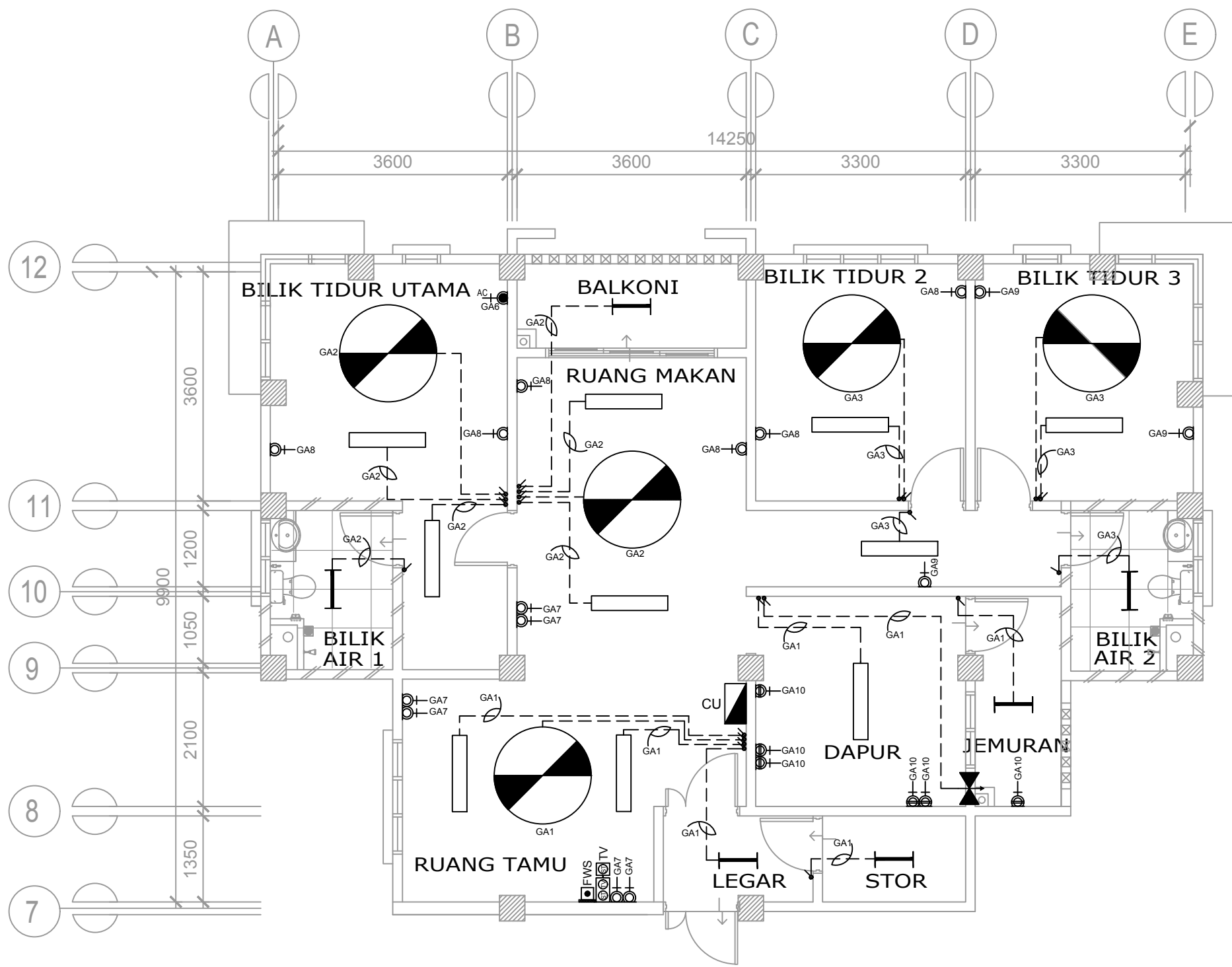
BILIK SUIS UTAMA (BLOK A)

BUTIR-BUTIR

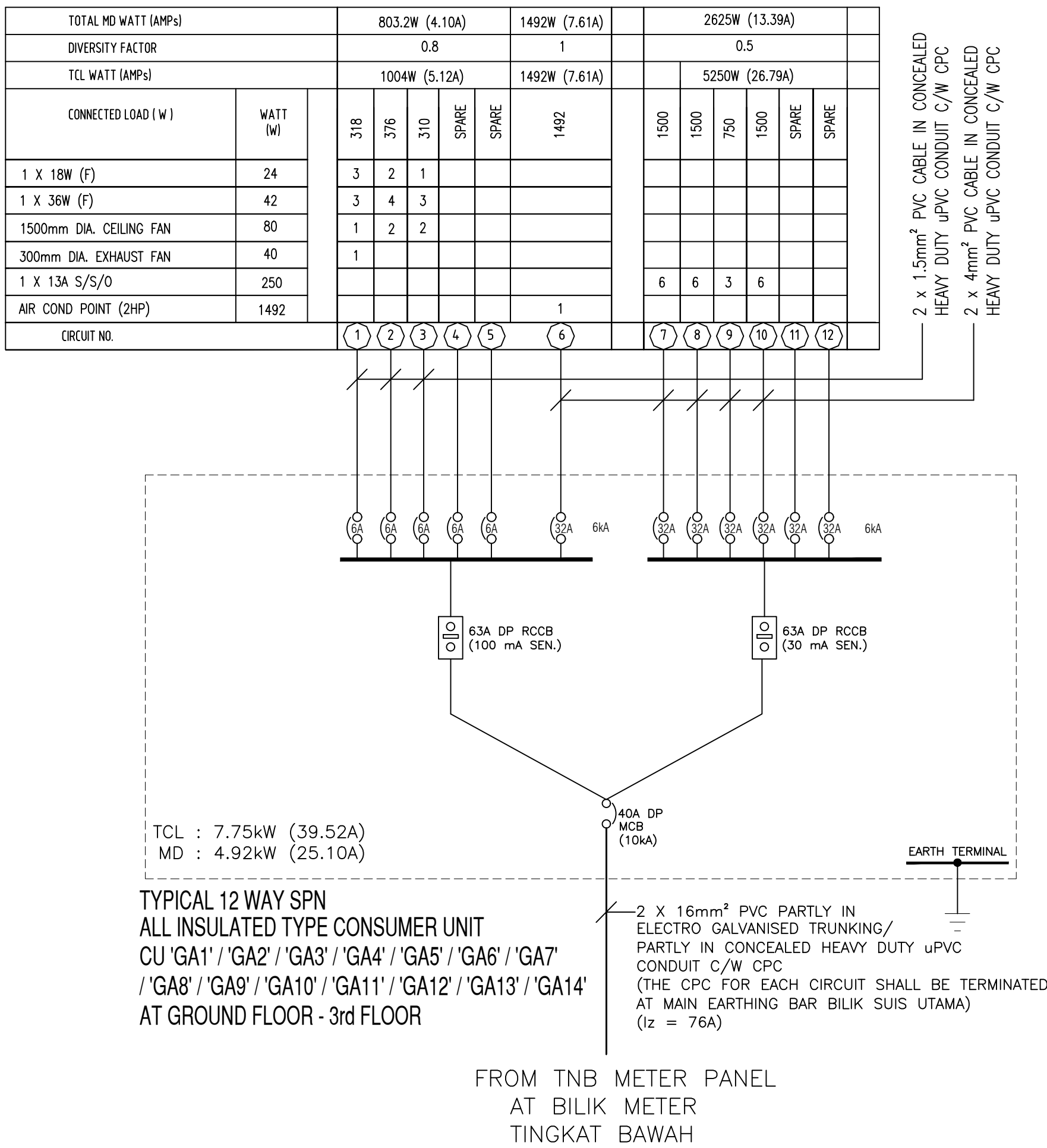
GAMBARAJAH PENDAWAIAN SKEMATIK SSB 'GA'

UKURAN	N.T.S
DISURIH DARI	
DILUKIS OLEH	MOHD AMREE BIN ZAHARUDDIN
DISEMAK OLEH	Ir. FARAH HANUM BINTI OMAR
TARIKH	FEBRUARI 2020
BILANGAN FAIL	PKR(L) 36/2017

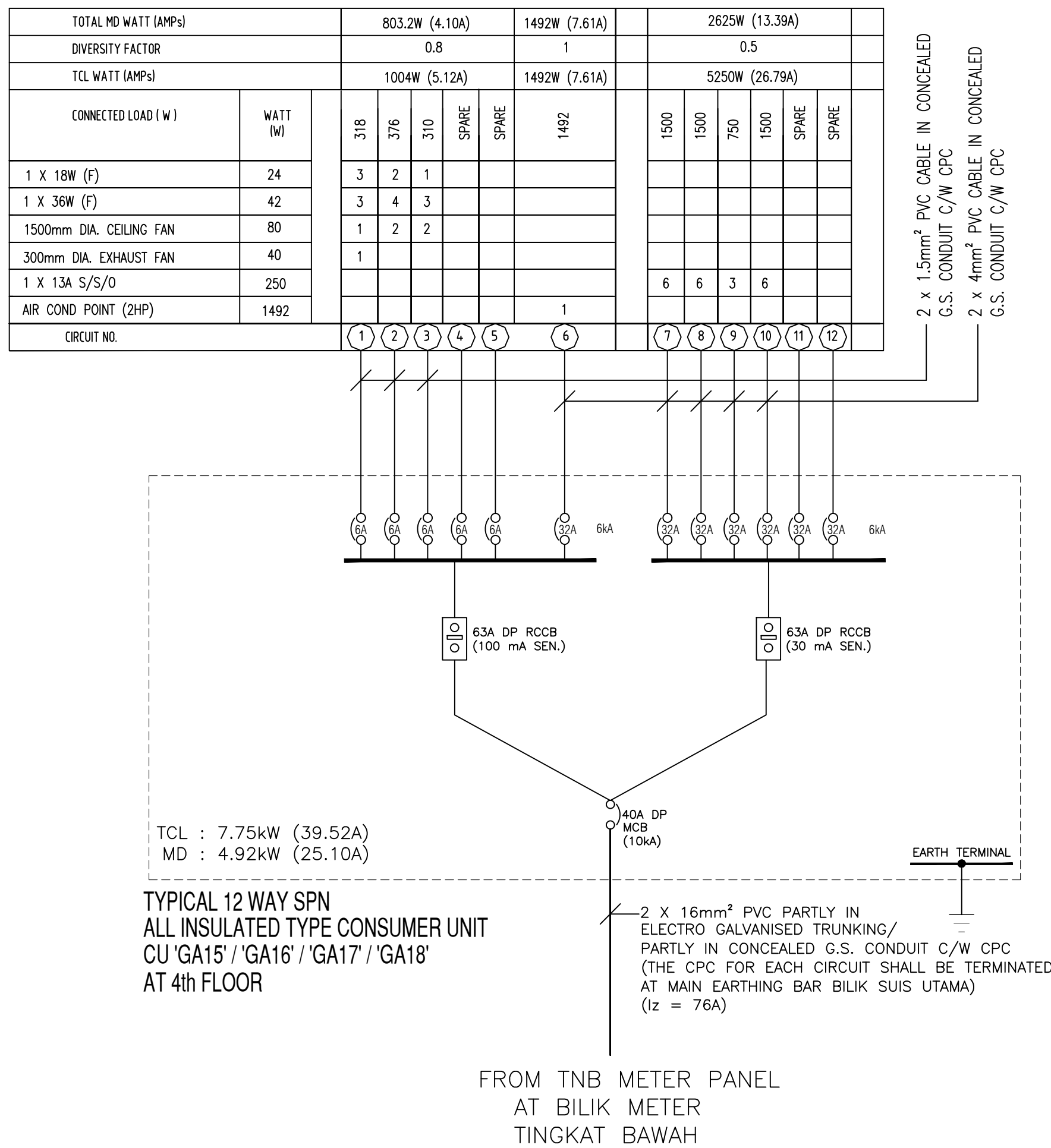
BILANGAN LUKISAN	PINDAAN
JKR/CKE/BA/G18/LV/3-15	1



UNIT TIPIKAL TINGKAT BAWAH - TINGKAT 3



UNIT TIPIKAL TINGKAT 4



PETUNJUK :

SYMBOL	DESCRIPTION	QTY. (PER UNIT)	QTY. (18 UNIT)
	1 X 18W (F) CEILING MOUNTED BARE CHANNEL	6	108
	1 X 36W (F) CEILING MOUNTED BARE CHANNEL	10	180
	1500mm DIA. CEILING FAN C/W REGULATOR AND SAFETY WIRE	5	90
	300mm DIA. EXHAUST FAN	1	18
	1 GANG 13A 3 PIN SWITCHED SOCKET OUTLET (1450mm ABOVE FINISHED FLOOR LEVEL)	15	270
	32A DP SWITCH WITH NEON INDICATOR LIGHT AND 15A ROUND 3 PIN SWITCHED SOCKET OUTLET FOR AIRCOND (300mm BELOW CEILING LEVEL AND NEAREST TO THE A/C UNIT)	6	108
	1 WAY 10A SP BIC ROCKER SWITCH (1000mm ABOVE FINISHED FLOOR LEVEL)	1	18
	ALL INSULATED TYPE CONSUMER UNIT	22	396
	ALL INSULATED TYPE CONSUMER UNIT	1	18

PETUNJUK : TELEFON

SYMBOL	DESCRIPTION	QTY. (PER UNIT)	QTY. (18 UNIT)
	FIRE WALL SOCKET (400mm ABOVE FINISHED FLOOR LEVEL)	1	18

PETUNJUK : SMATV

SYMBOL	DESCRIPTION	QTY. (PER UNIT)	QTY. (18 UNIT)
	DUAL SATELLITE AND TV OUTLET (400mm ABOVE FINISHED FLOOR LEVEL)	1	18
	SATELLITE OUTLET (400mm ABOVE FINISHED FLOOR LEVEL)	1	18

CATATAN

DISTRIBUTION BOARD

- UNLESS OTHERWISE SPECIFIED, ALL RCCBs SHALL HAVE THE FOLLOWING SENSITIVITIES:
DP RCCB - 100mA (FOR DB LIGHTING, DB (COMPUTER) S/S/O & DB A/CON)
DP RCCB - 30mA (FOR SWITCHED SOCKET OUTLET)
- UNLESS OTHERWISE SPECIFIED, ALL MCBs SHALL HAVE A MINIMUM BREAKING CAPACITY OF 6kA
- CABLE SIZE FOR LIGHTING FINAL CIRCUIT :-
MCB RATING CABLE SIZE
6A 2 x 1.5 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 1.5 sq. mm PVC CPC
10A 2 x 2.5 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 2.5 sq. mm PVC CPC
10A (FR-MIMS) 2 x 2.5 sq. mm MIMS CABLE IN CONCEALED G.S CONDUIT C/W 1 x 2.5 sq. mm MIMS CPC
20A (WATER HEATER) 2 x 4 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 4 sq. mm PVC CPC
32A (A/C SPLIT UNIT) 2 x 4 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 4 sq. mm PVC CPC

CABLE SIZE FOR POWER FINAL CIRCUIT :-

NOS OF S/S/O	MCB RATING	CABLE SIZE
1	16A	2 x 2.5 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 2.5 sq. mm PVC CPC
2	20A	2 x 2.5 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 2.5 sq. mm PVC CPC
3 to 10	32A (Ring Circuit)	2 x 2.5 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 2.5 sq. mm PVC CPC
3 to 6	32A (Radial Circuit)	2 x 4 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 4 sq. mm PVC CPC

ISOLATOR RATING	CABLE SIZE
15A SPN ISOLATOR	2 x 6 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 6 sq. mm PVC CPC
20A SPN ISOLATOR	2 x 6 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 6 sq. mm PVC CPC
30A SPN ISOLATOR	2 x 10 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 10 sq. mm PVC CPC
15A TPN ISOLATOR	4 x 6 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 6 sq. mm PVC CPC
20A TPN ISOLATOR	4 x 10 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 10 sq. mm PVC CPC
30A TPN ISOLATOR	4 x 10 sq. mm PVC IN CONCEALED G.S CONDUIT C/W 1 x 10 sq. mm PVC CPC

CROSS-SECTIONAL AREA OF CIRCUIT PROTECTIVE CONDUCTORS (CPC)

CROSS-SECTIONAL AREA OF PHASE CONDUCTOR	MIN. CROSS-SECTIONAL AREA OF THE CORRESPONDENT PROTECTIVE CONDUCTOR (EARTH WIRE)
S sq. mm	S sq. mm
S < 16	S
16 ≤ S ≤ 35	16
S > 35	S/2

THE ABOVE NOTES ALSO APPLY TO ALL DRAWINGS

DISAHKAN

PENGARAH KANAN

Ir. HJ. YAAKOB BIN ABDUL LATIF

PENGARAH PERUNDING REKABENTUK

Ir. SHAMSURIEE BIN SULAIMAN

JURUTERA ELEKTRIK PENGUASA KANAN

Ir. SITI NOR BINTI HASSAN

JURUTERA ELEKTRIK KANAN

Ir. HAMZAH BIN ISMAIL

JURUTERA ELEKTRIK

Ir. FARAH HANUM BINTI OMAR



Ibu Pejabat JKR Malaysia

PROJEK

PRE - APPROVED PLAN (PAP) KUARTERS KELAS G - PANGSA 5 TINGKAT (18 UNIT)

TEMPAT

KUARTERS KELAS G (18 UNIT)

BUTIR-BUTIR

PELAN SUSUNATUR LAMPU, SOKET, TELEFON, SMATV, PETUNJUK, GAMBARAJAH PENDAWAIAN SKEMATIK CU 'GA1' - 'GA14' DAN CU 'GA15' - 'GA18' (UNIT TIPIKAL)

UKURAN	1 : 75
DISURIH DARI	
DILUKIS OLEH	MOHD AMREE BIN ZAHARUDDIN
DISEMAK OLEH	Ir. FARAH HANUM BINTI OMAR
TARIKH	FEBRUARI 2020
BILANGAN FAIL	

BILANGAN LUKISAN	PINDAAN
JKR/CKE/BA/G18/LV/4-15	1