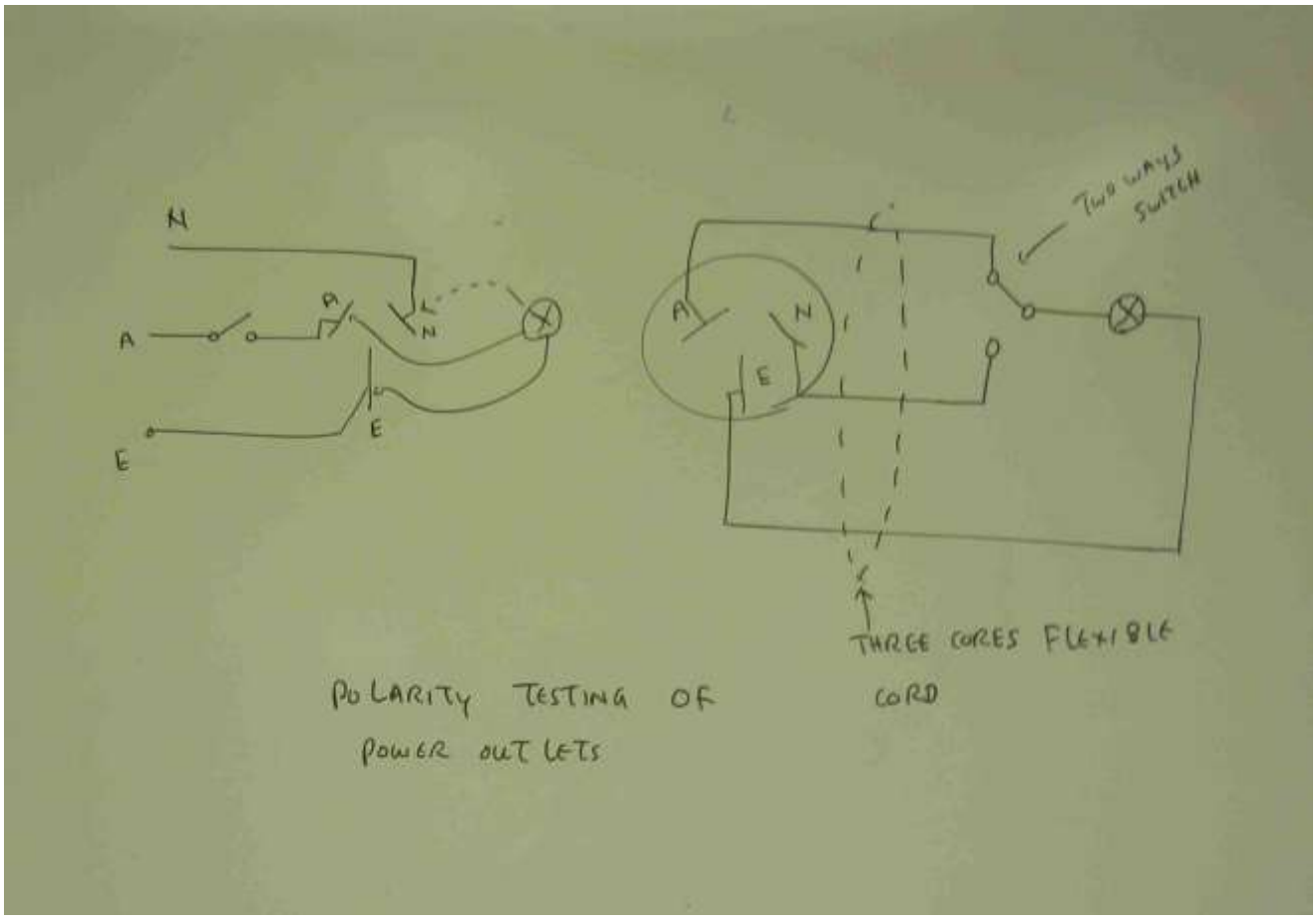
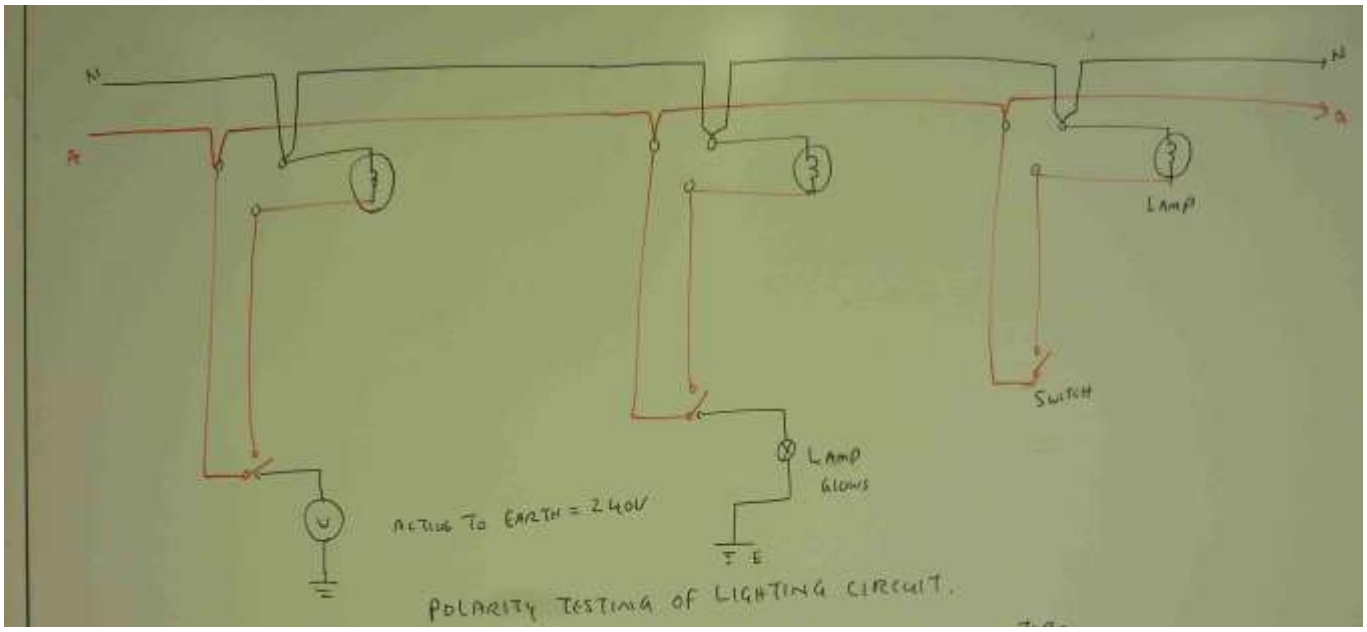
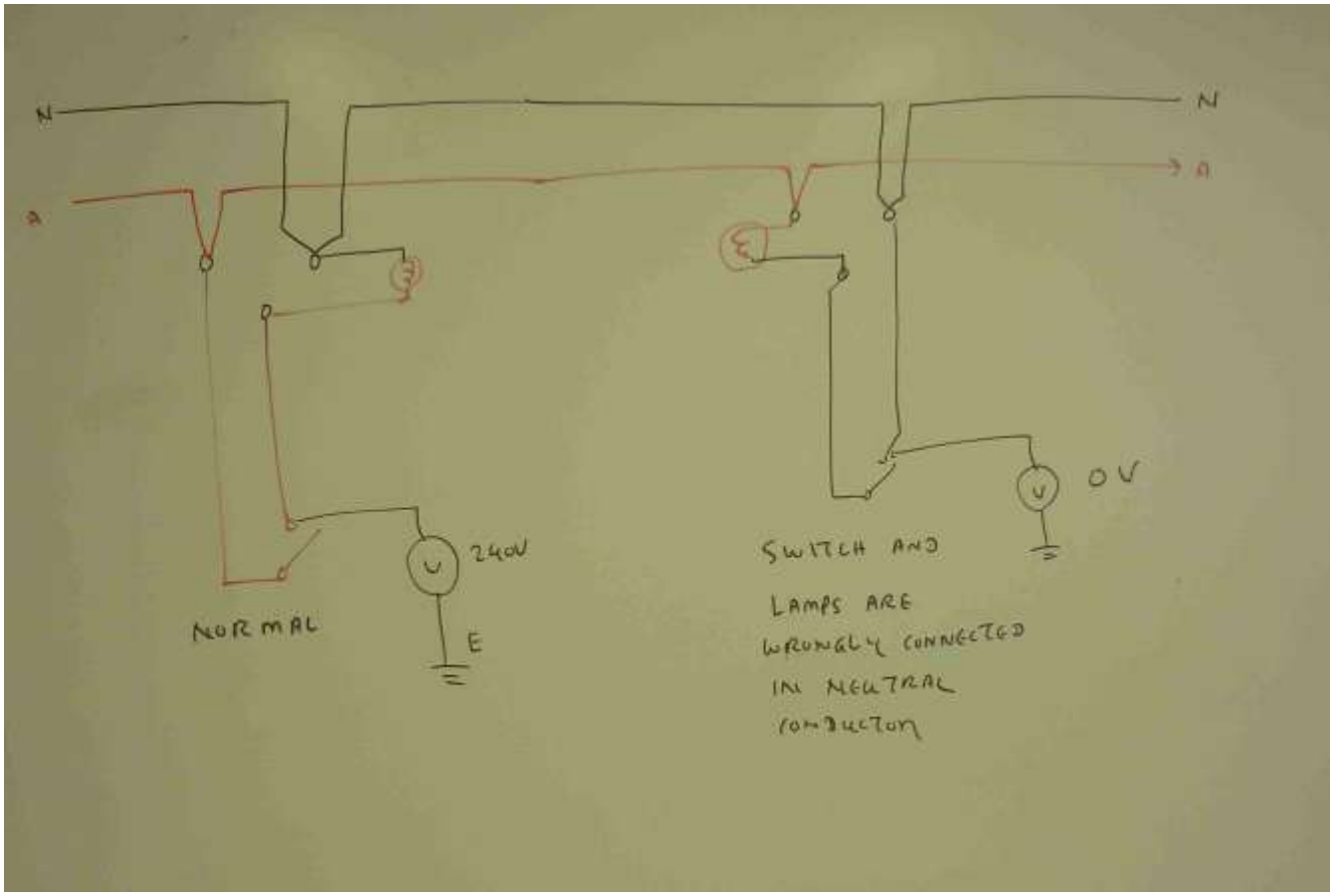
Advanced Wiring

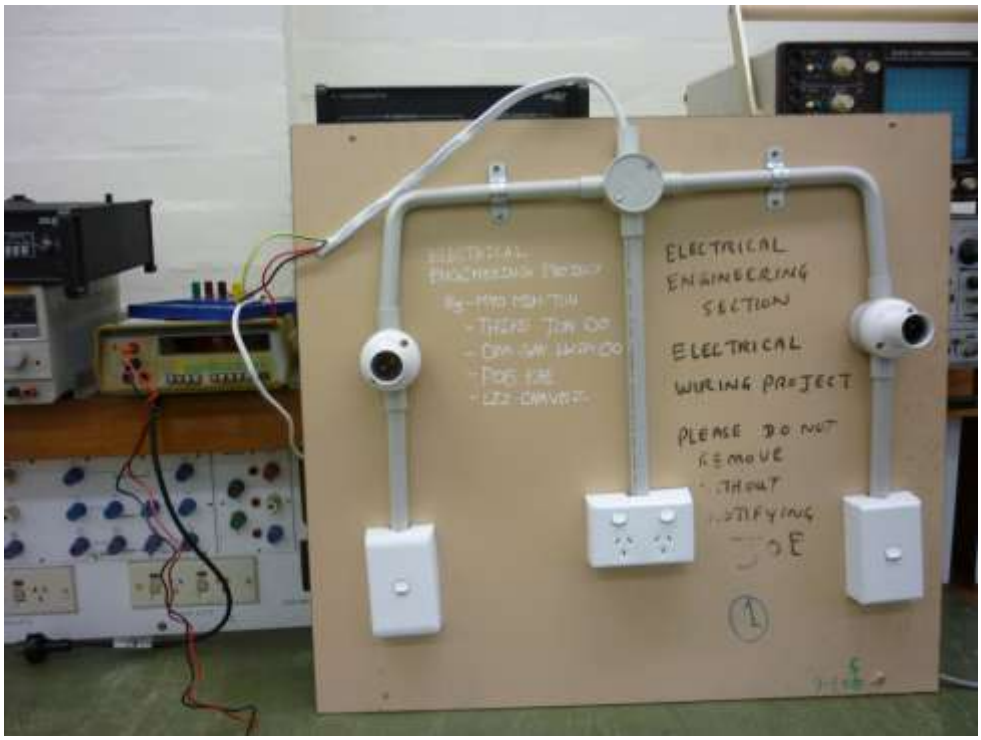
Practical (1) Electrical Installation Safety Testing

Perform Electrical Safety Testing on given switch board by applying the standard safety test procedures


N
A
E
L
N
E
C
A
N
E
TWO WAYS SWITCH
THREE CORES FLEXIBLE CORD
POLARITY TESTING OF POWER OUTLETS


N
A
N
A
LAMP
SWITCH
LAMP GLOWS
ACTING TO EARTH = 240V
E
POLARITY TESTING OF LIGHTING CIRCUIT.


N
A
240V
NORMAL
E
N
A
0V
SWITCH AND
LAMPS ARE
WRONGLY CONNECTED
IN NEUTRAL
CONDUCTOR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ENGINEERING
SECTION
ELECTRICAL
WIRING PROJECT
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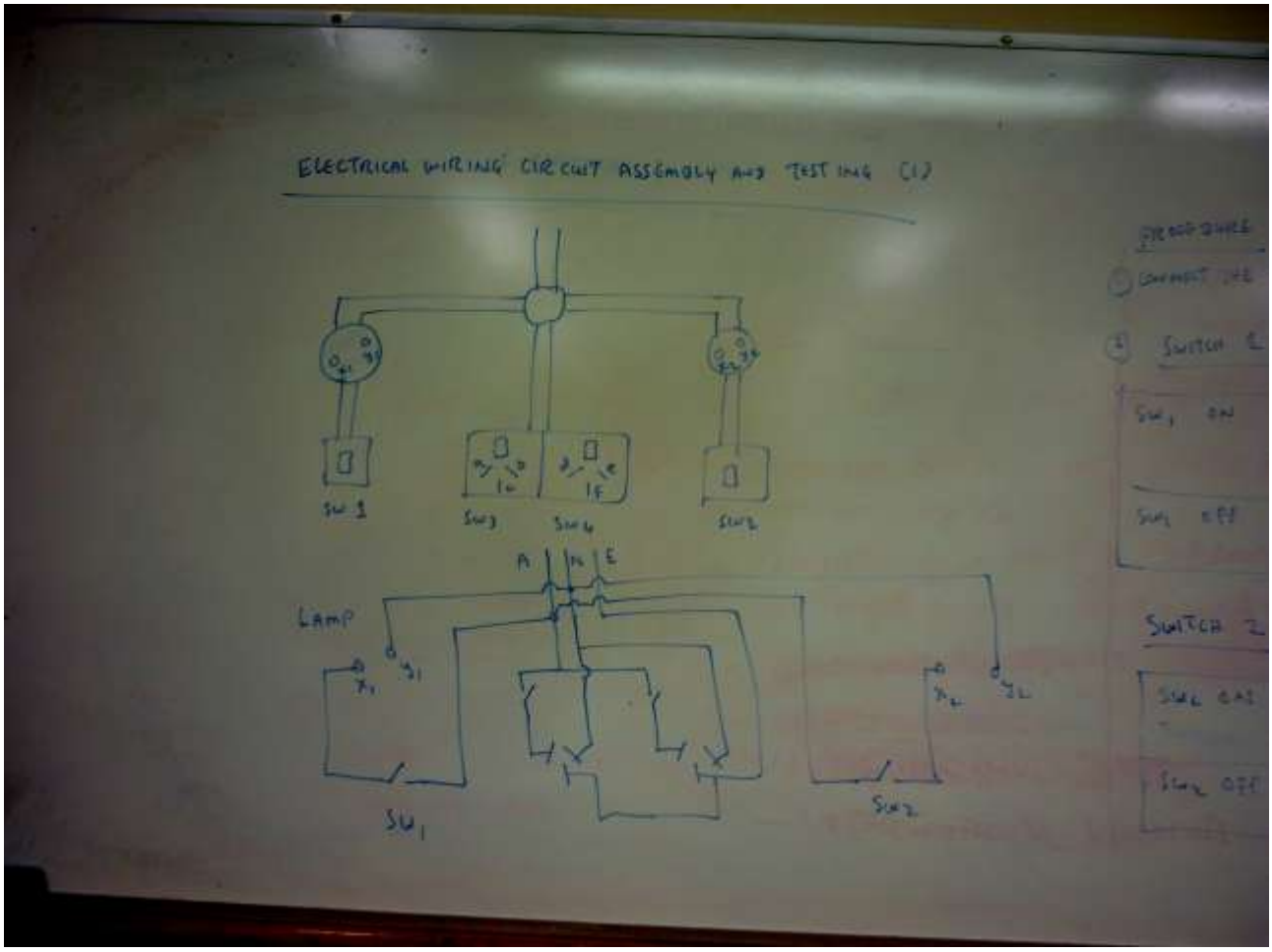
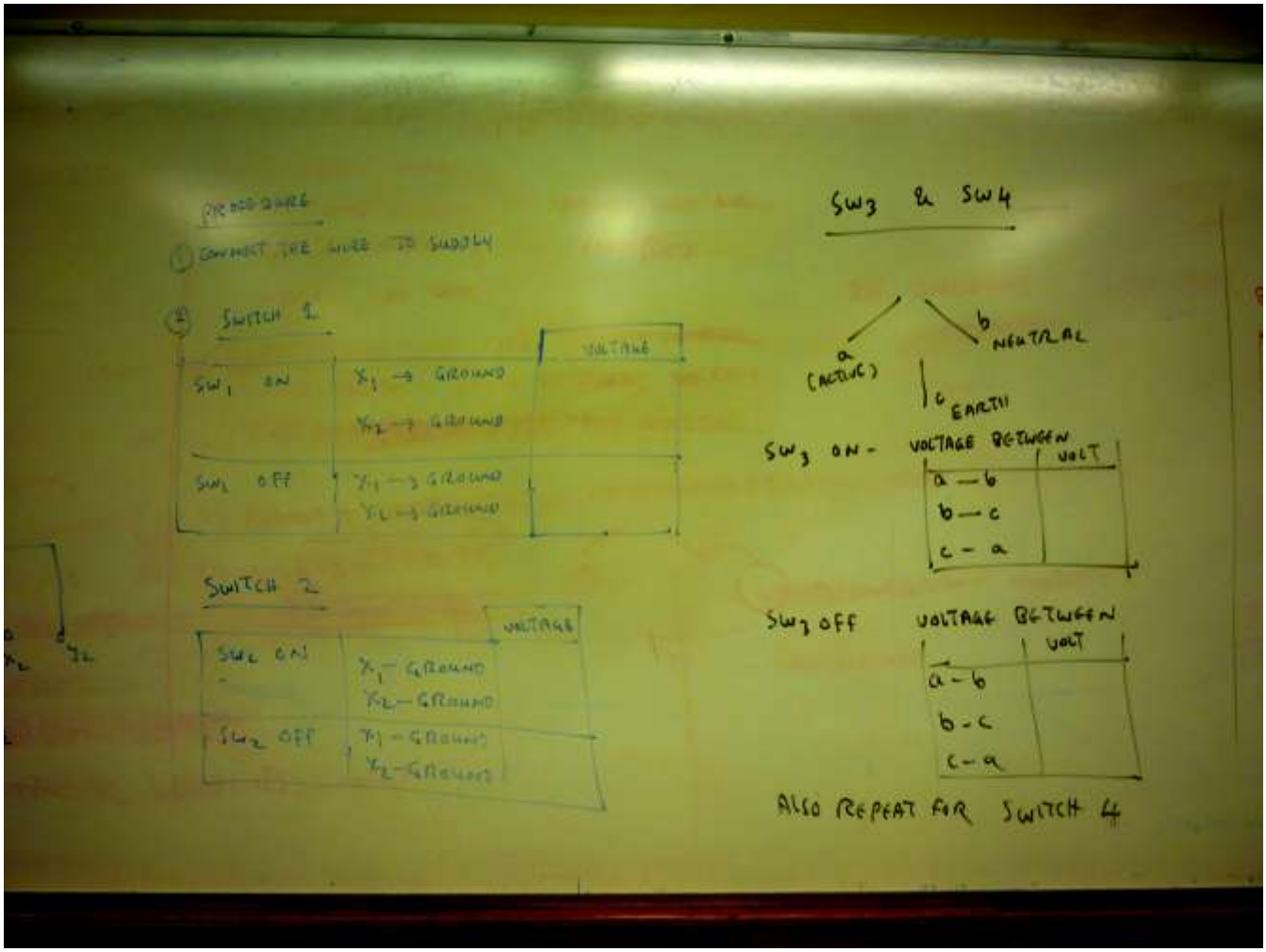
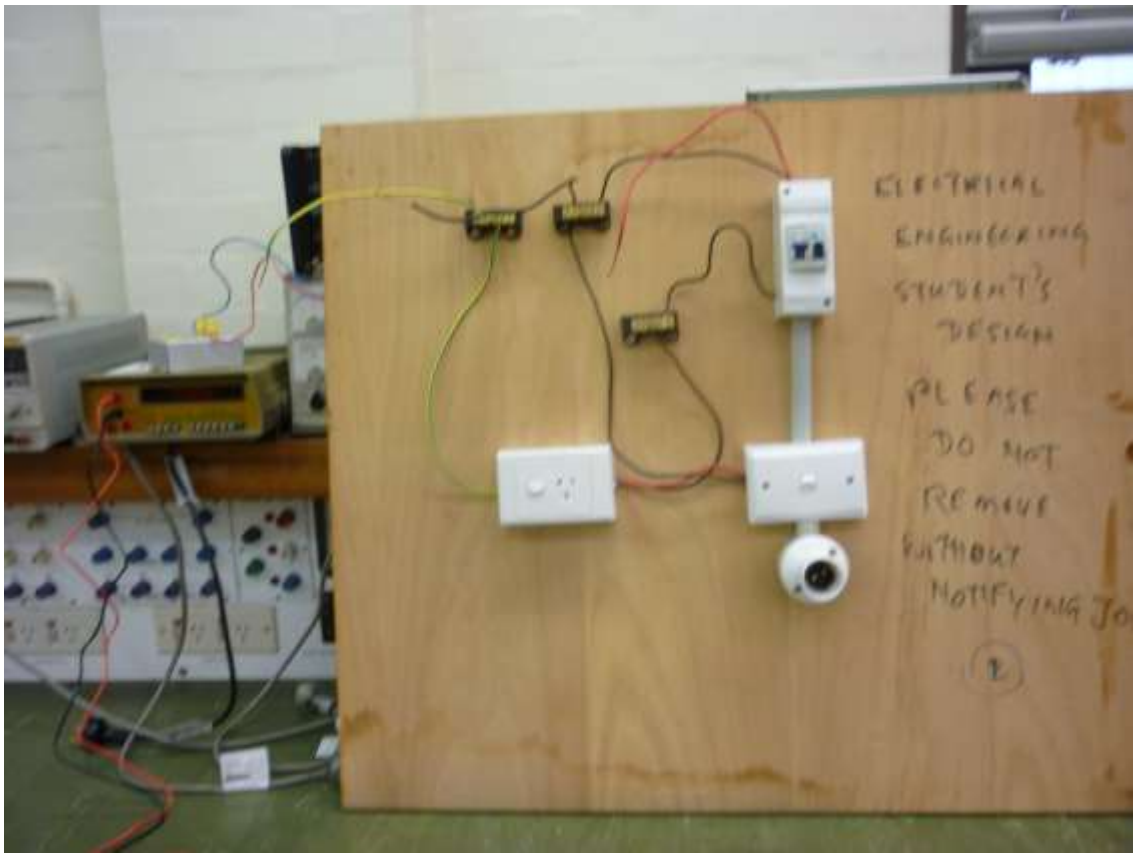
WITHOUT
MODIFYING
E
1


ELECTRICAL WIRING CIRCUIT ASSEMBLY AND TESTING (1)
SW 1
SW3
SW4
SW2
LAMP
A
N
E
SW1
SW2
SWITCH 2


PROCEDURE
1. CONNECT THE WIRE TO SUPPLY
2. SWITCH 1
VOLTAGE
SW1 ON
X1 → GROUND
X2 → GROUND
SW1 OFF
X1 → GROUND
X2 → GROUND
SWITCH 2
VOLTAGE
SW2 ON
X1 – GROUND
X2 – GROUND
SW2 OFF
X1 – GROUND
X2 – GROUND
SW3 & SW4
a (ACTIVE)
b NEUTRAL
c EARTH
SW3 ON – VOLTAGE BETWEEN
VOLT
a — b
b — c
c — a
SW3 OFF VOLTAGE BETWEEN
VOLT
a – b
b – c
c – a
ALSO REPEAT FOR SWITCH 4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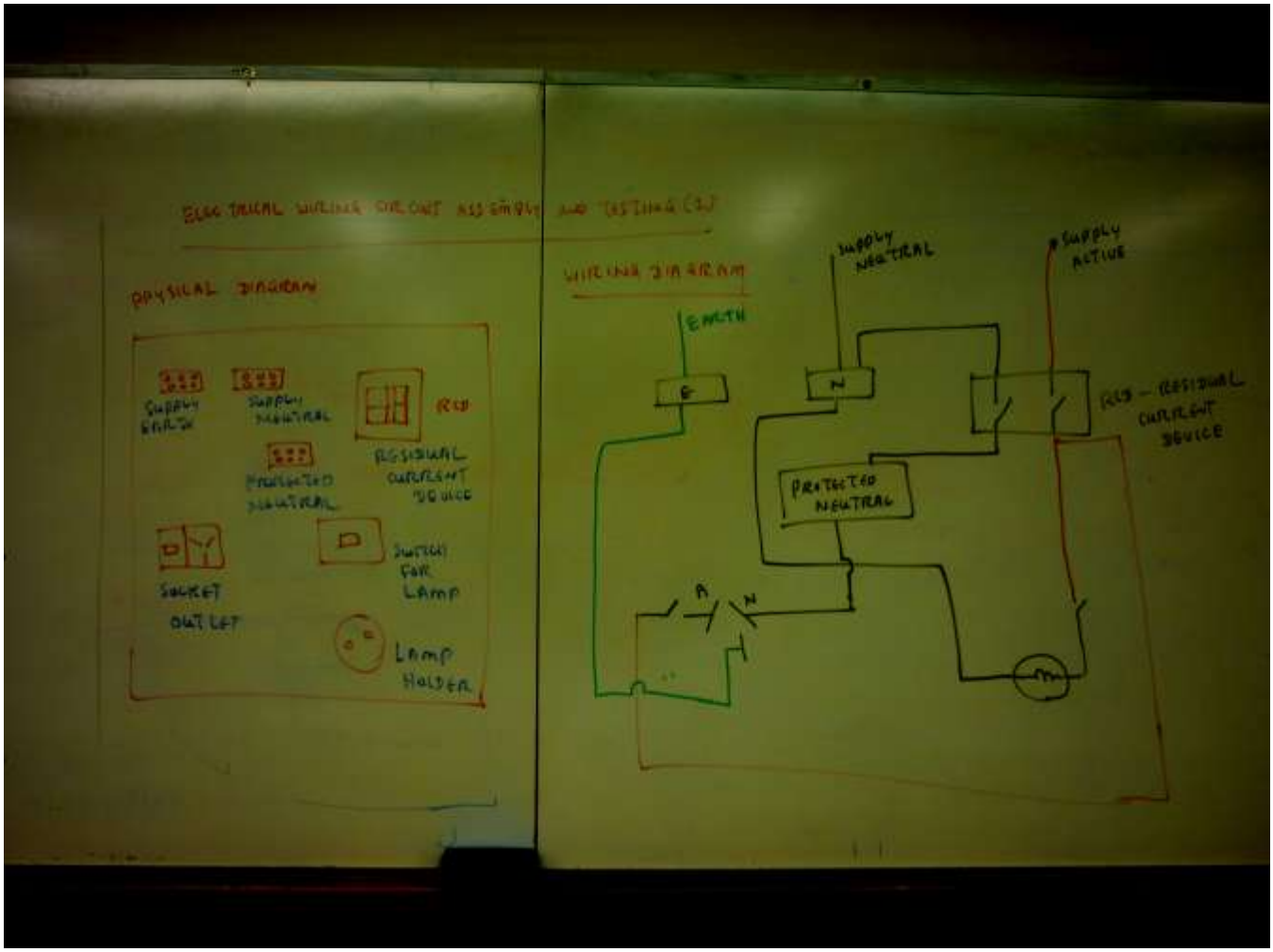
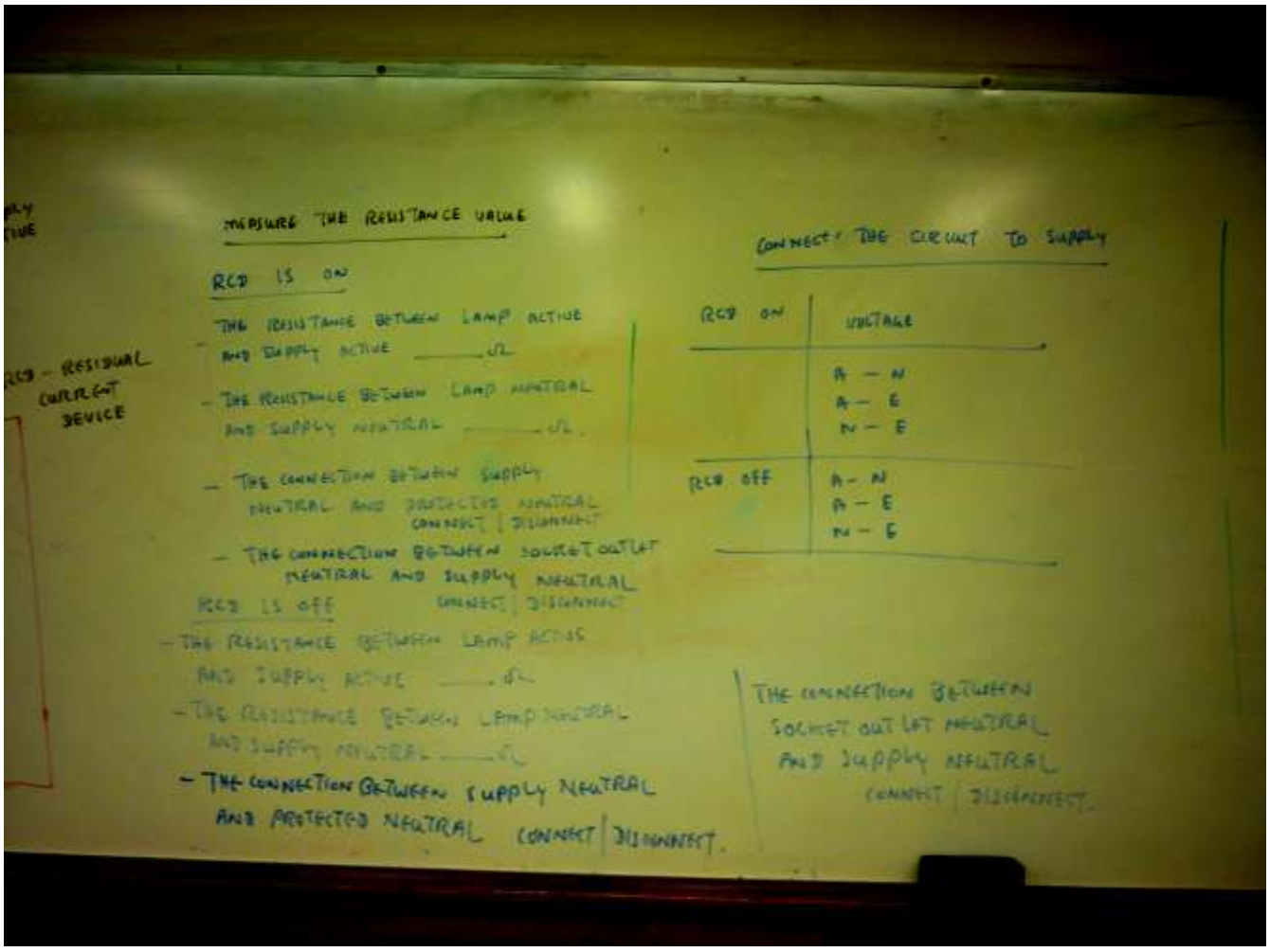
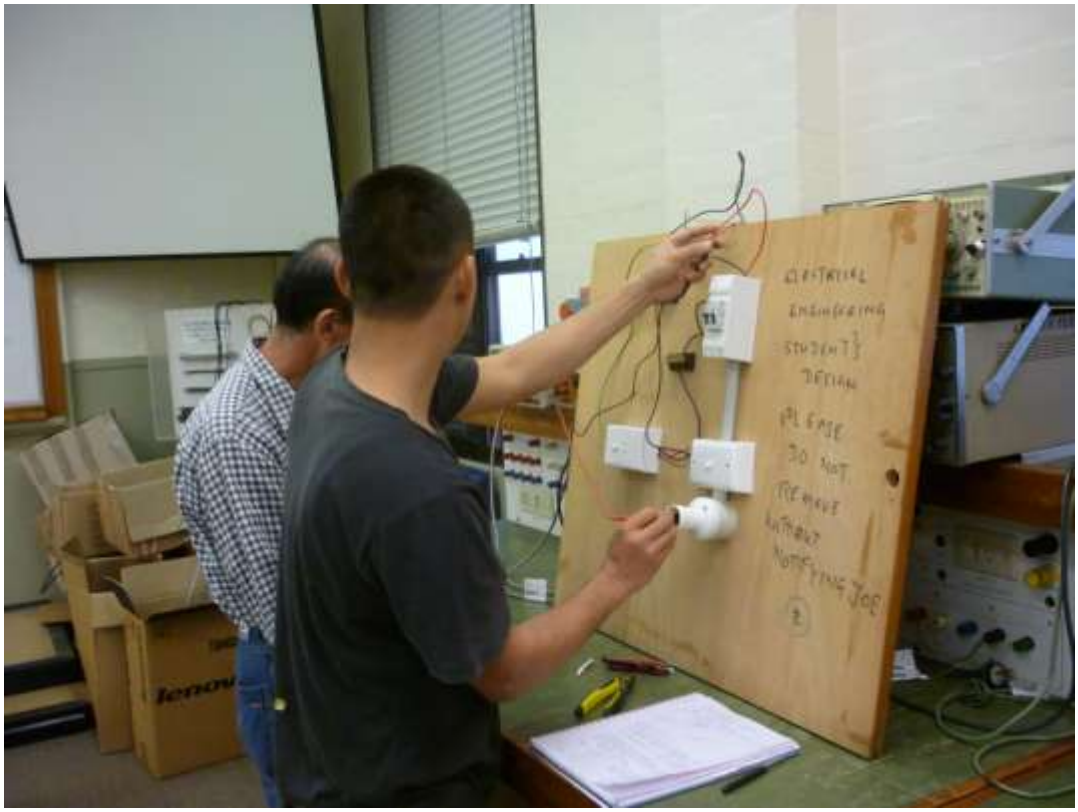
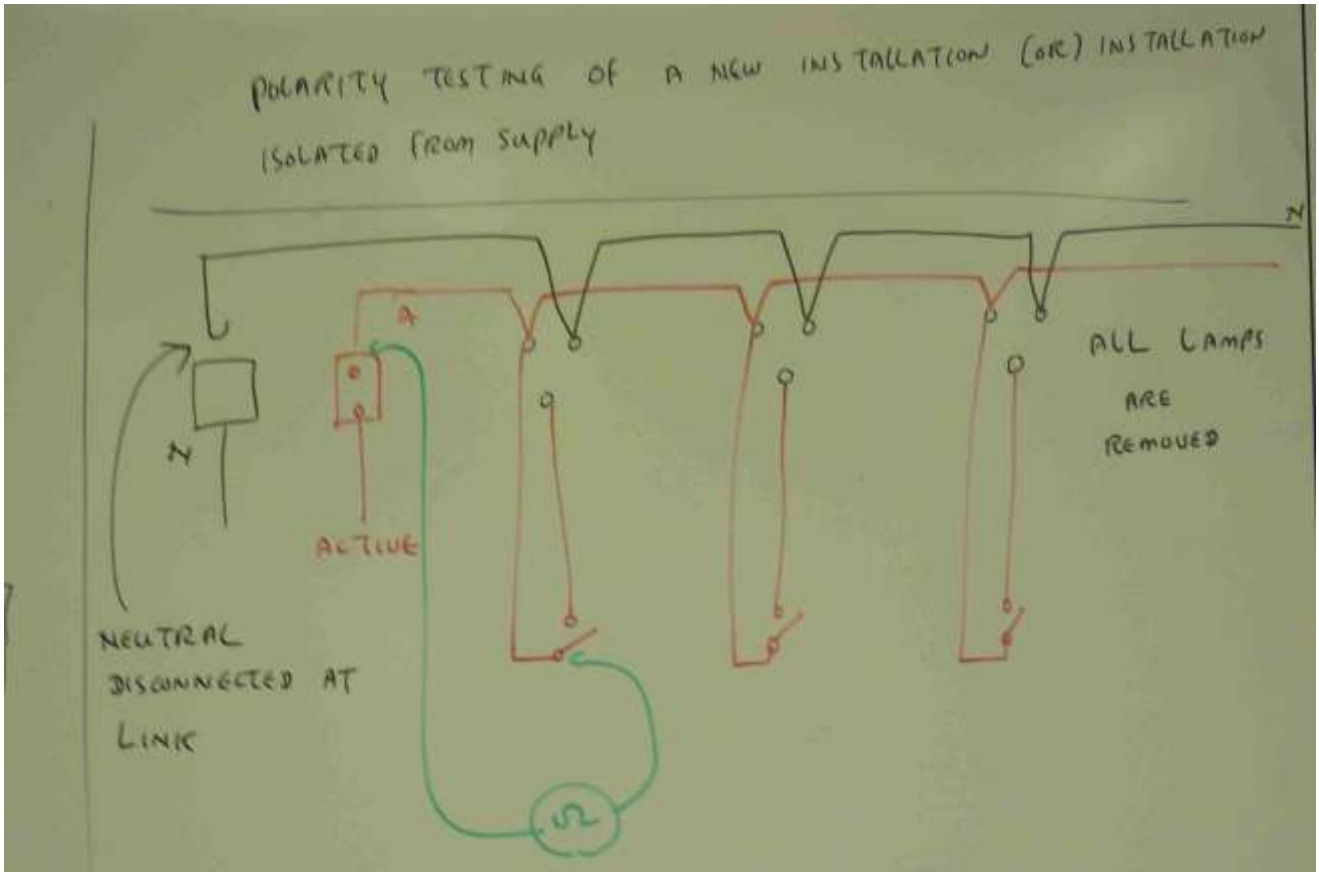
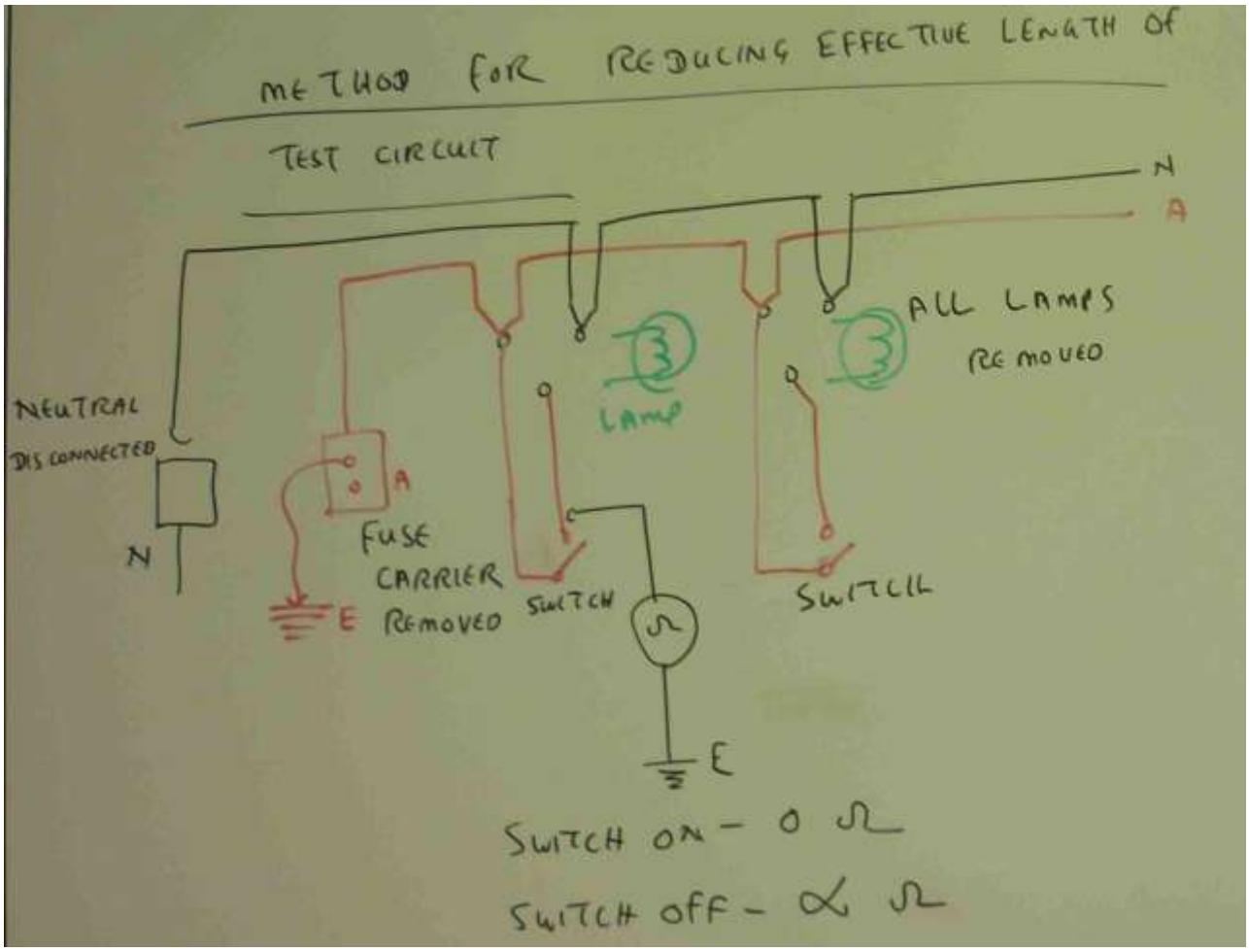

ELECTRICAL WIRING CIRCUIT ASSEMBLY AND TESTING (2)
PHYSICAL DIAGRAM
SUPPLY ACTIVE
SUPPLY NEUTRAL
PROTECTED NEUTRAL
RCD
RESIDUAL CURRENT DEVICE
SOCKET OUTLET
SWITCH FOR LAMP
LAMP HOLDER
WIRING DIAGRAM
EARTH
SUPPLY NEUTRAL
SUPPLY ACTIVE
E
N
RCD - RESIDUAL CURRENT DEVICE
PROTECTED NEUTRAL
A
N


MEASURE THE RESISTANCE VALUE
RCD IS ON
- THE RESISTANCE BETWEEN LAMP ACTIVE AND SUPPLY ACTIVE _____ Ω
- THE RESISTANCE BETWEEN LAMP NEUTRAL AND SUPPLY NEUTRAL _____ Ω.
- THE CONNECTION BETWEEN SUPPLY NEUTRAL AND PROTECTED NEUTRAL CONNECT | DISCONNECT
- THE CONNECTION BETWEEN SOCKET OUTLET NEUTRAL AND SUPPLY NEUTRAL CONNECT | DISCONNECT
RCD IS OFF
- THE RESISTANCE BETWEEN LAMP ACTIVE AND SUPPLY ACTIVE _____ Ω
- THE RESISTANCE BETWEEN LAMP NEUTRAL AND SUPPLY NEUTRAL _____ Ω
- THE CONNECTION BETWEEN SUPPLY NEUTRAL AND PROTECTED NEUTRAL CONNECT | DISCONNECT.
RCD - RESIDUAL CURRENT DEVICE
CONNECT THE CIRCUIT TO SUPPLY
RCD ON | VOLTAGE
A - N
A - E
N - E
RCD OFF
A - N
A - E
N - E
THE CONNECTION BETWEEN SOCKET OUTLET NEUTRAL AND SUPPLY NEUTRAL CONNECT | DISCONNECT.

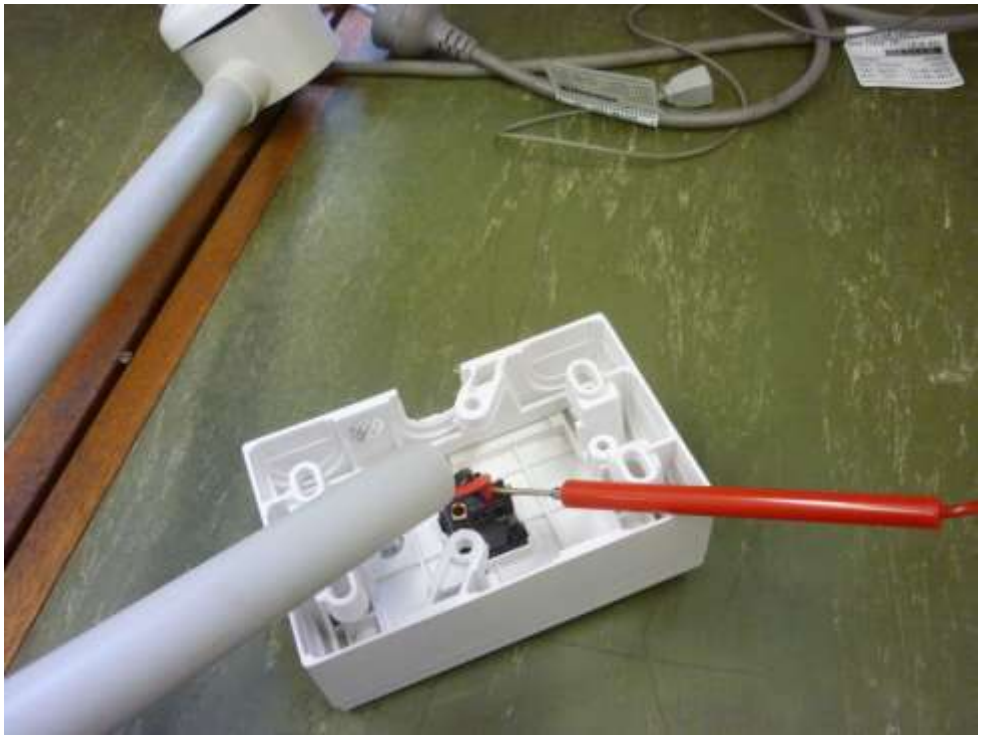


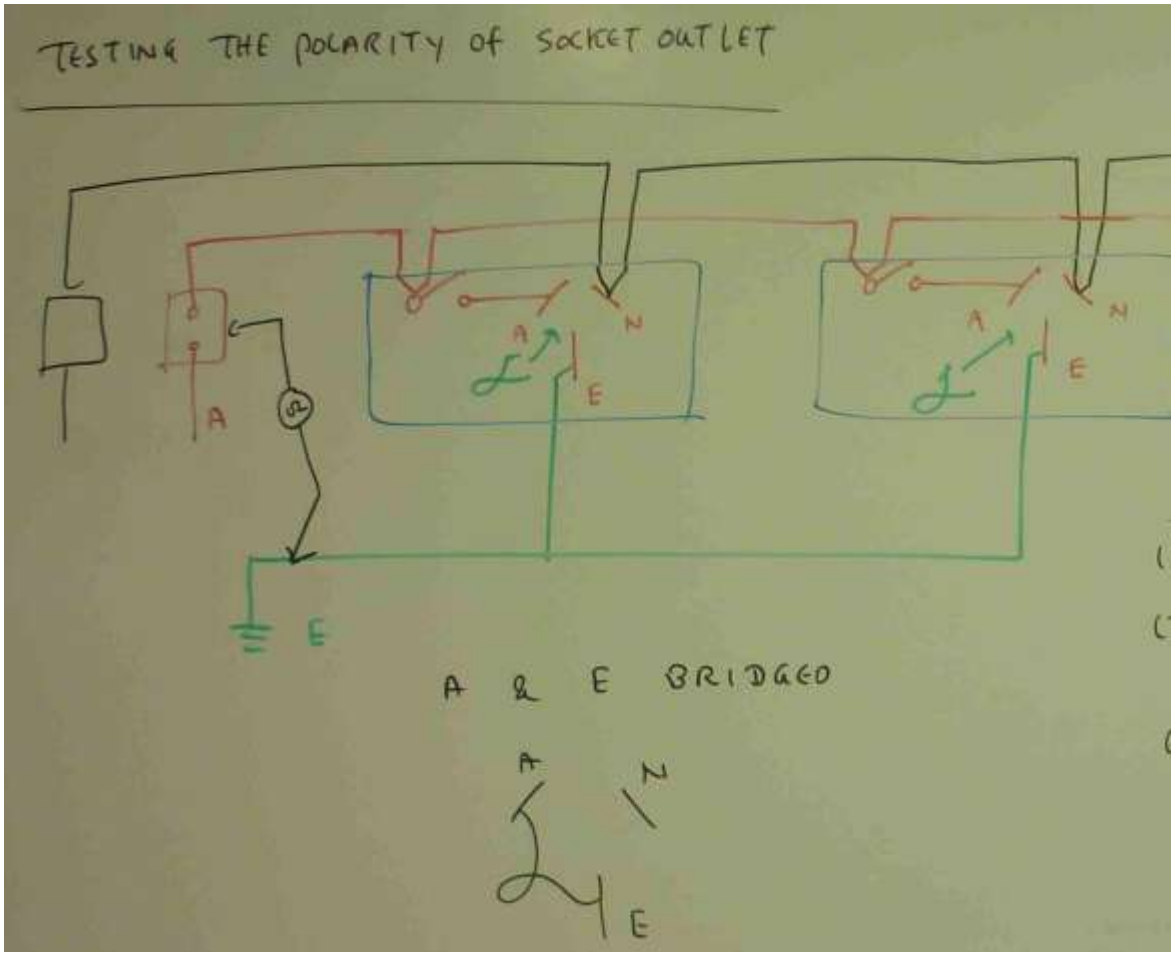

POLARITY TESTING OF A NEW INSTALLATION (OR) INSTALLATION
ISOLATED FROM SUPPLY
N
A
ALL LAMPS
ARE
REMOVED
N
ACTIVE
NEUTRAL
DISCONNECTED AT
LINK

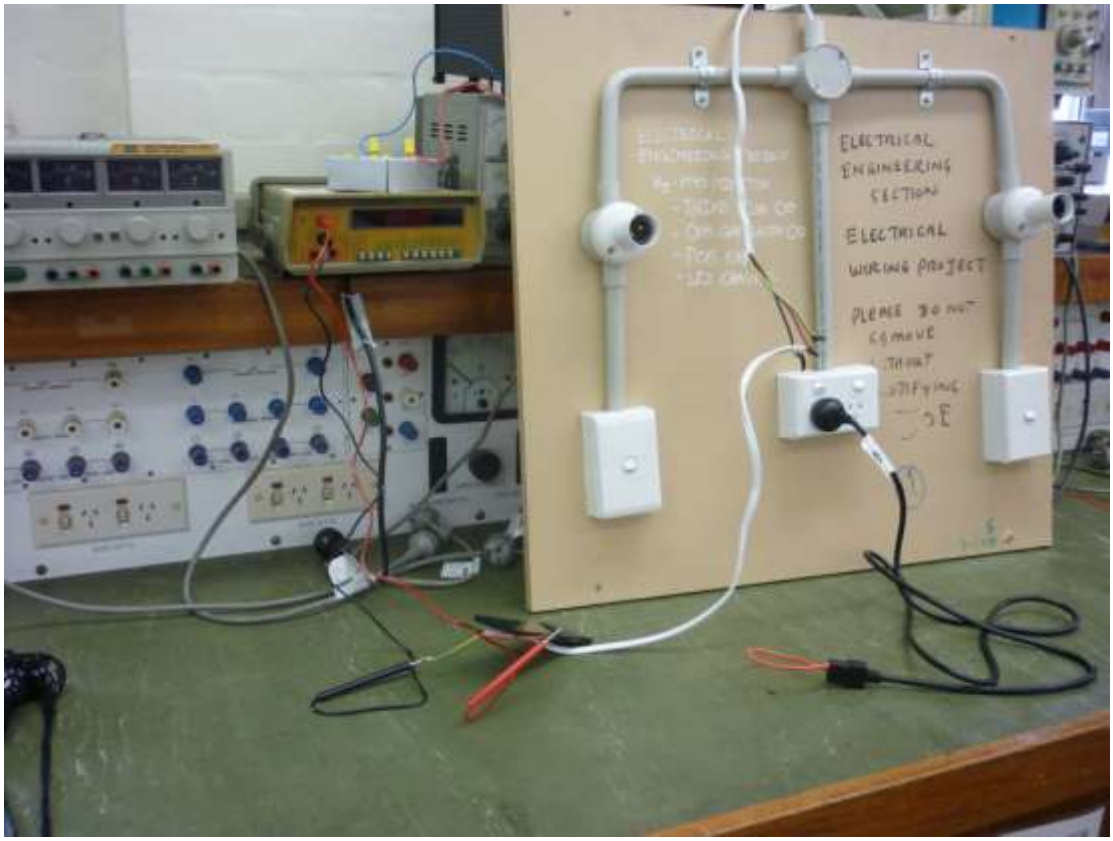

METHOD FOR REDUCING EFFECTIVE LENGTH OF
TEST CIRCUIT
N
A
ALL LAMPS
REMOVED
LAMP
NEUTRAL
DISCONNECTED
A
N
FUSE
CARRIER
REMOVED
E
SWITCH
SWITCH
E
SWITCH ON - 0 Ω
SWITCH OFF - ∞ Ω


OFF
ON
110V A.C
3 PHASE 415/24V SUPPLY


ON
110V.A.C
50~
INDICATOR ON
250V.D.C
ON
6.3V.A.C
240V.G.P.O
240V.G.P.O




TESTING THE POLARITY OF SOCKET OUTLET
A
N
E
A & E BRIDGED
A
N
E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ELECTRICAL
WIRING PROJECT
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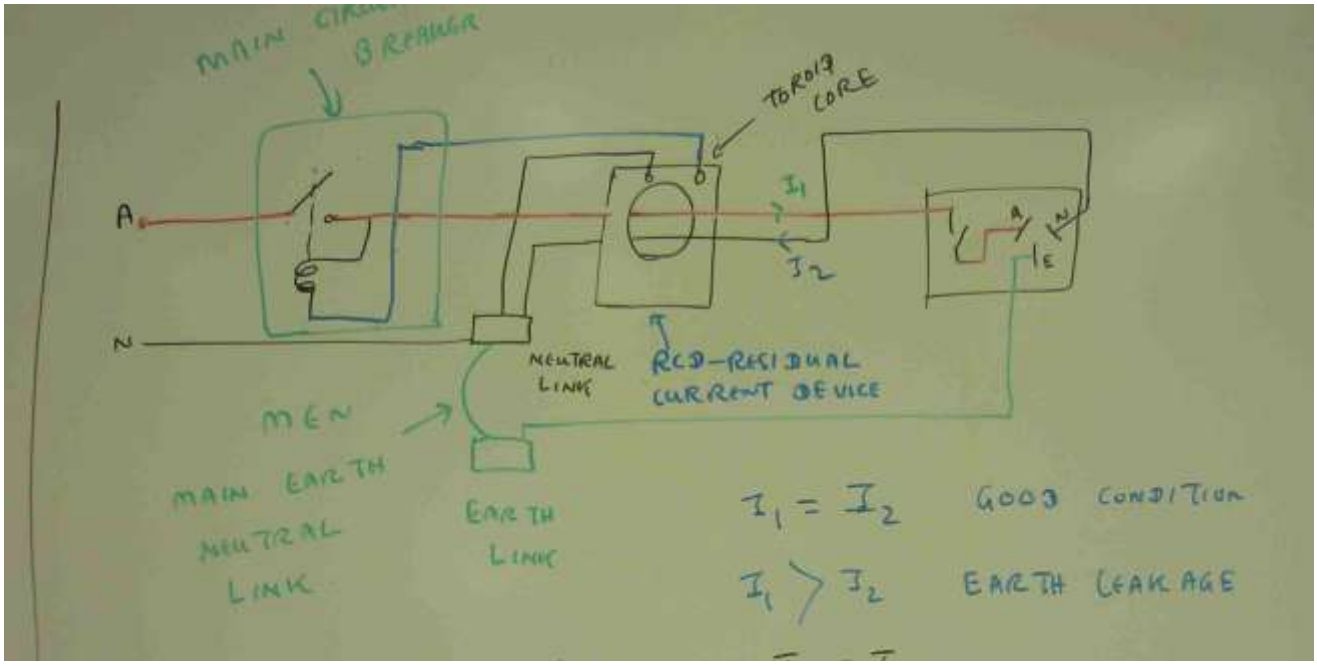
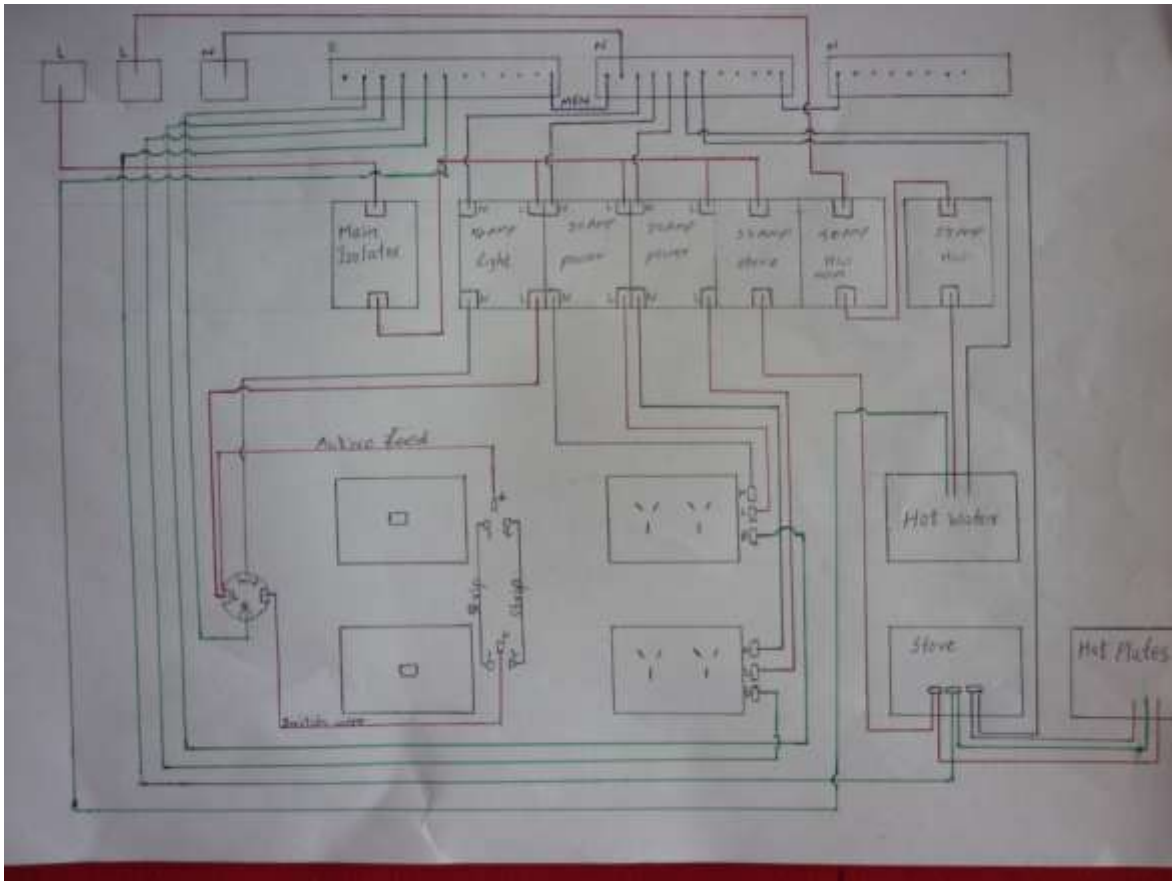
SECTION
ELECTRICAL
WIRING PROJECT
PLEASE DO NOT
REMOVE



Trace the following circuit connection diagram on the switch board.

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PROJECT
PROPERTY OF ULTIMO
ELECTRICAL ENGINEERING
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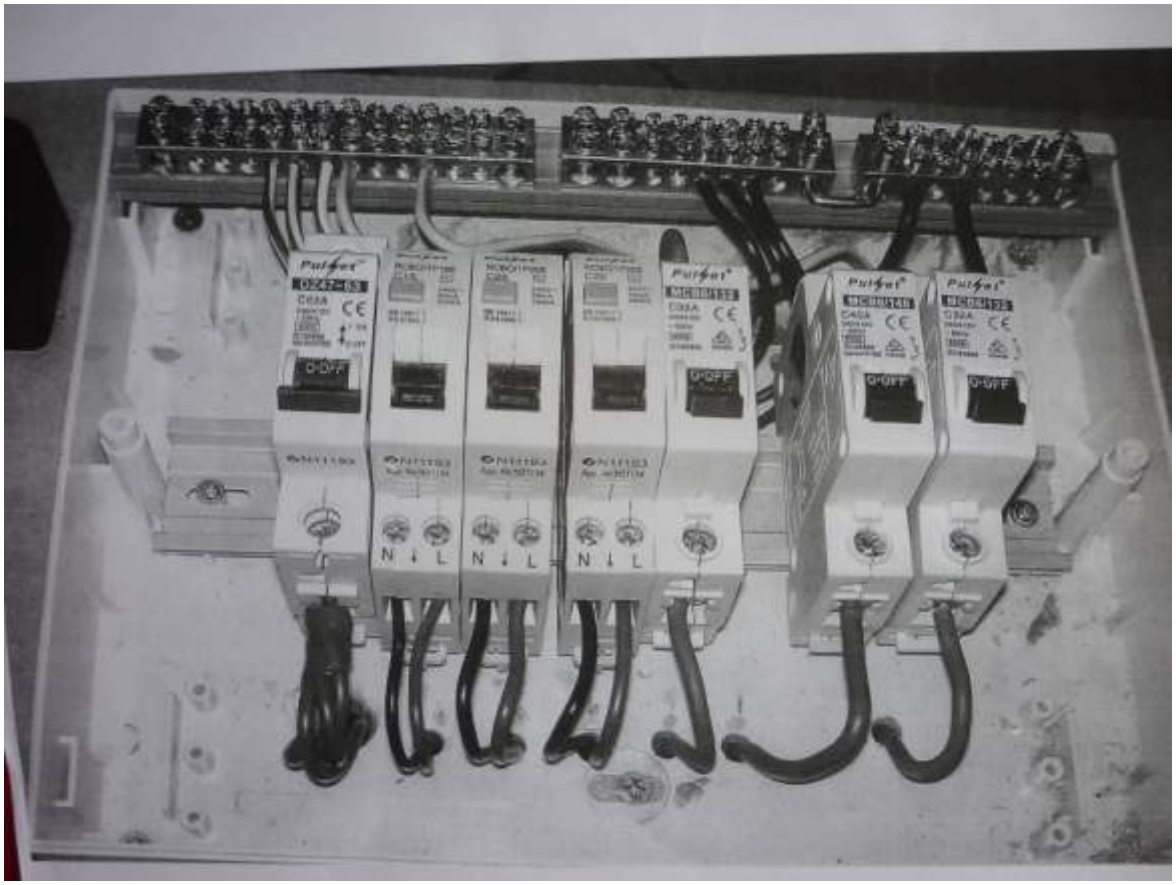
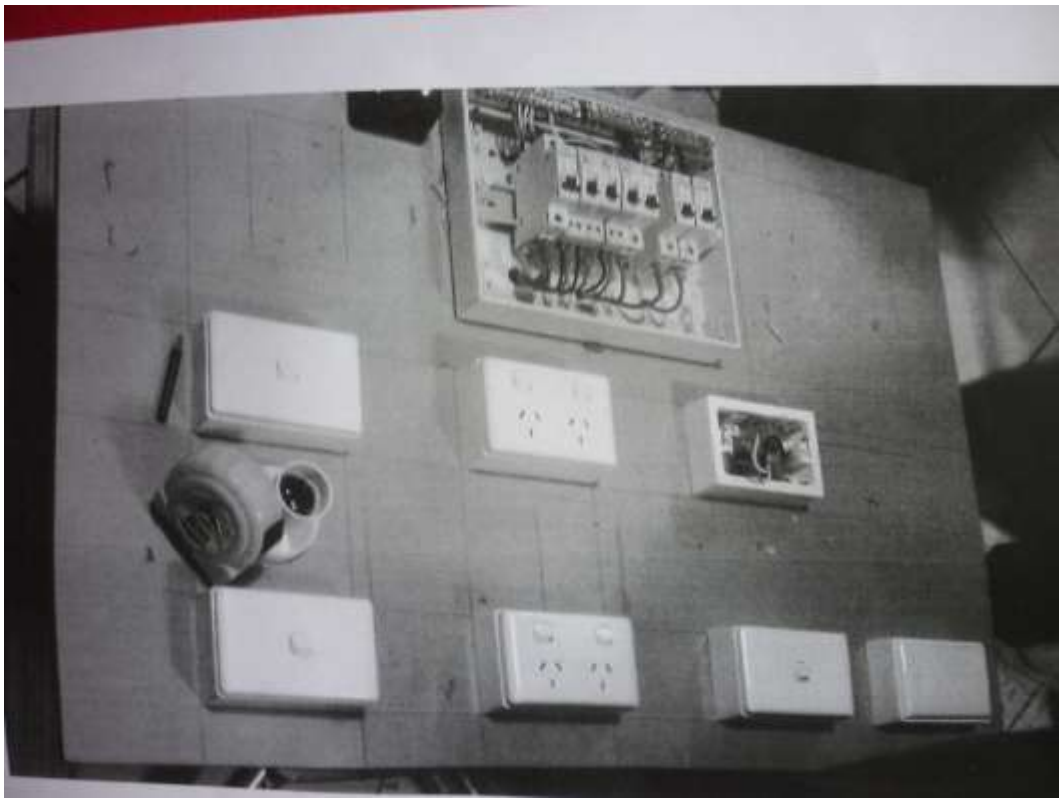
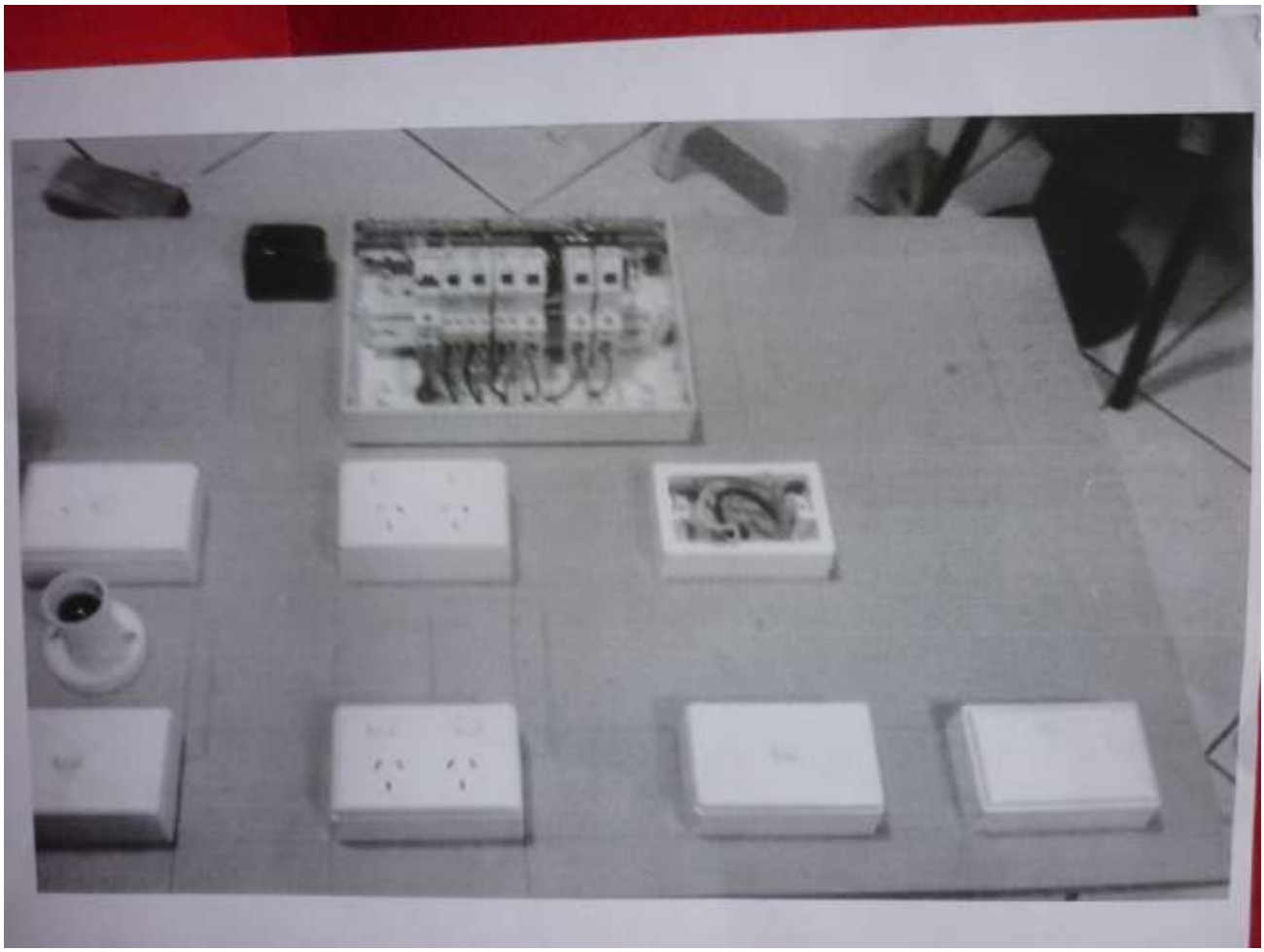
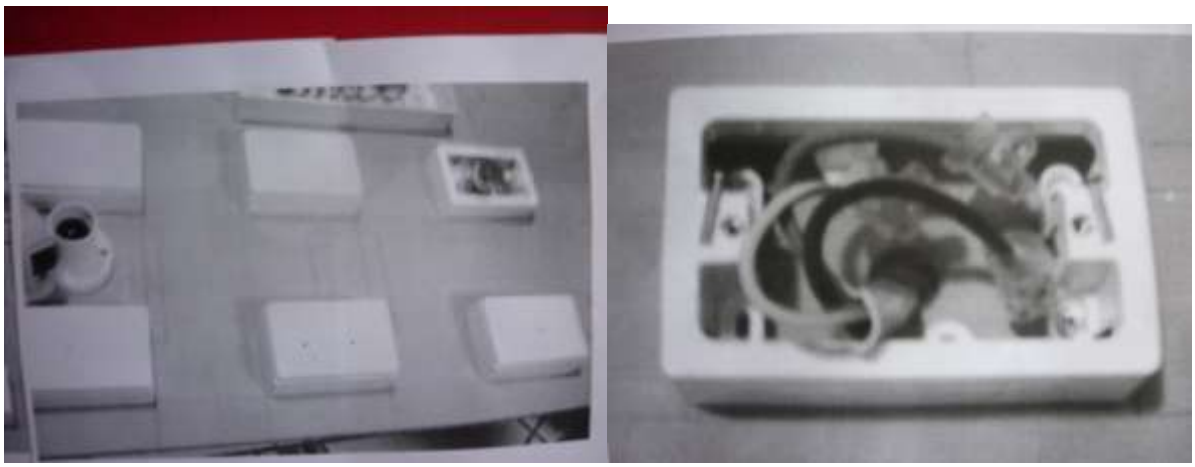

N
L

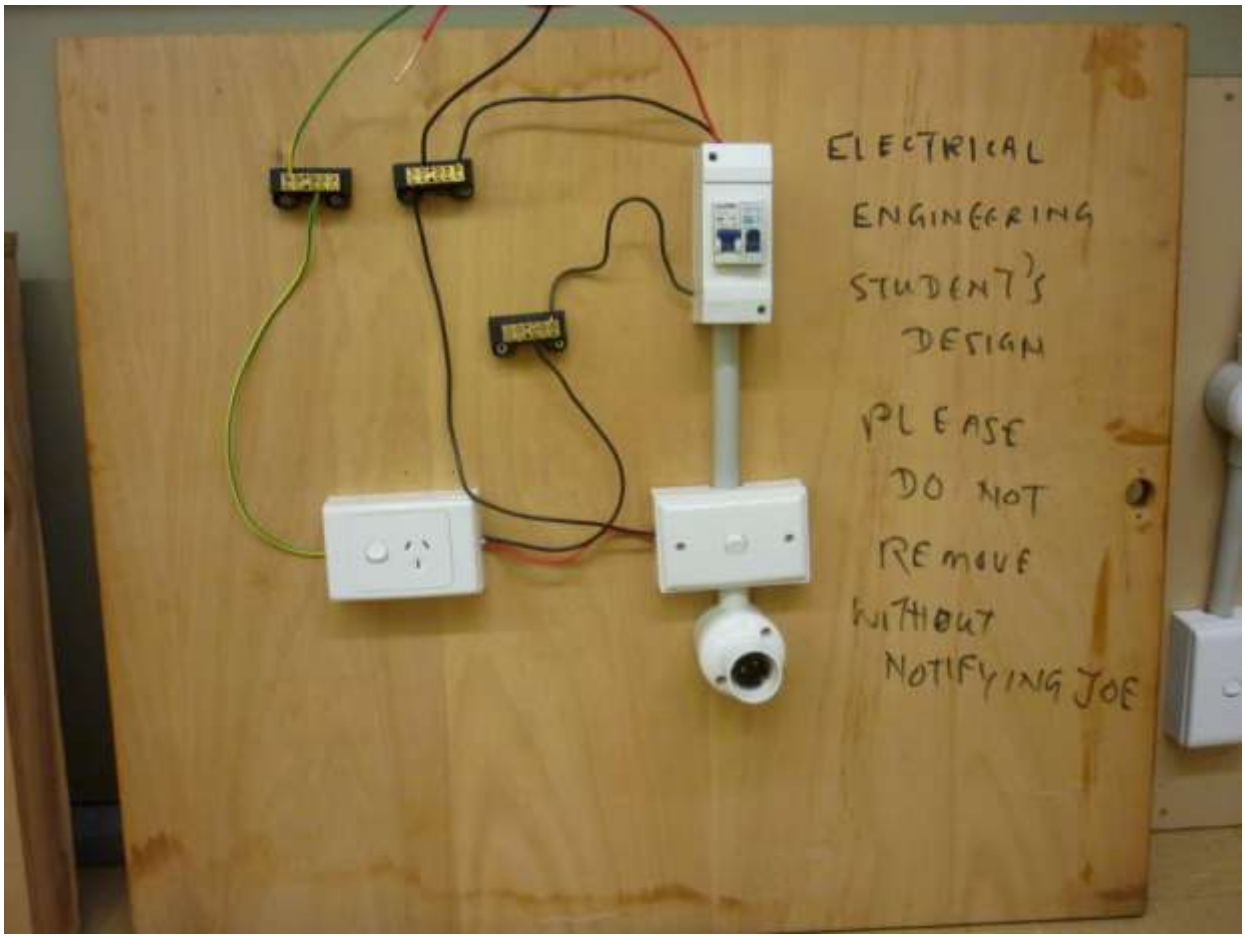


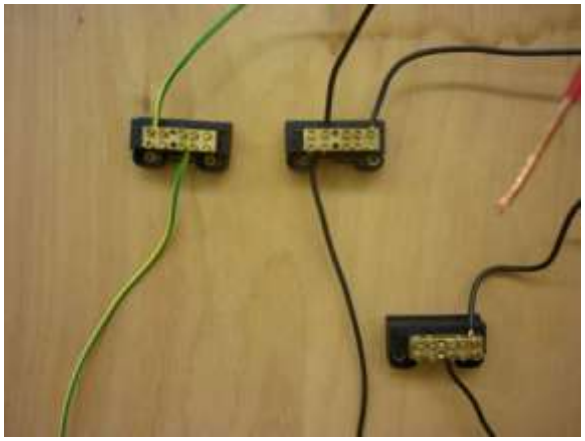


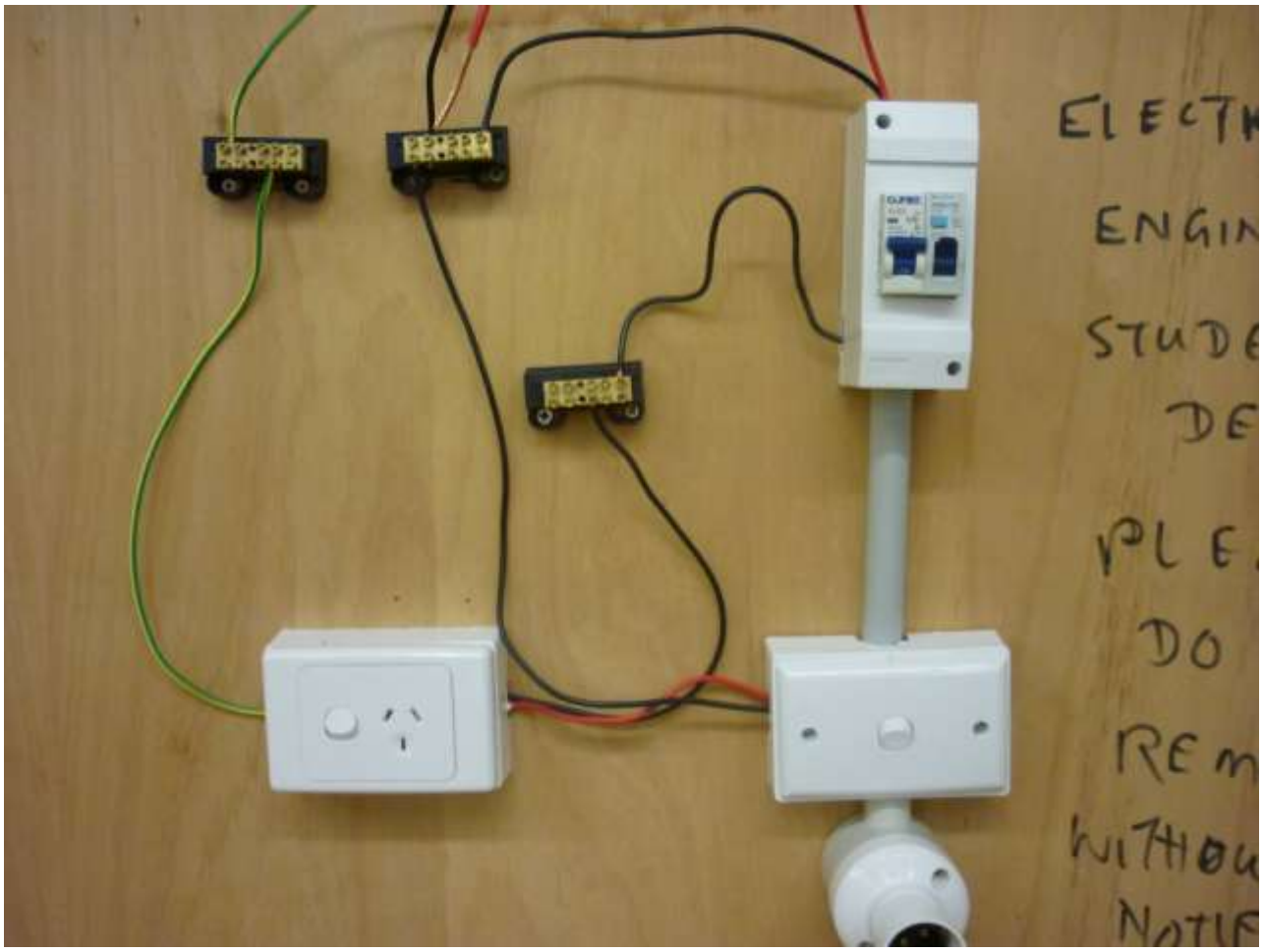


Practical (2) RCD Protected & Unprotected neutral

Test, trace the circuit and sketch the circuit diagram for the given RCD, protected and unprotected neutral



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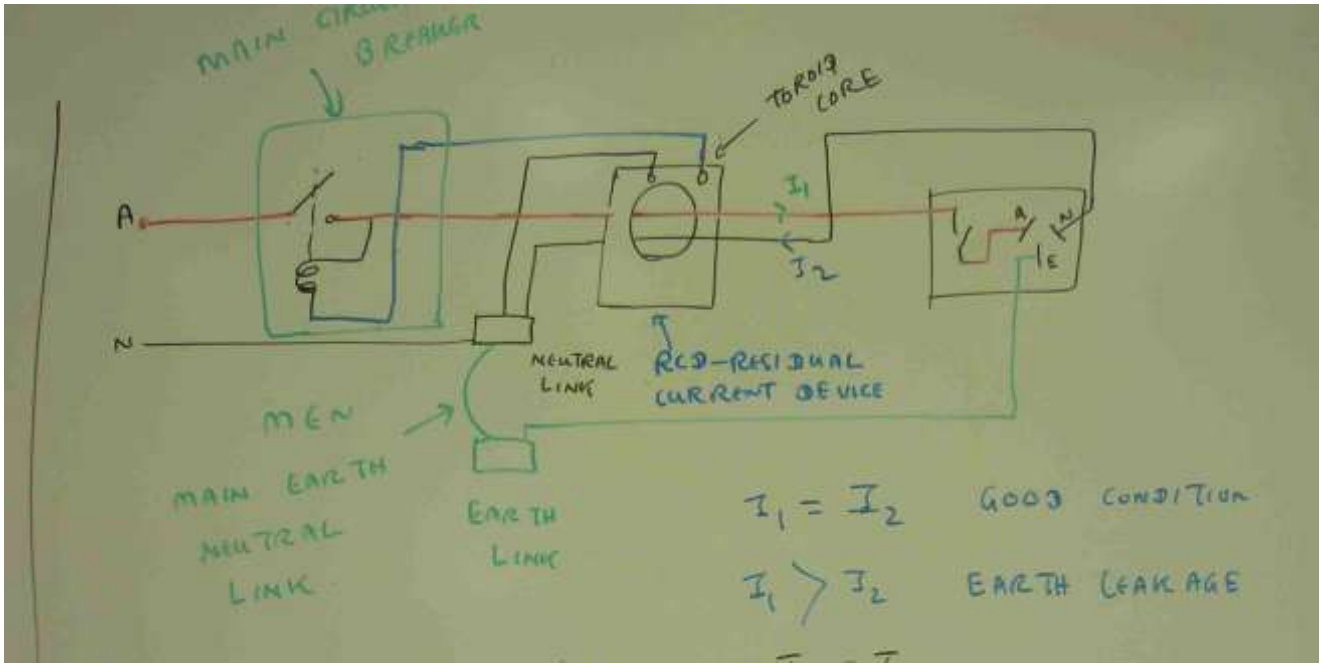
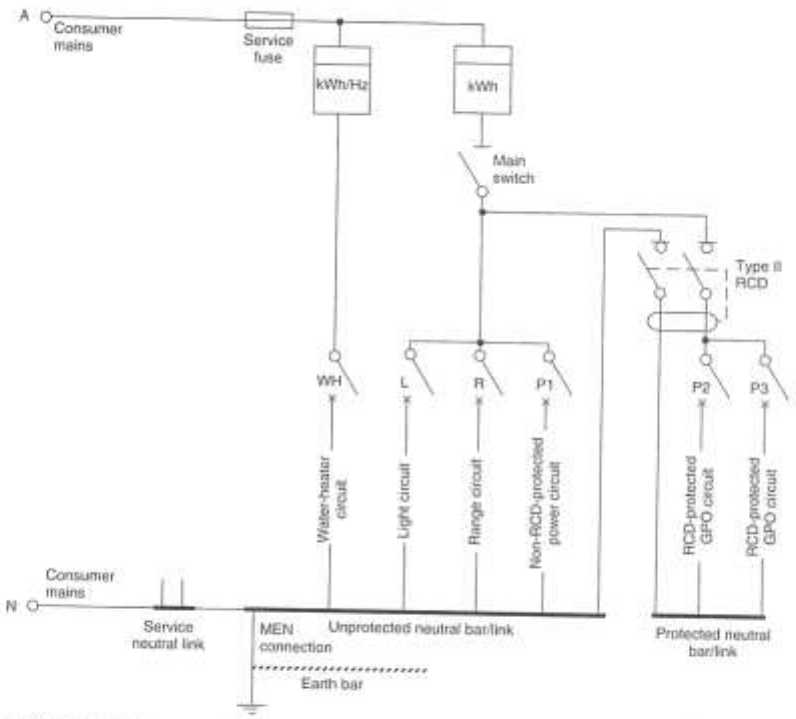
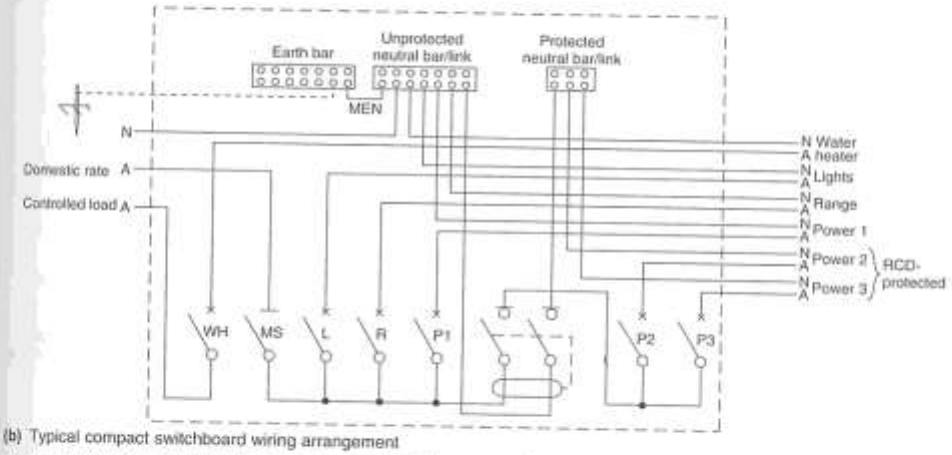

MAIN CIRCUIT BREAKER
TOROID CORE
A
N
I_1
I_2
NEUTRAL LINK
RCD – RESIDUAL CURRENT DEVICE
MEN
MAIN EARTH NEUTRAL LINK
EARTH LINK
$I_1 = I_2$ GOOD CONDITION
$I_1 > I_2$ EARTH LEAKAGE



(a) Typical installation circuit arrangement



(b) Typical compact switchboard wiring arrangement

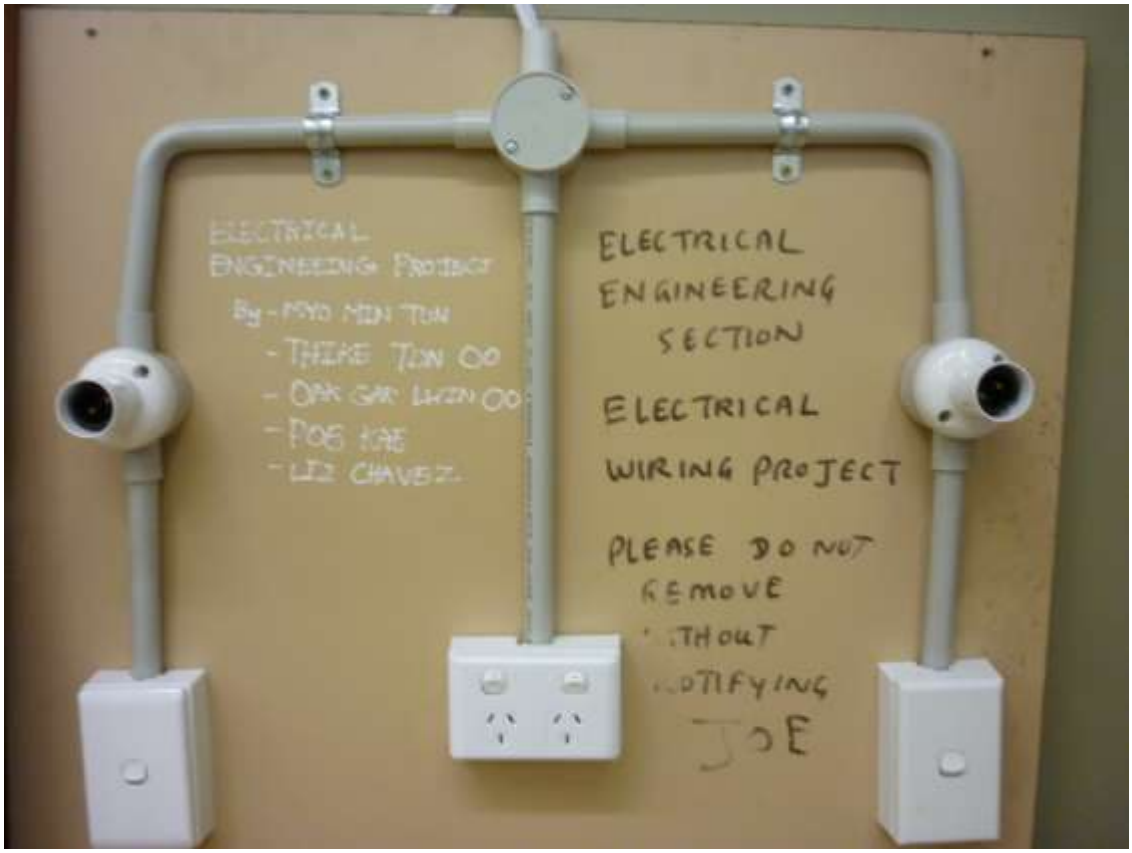
Fig. 14.14 *Distribution arrangement in a single domestic dwelling for protection of two power circuits using one 2-pole RCD. Note the separate neutral bars/links for RCD-protected and non-protected portions of the installation*

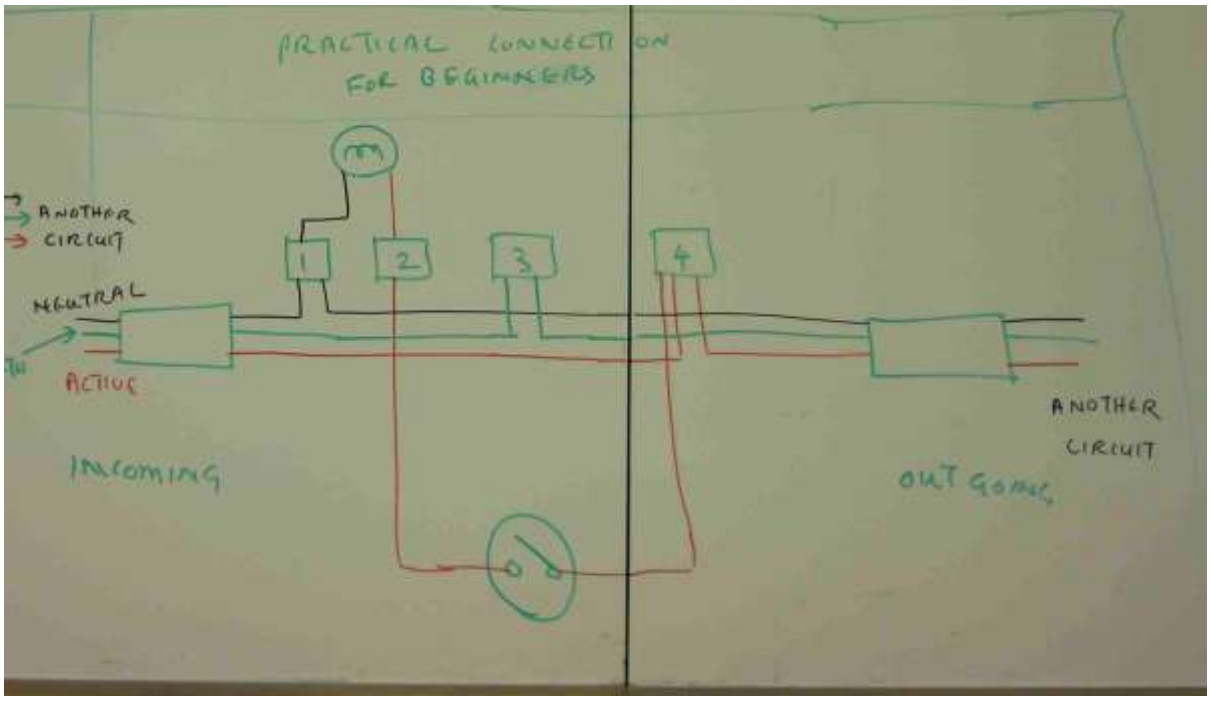
tected by a type II 30 mA device. The protection should be separate from any other circuit to avoid faults plunging the whole installation into darkness.

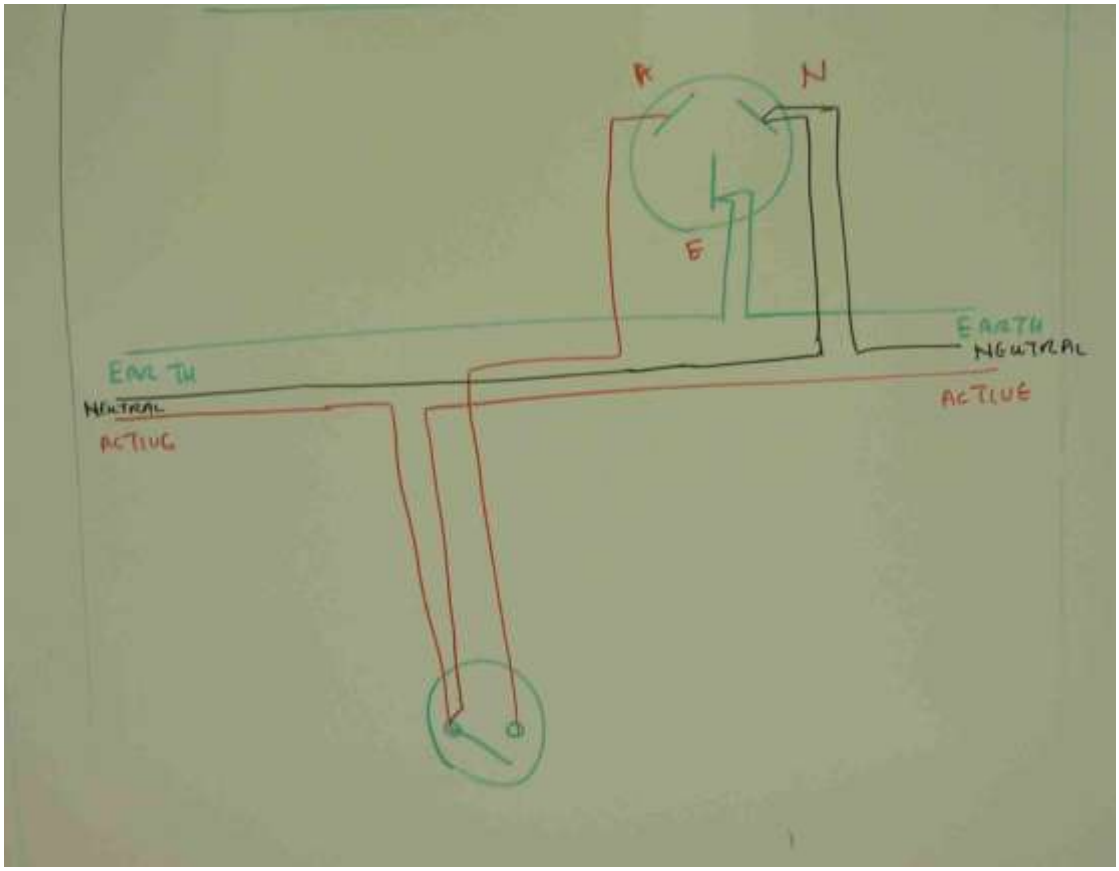
Circuits supplying equipment in spa or pool areas are usually protected adequately by type II 30 mA devices, as long as heating elements are not involved. Figure 17.4 in Chapter 17 shows a switchboard equipped to provide RCD type IV as the main switch, RCD/MCB type II for pool area and RCD type II for two power circuits. The switchboard comes fitted with an earth bar and an unprotected neutral bar with terminals for the main earth, main neutral and MEN

Practical (3) Light + Socket outlet Wiring

Dismantle & reassemble the following light & socket outlet wiring system.

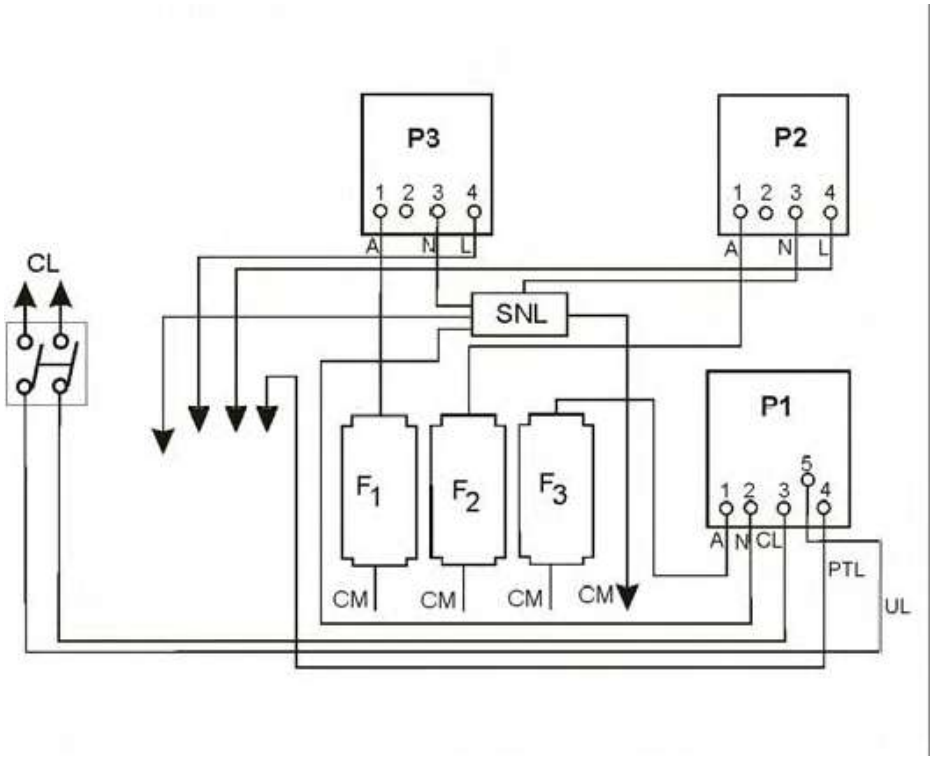


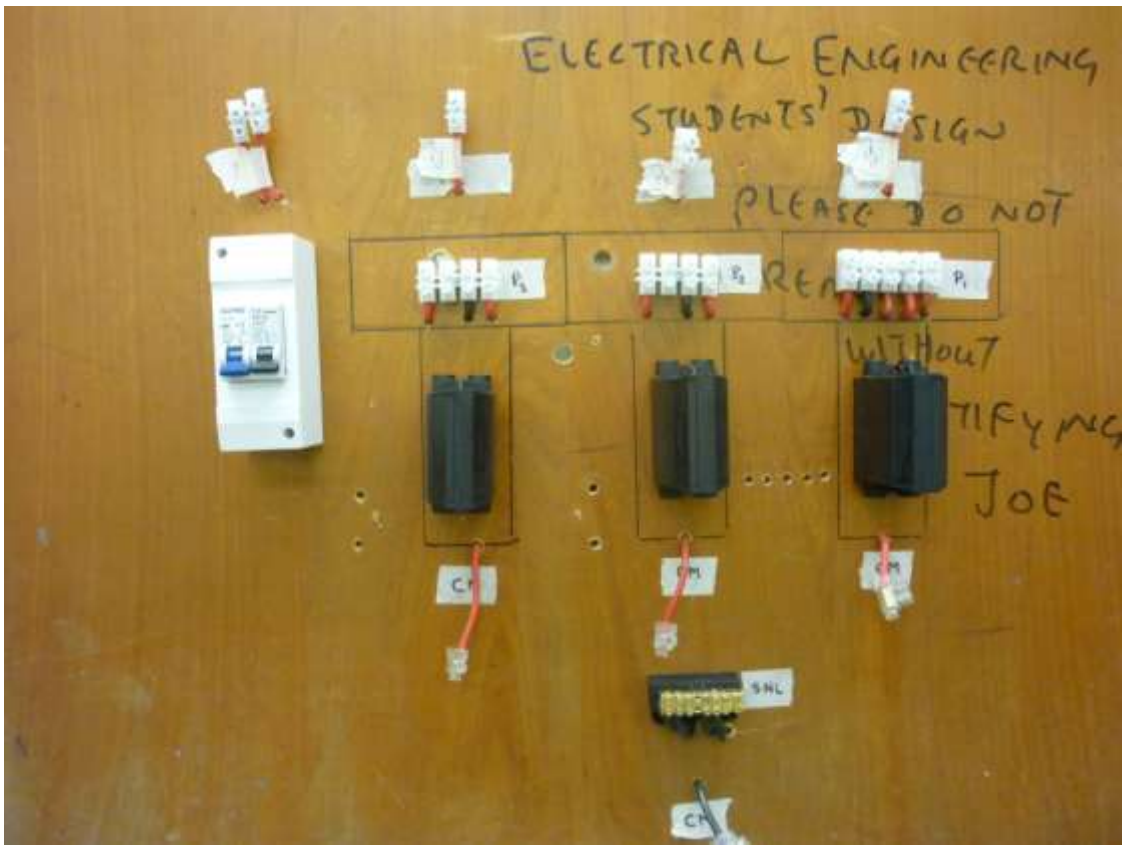




Practical (4) Power supply metering system

Trace the given metering control system on given assemble board.

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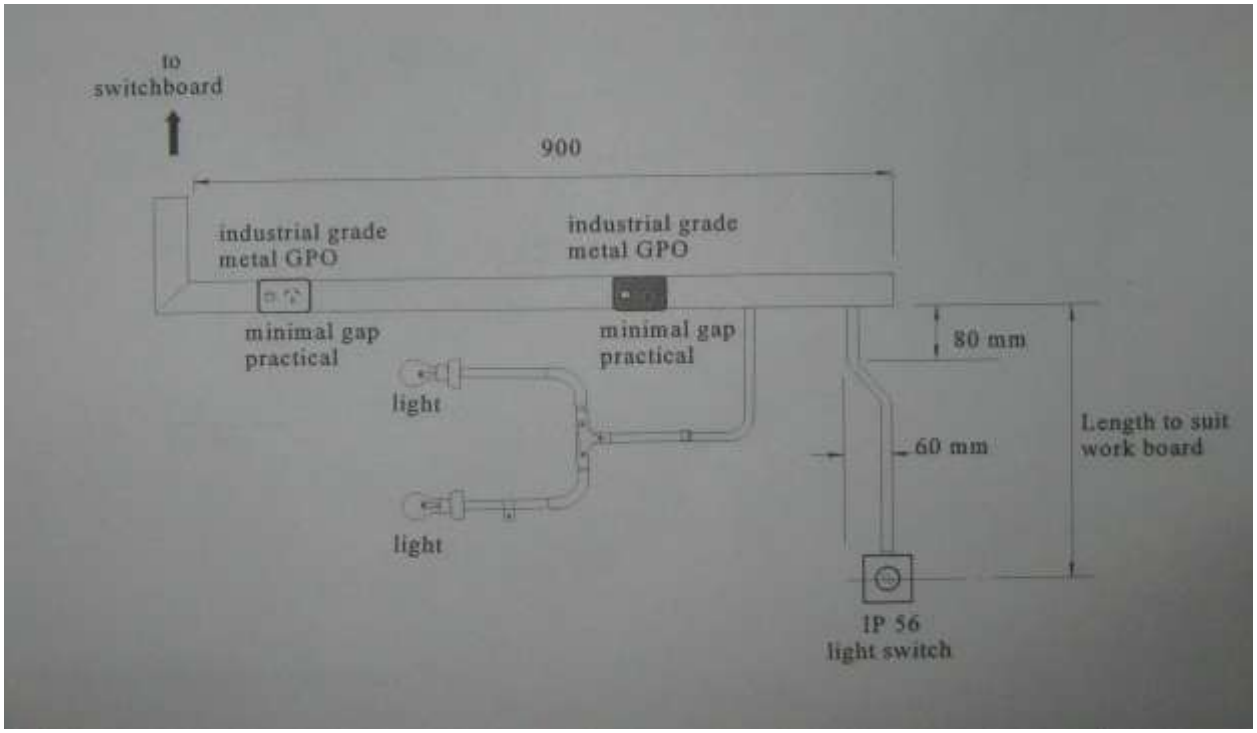
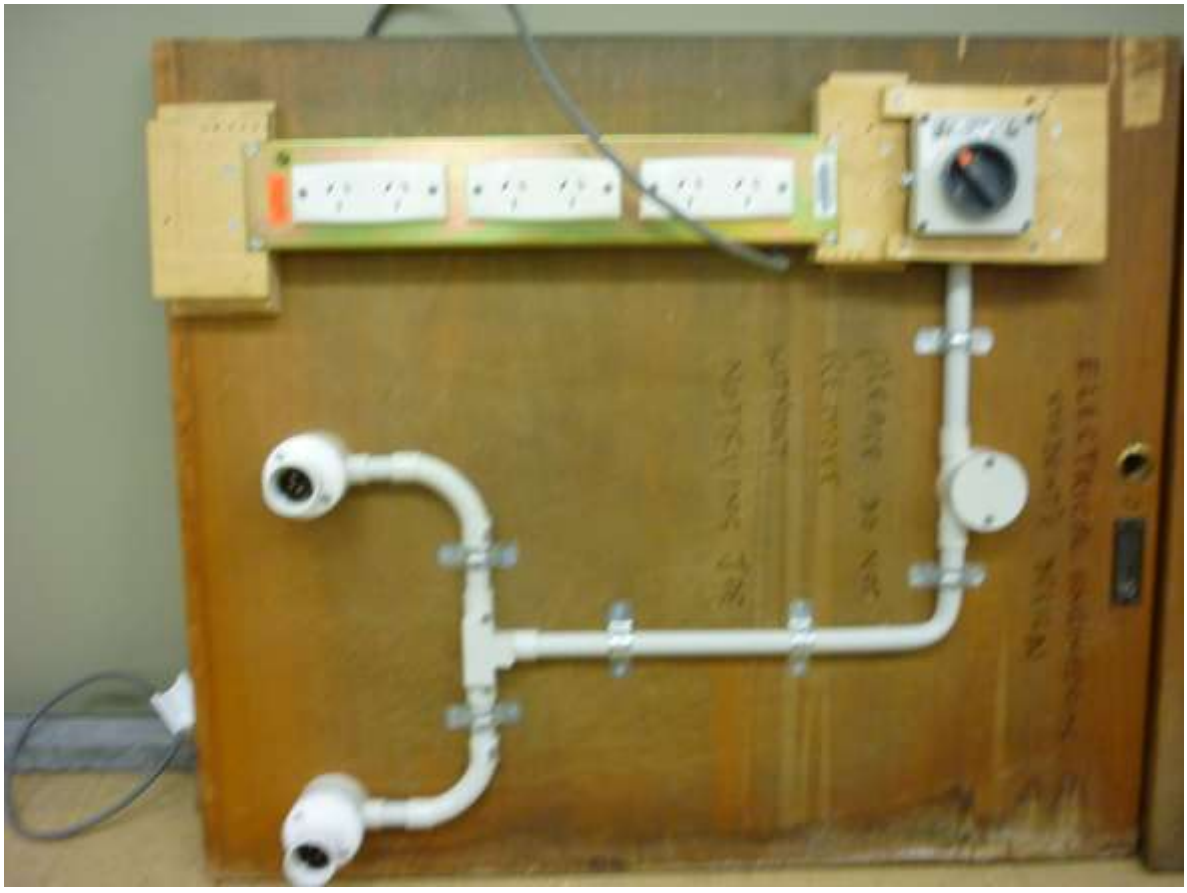
Practical (5) Modification of design diagram to do the actual assembly

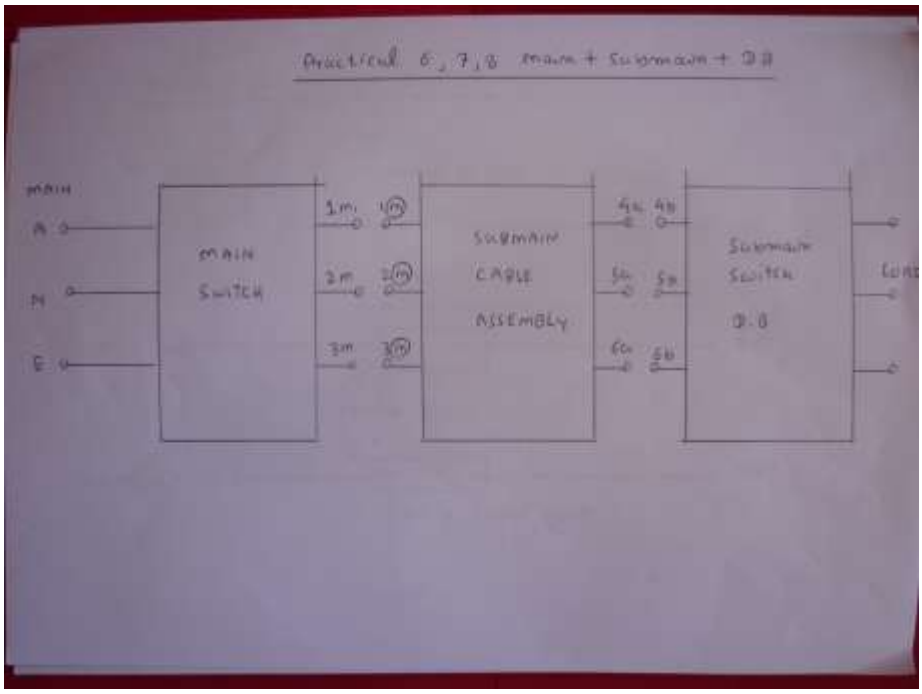
Trace the following wiring assembly on the given wiring board. The given drawing is just an outline. The actual assembly is different from it. Sketch the actual assembly diagram & circuit diagram.





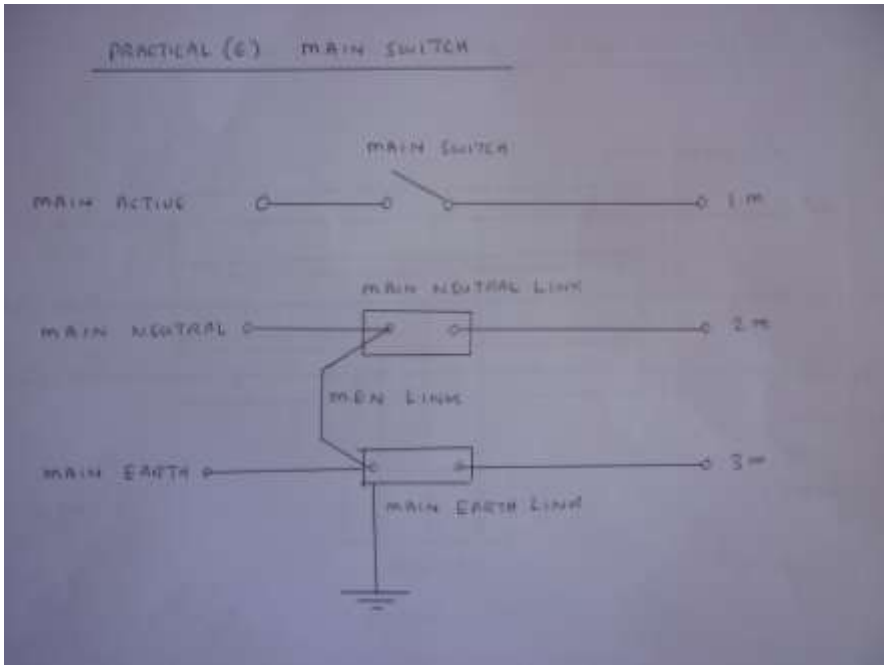
Practical (6,7,8) Main, Sub-main & Distribution Board Wiring

Wire the main, sub-main and distribution board wiring by using the following circuit diagrams (OR) Trace the circuit & draw the circuit diagram.



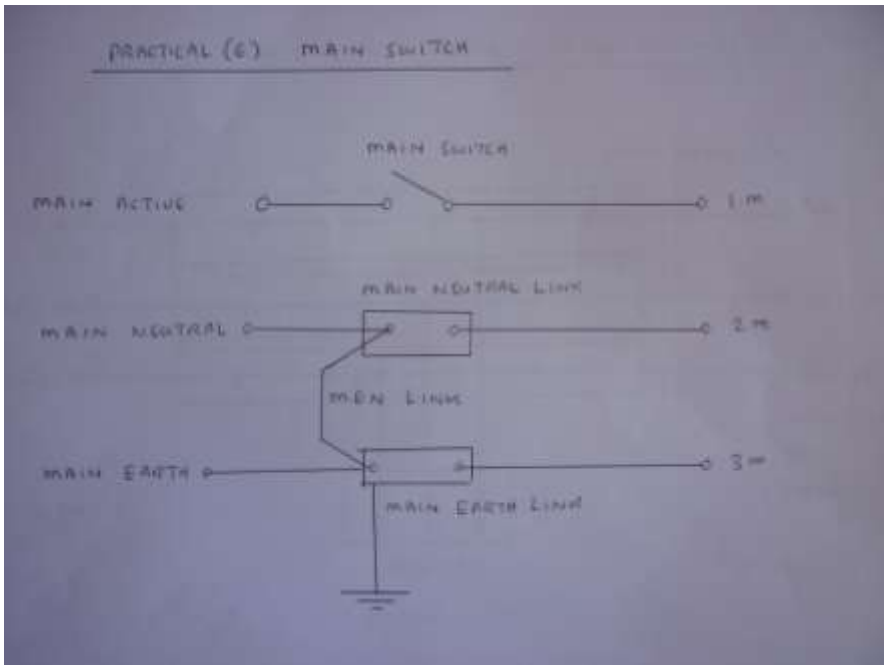
Practical (6) Main

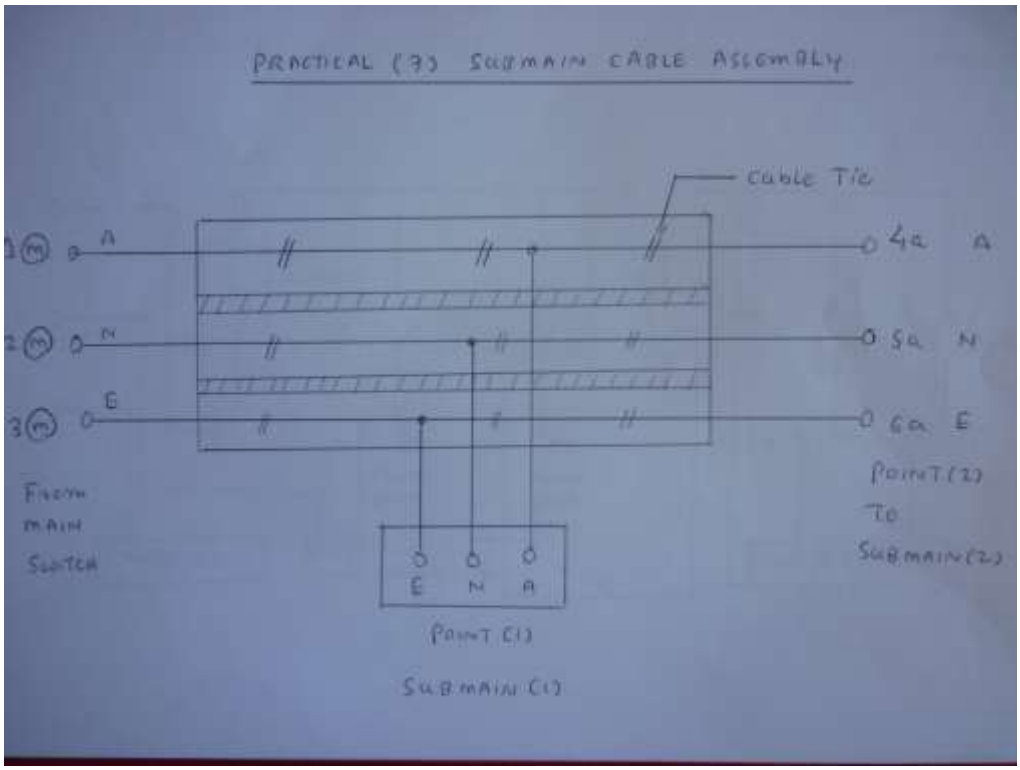
Wire the main board wiring by using the following circuit diagrams (OR) Trace the circuit & draw the circuit diagram.



Practical (7) Sub-main Board Wiring

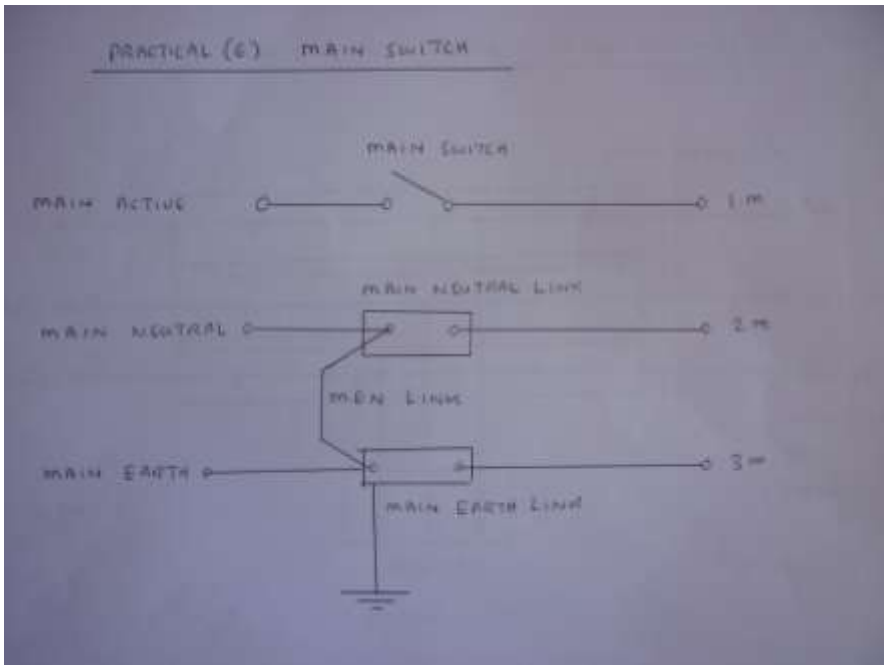
Wire the main, sub-main and distribution board wiring by using the following circuit diagrams (OR) Trace the circuit & draw the circuit diagram.

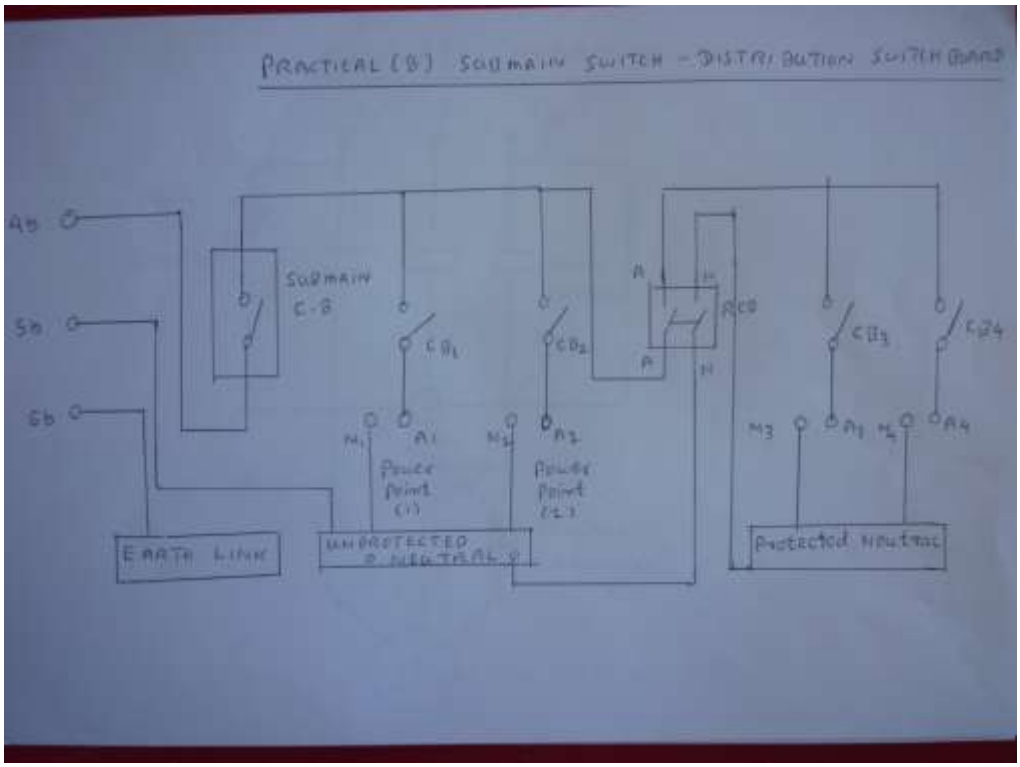


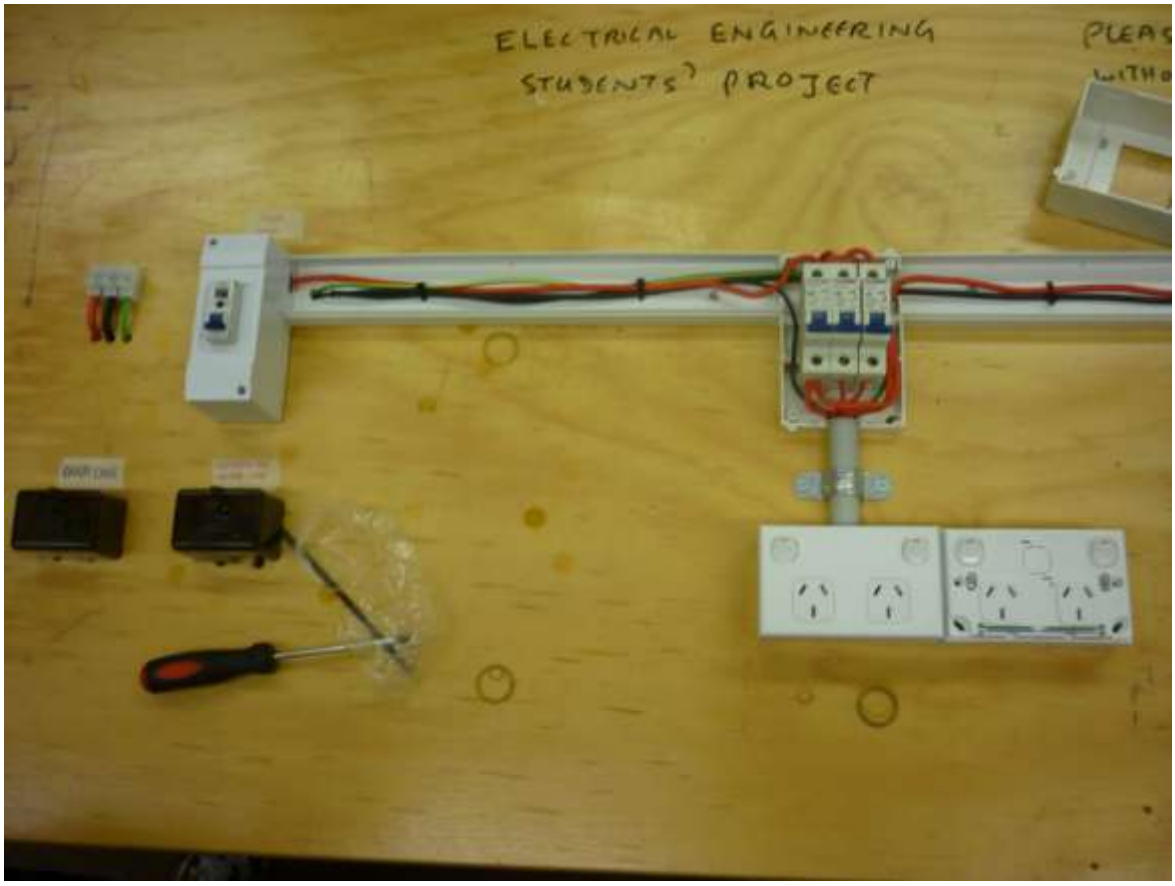


Practical (8) Distribution Board Wiring

Wire the distribution board wiring by using the following circuit diagrams (OR) Trace the circuit & draw the circuit diagram.



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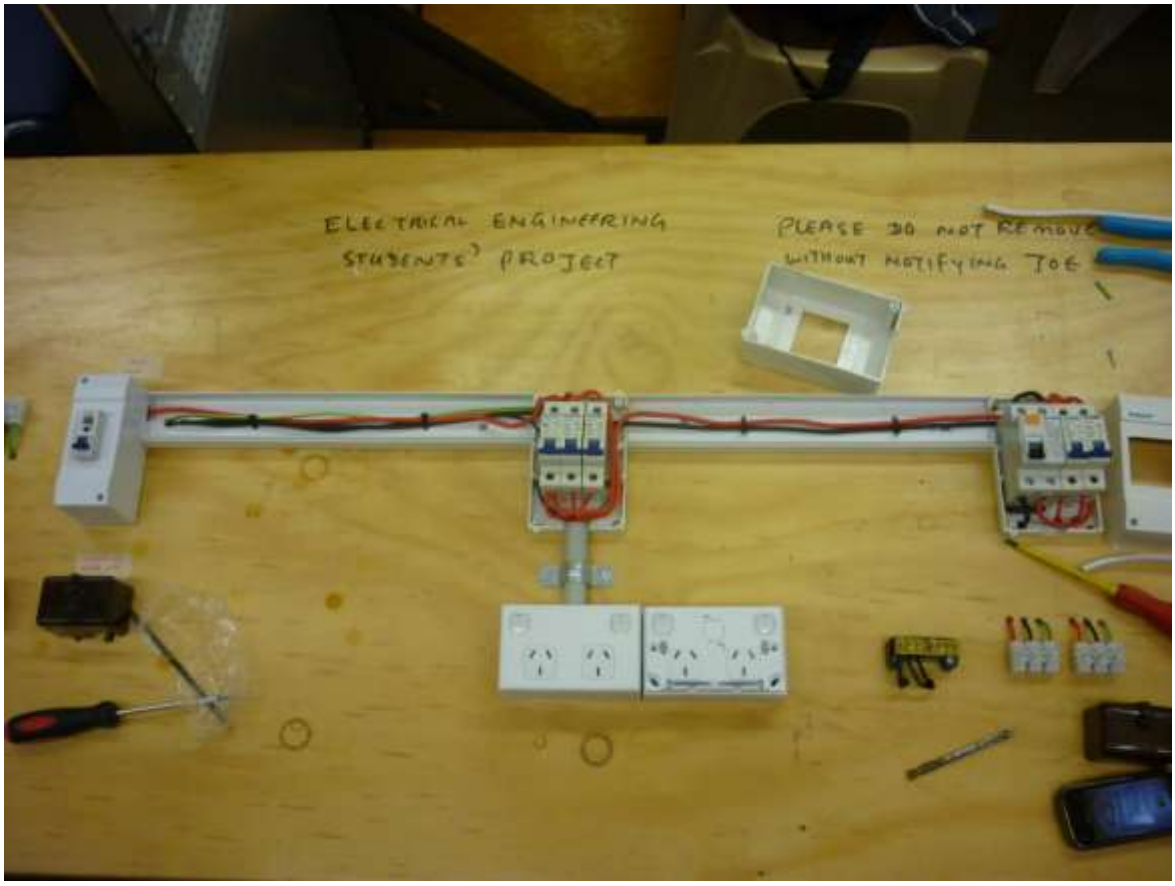
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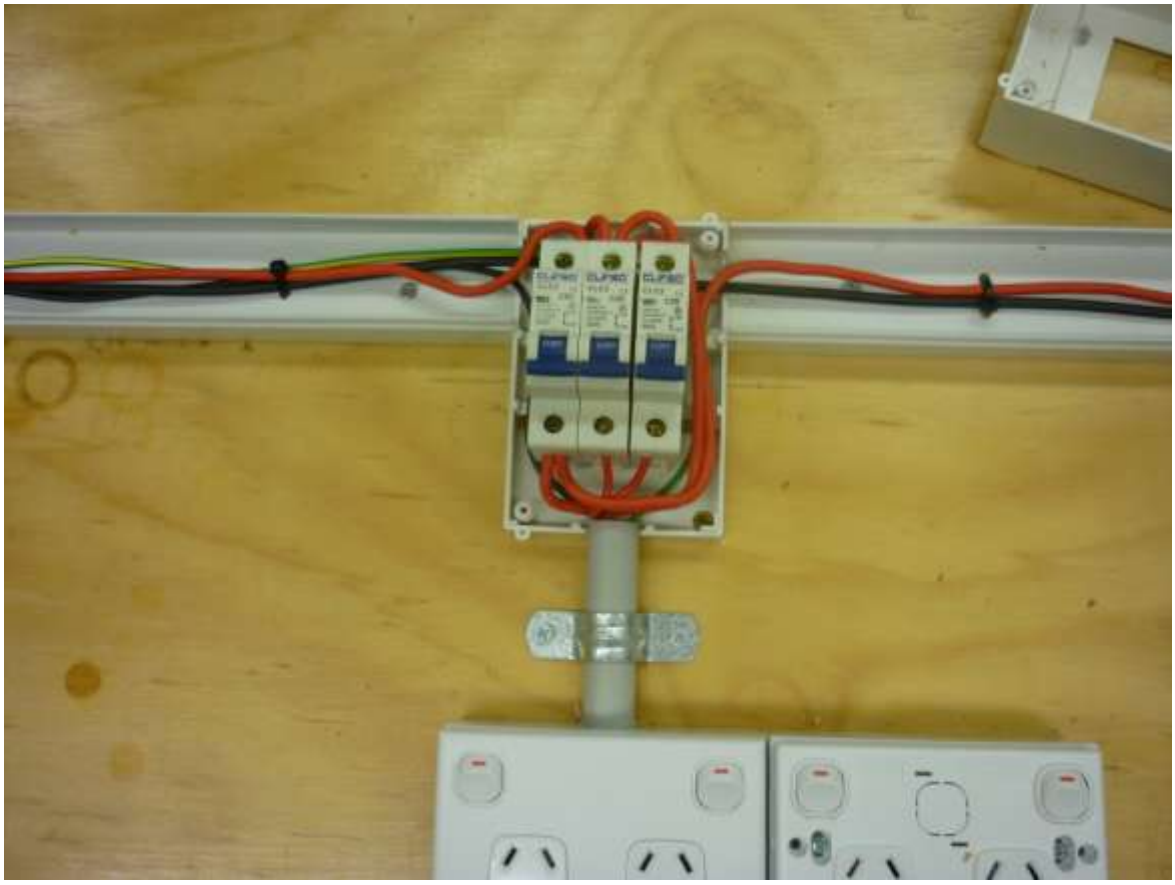
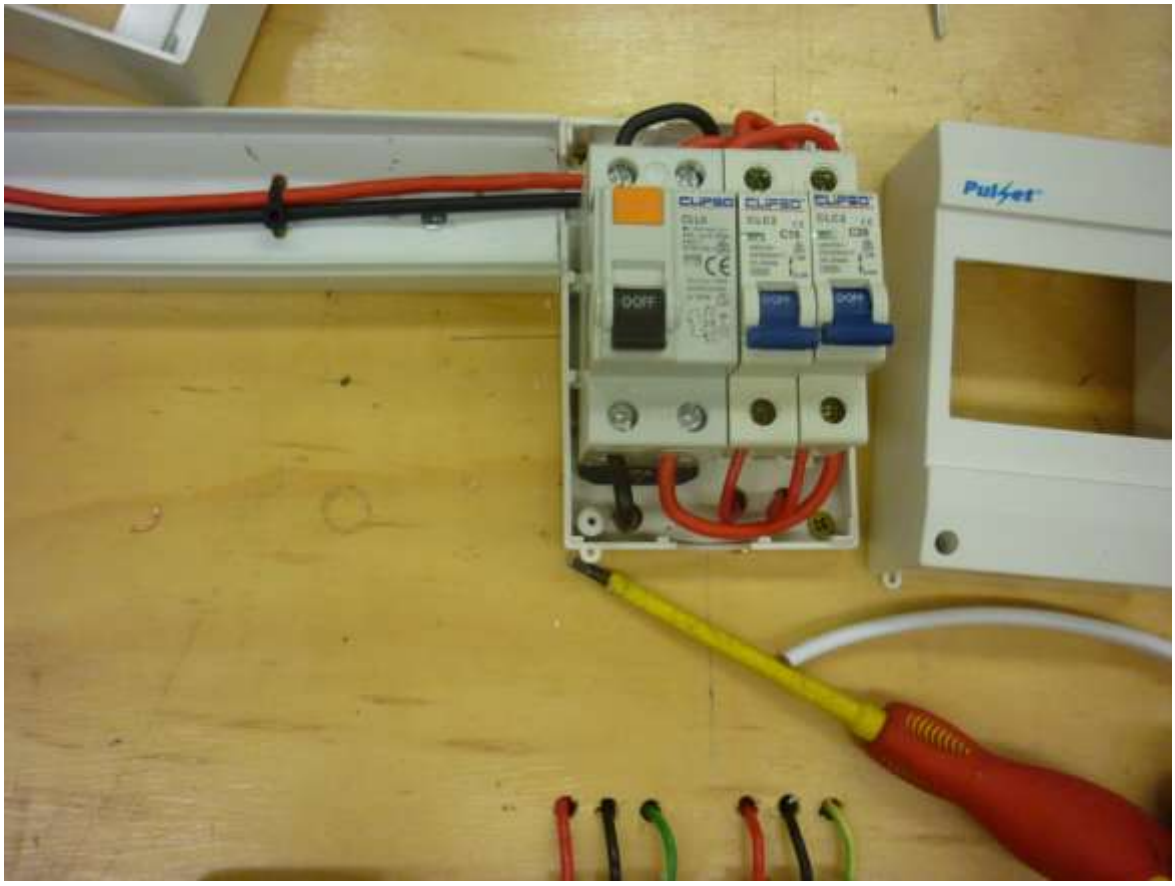
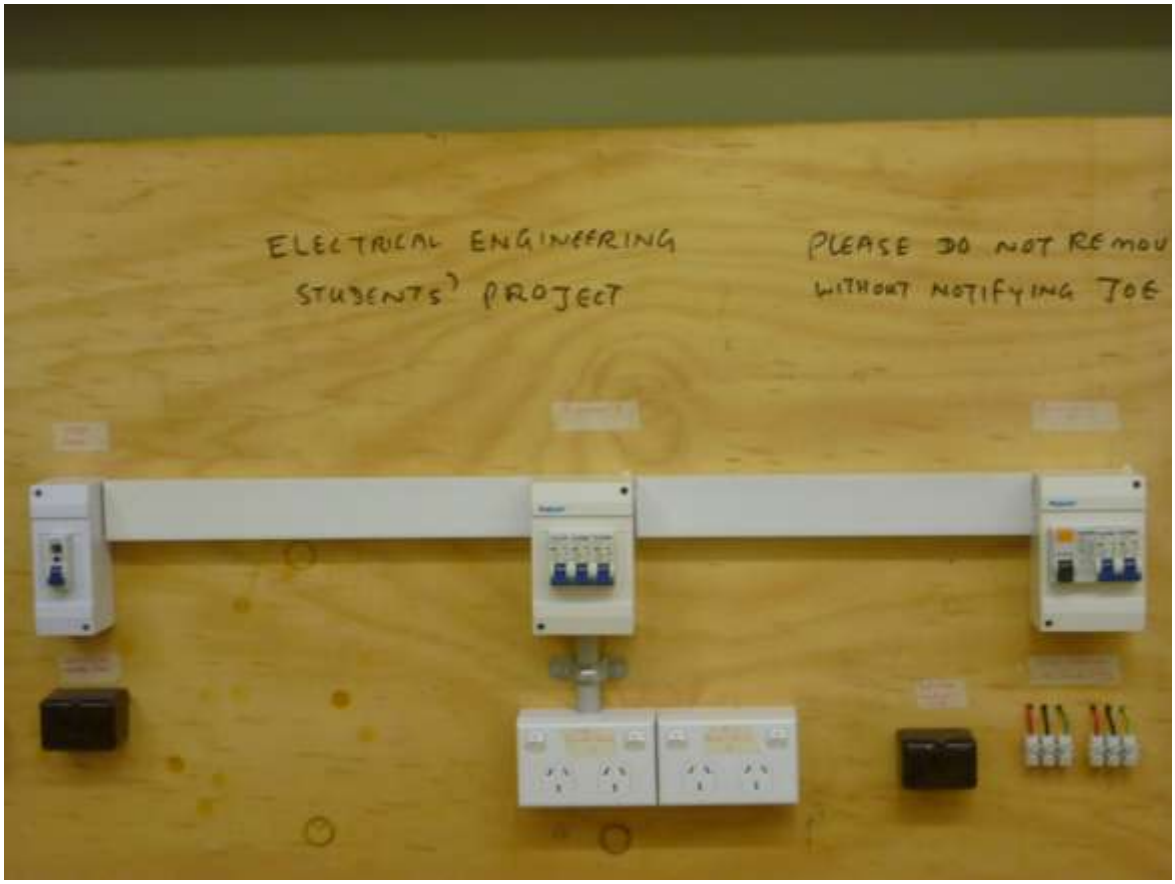



Pulsar
OFF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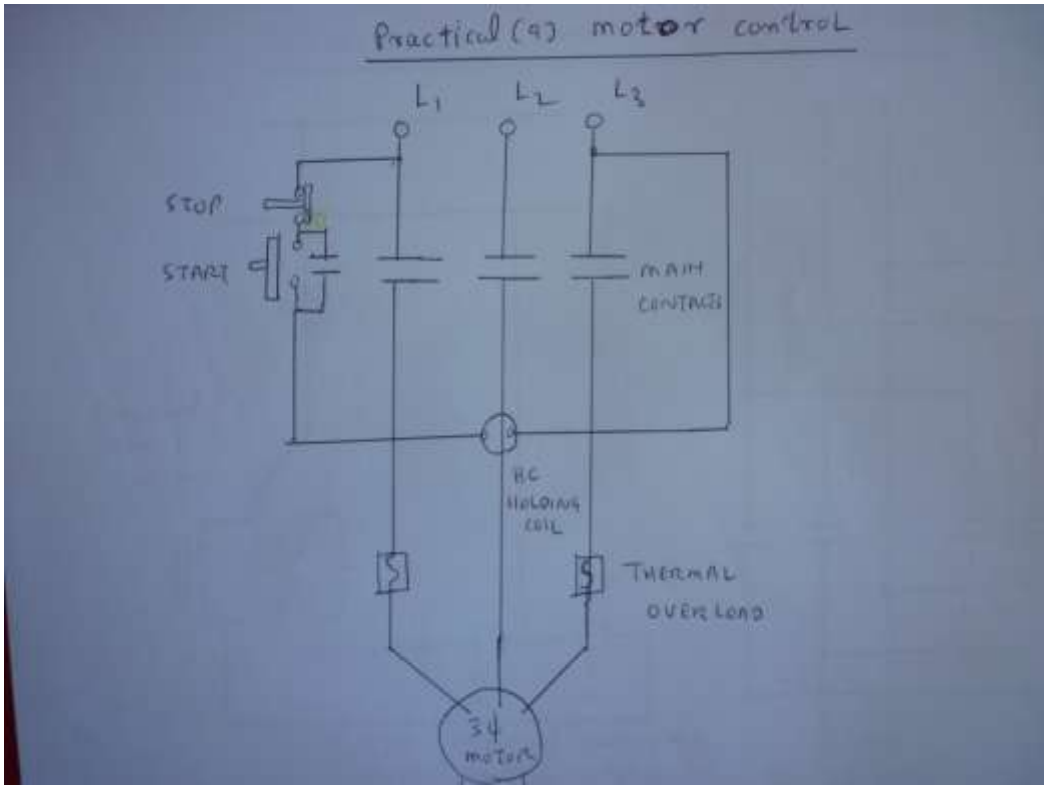
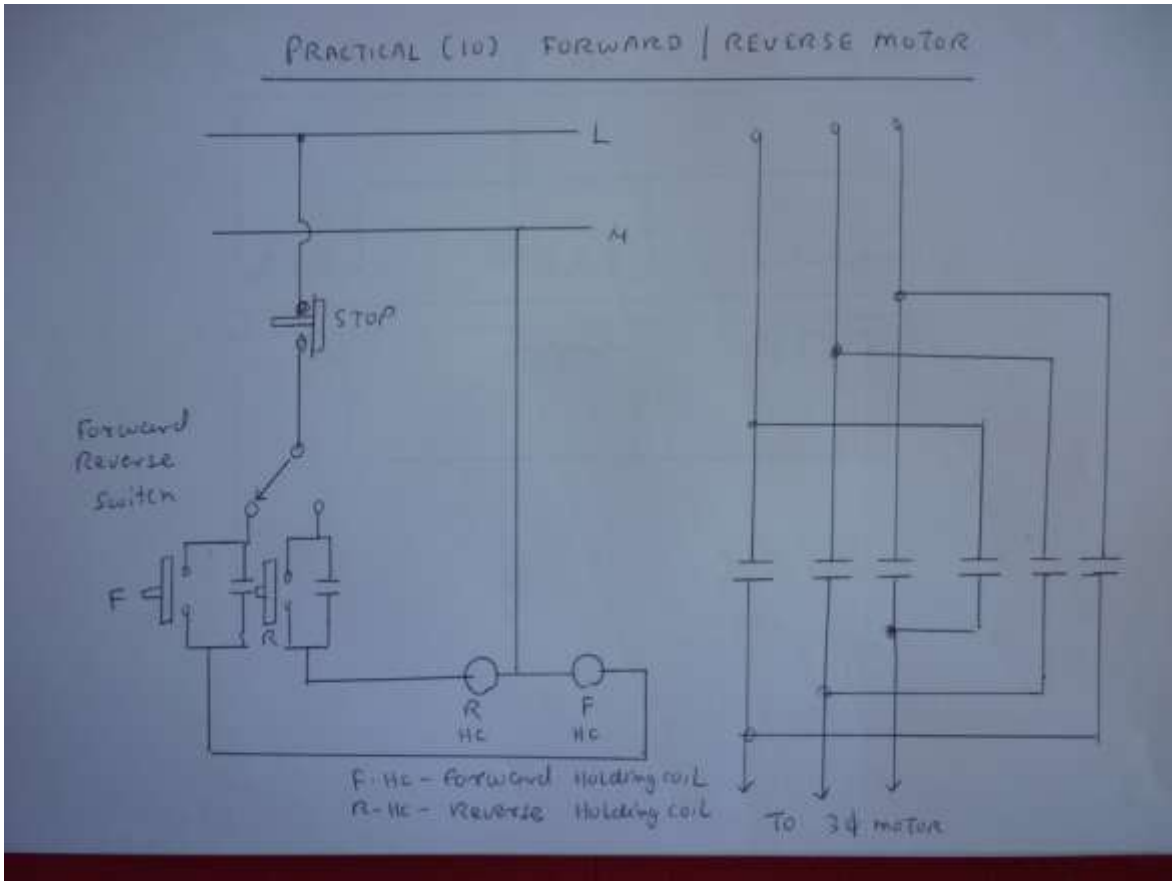
Practical (9) Motor Control

Connect the following motor control Direct Online Starter by using the given diagram.

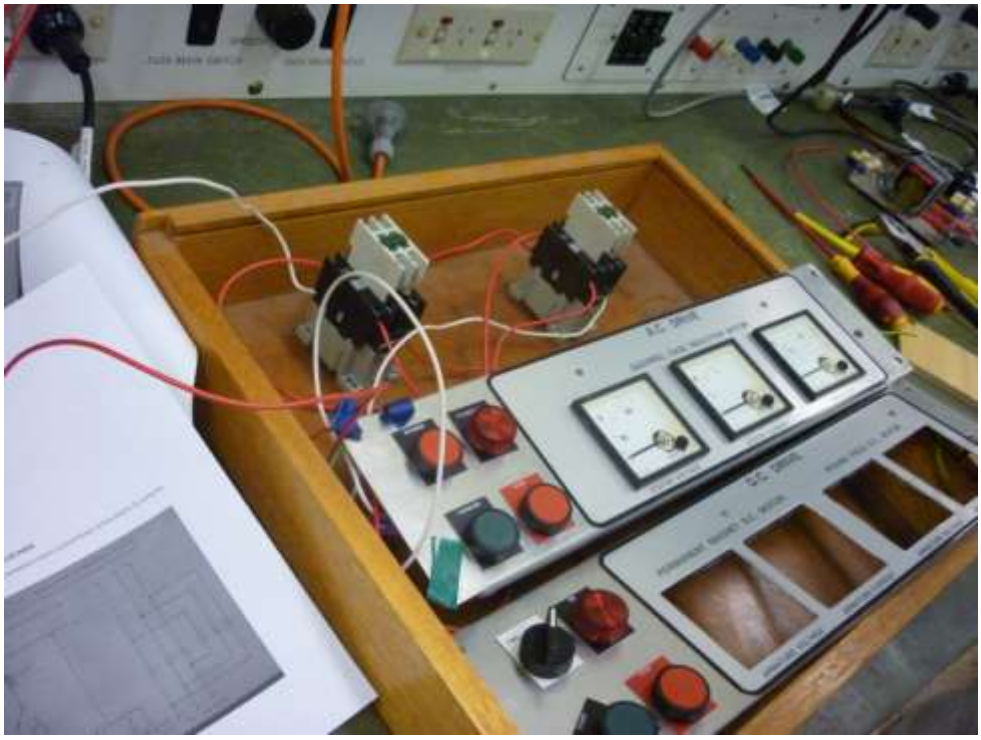


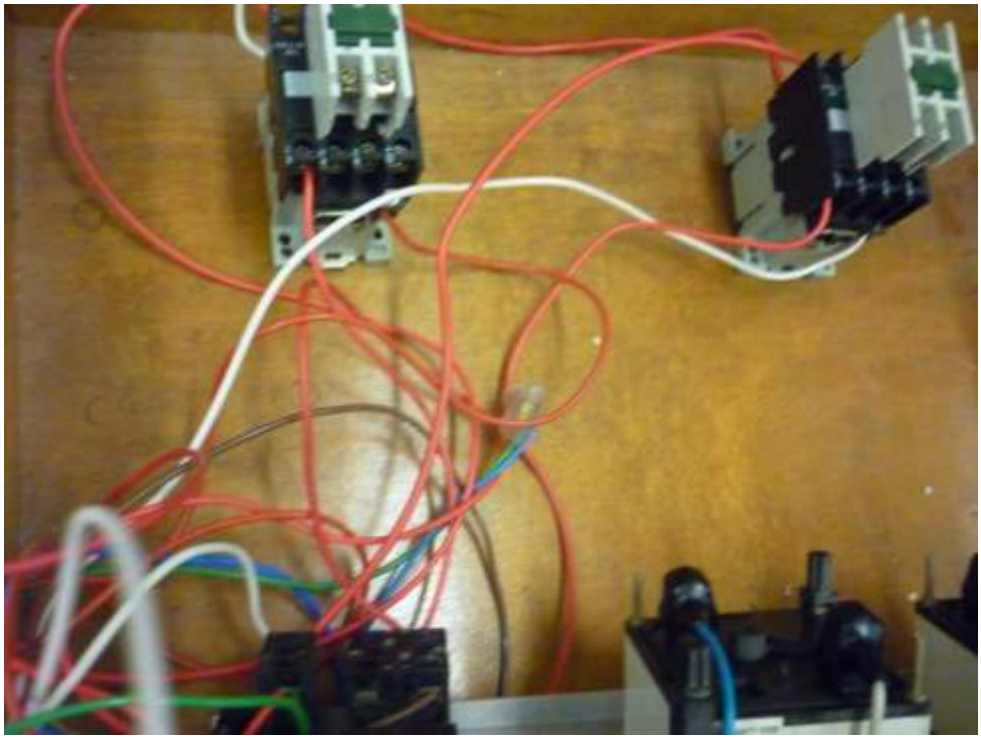
Practical (10) Forward Reverse Connection of motor

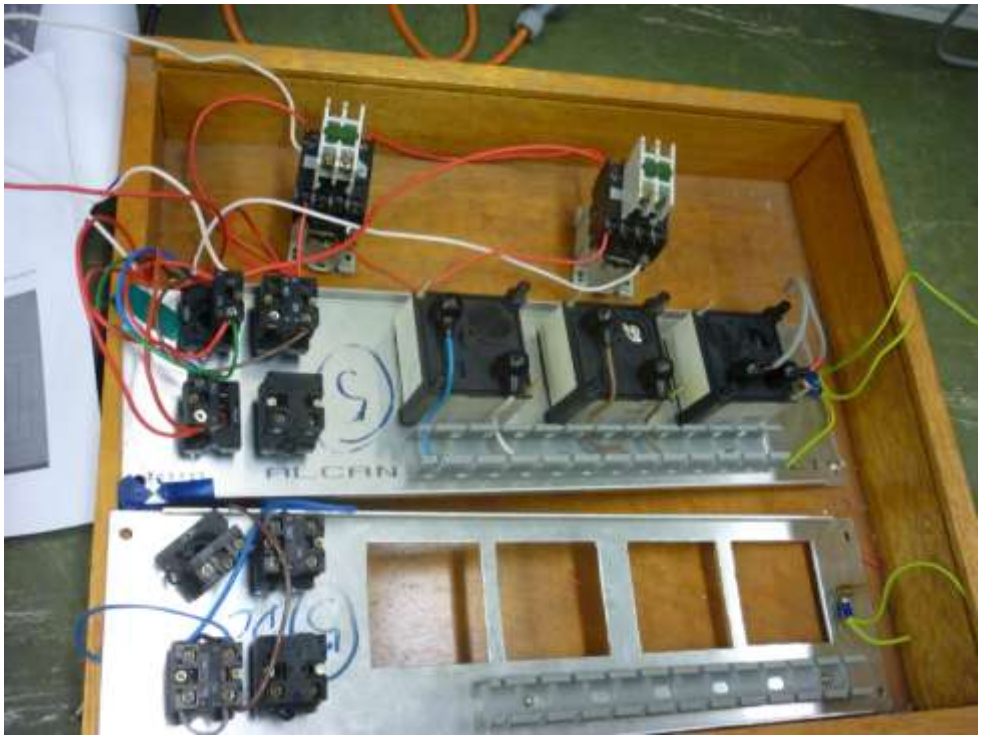
Connect the following forward reverse Connection motor control Direct Online Starter by using the given diagram.

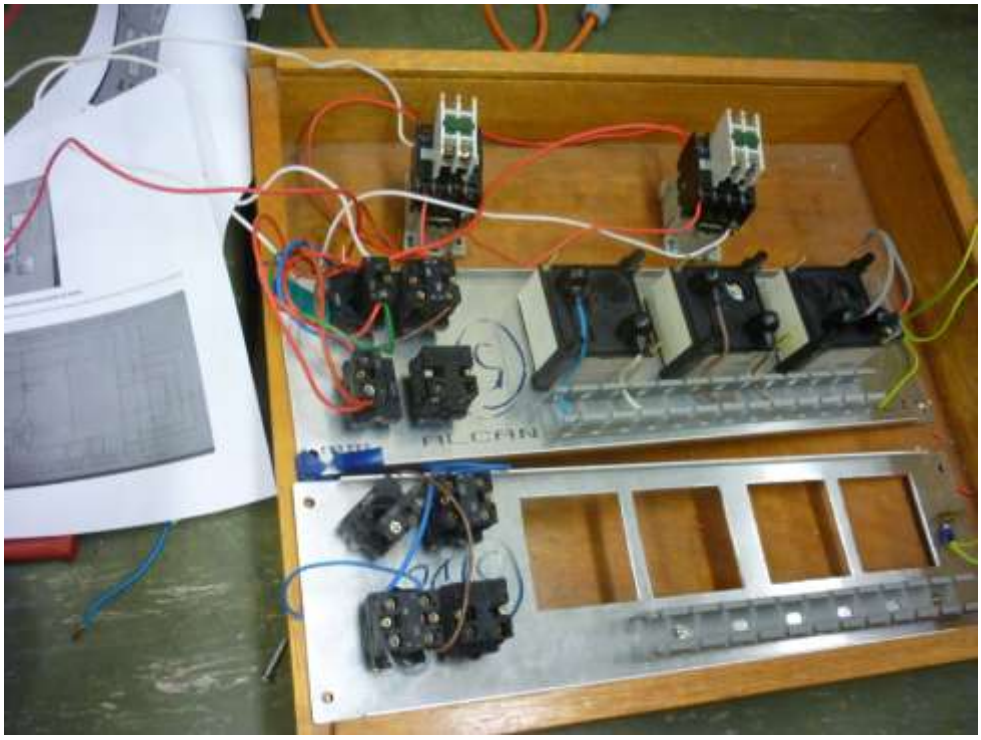



FWD
REV
ON
START
STOP



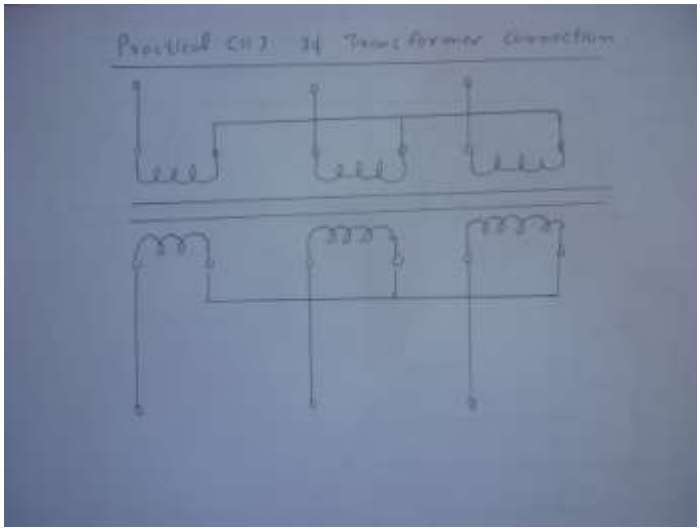



AL-CAN



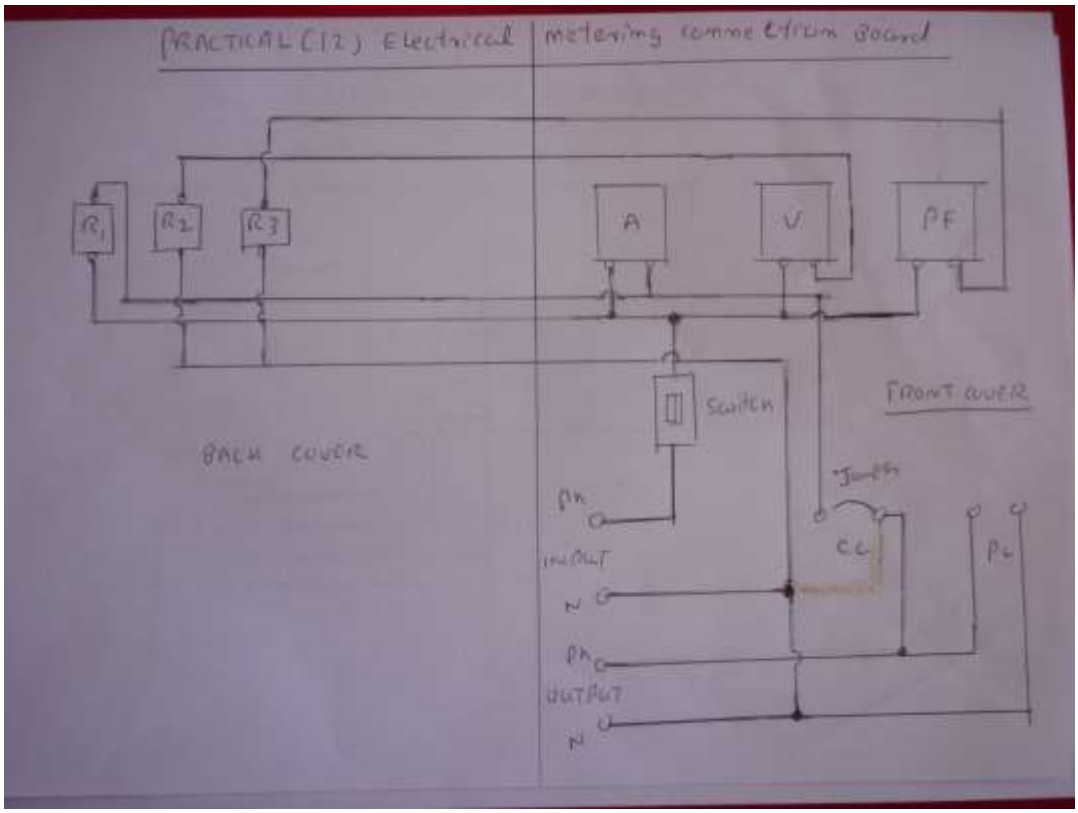
Practical (11) Three phase transformer connection.

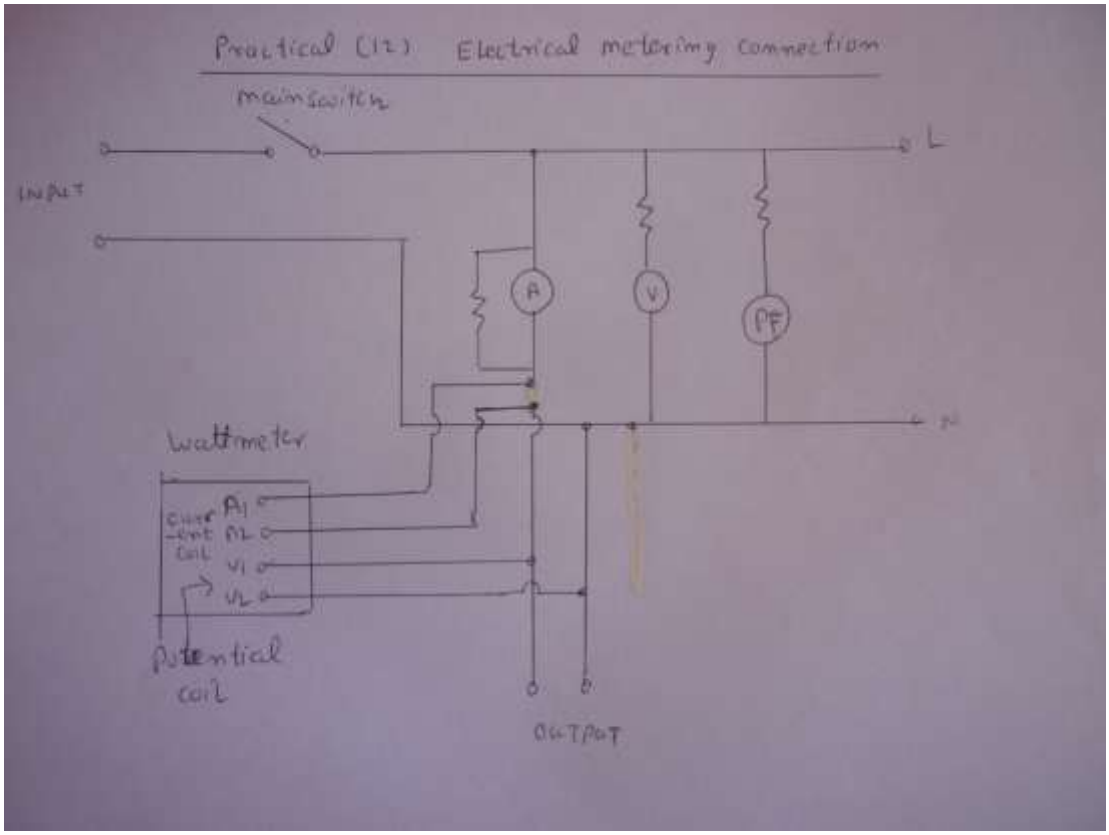
Connect the following three phase transformer connection by using the given circuit diagram.

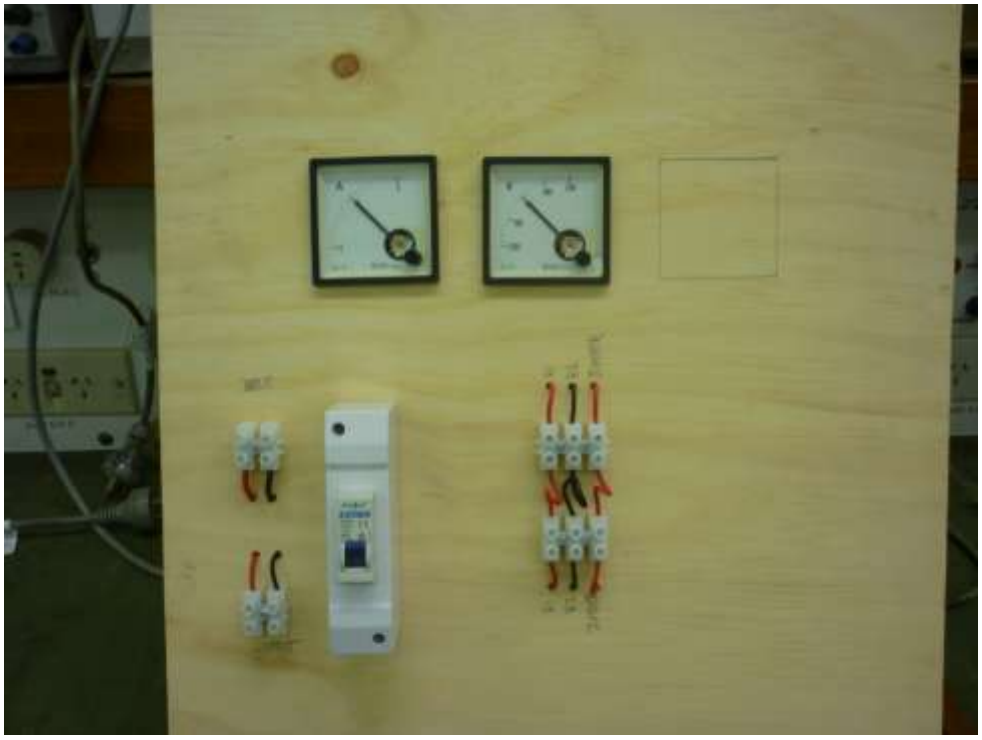


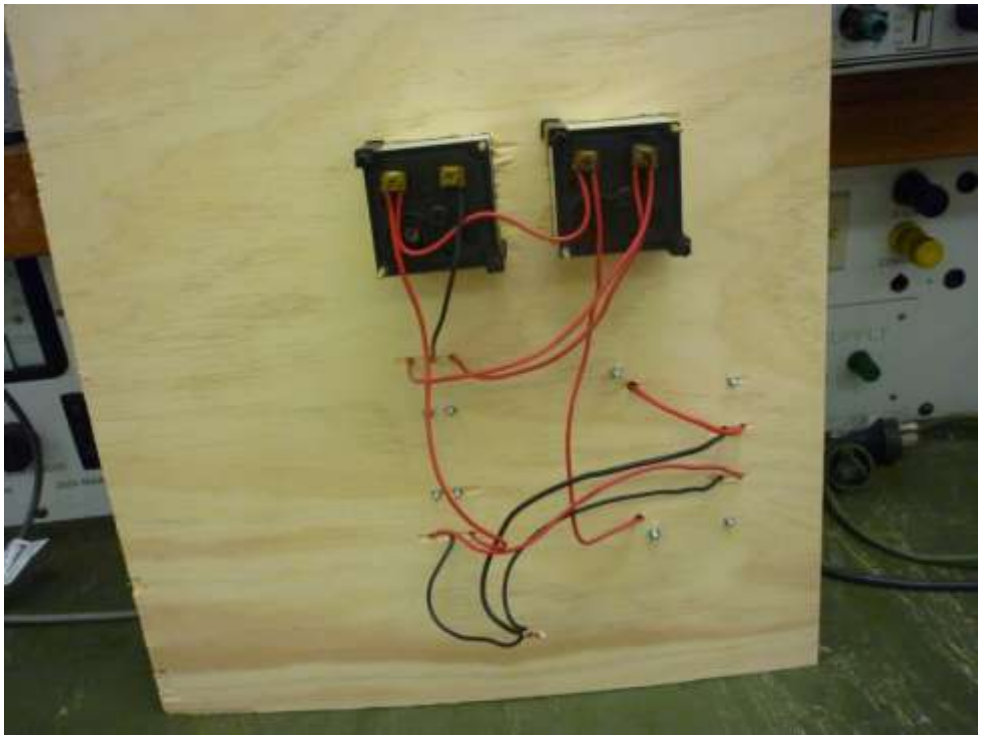
Practical (12) Metering panel connection

Connect the following metering equipments.



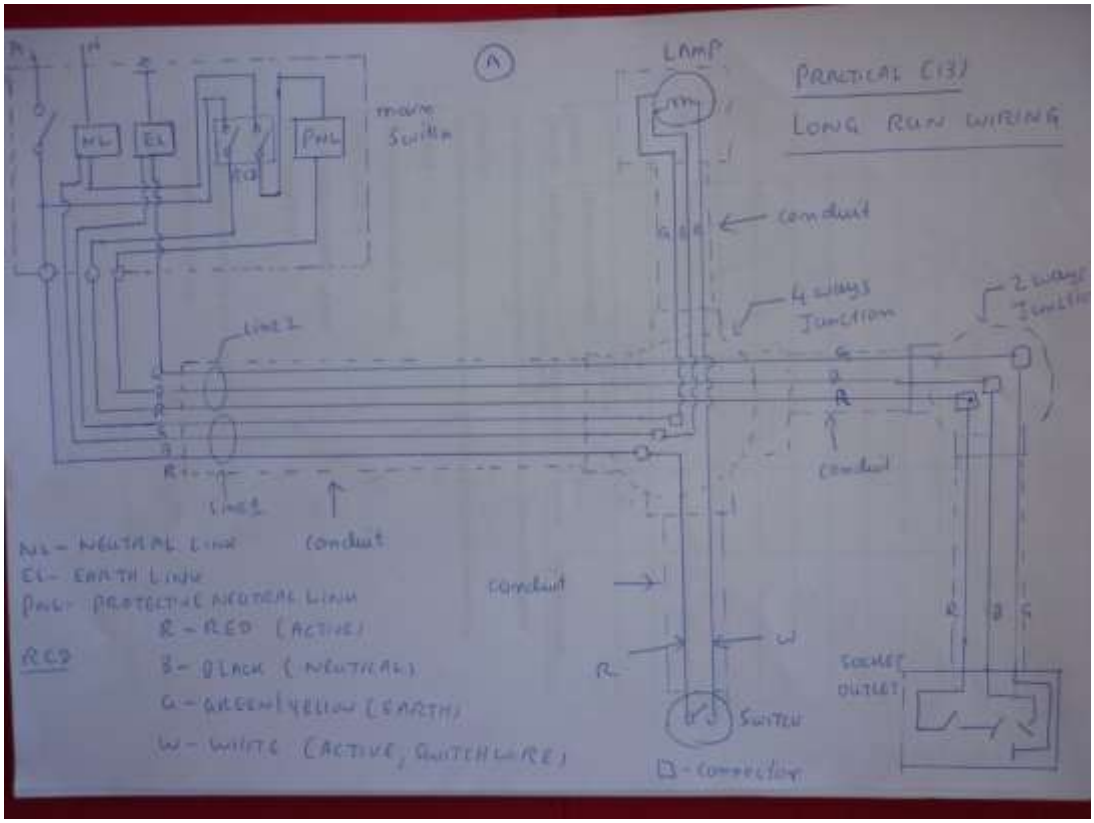

Practical (12) Electrical metering connection
main switch
INPUT
L
A
V
PF
Wattmeter
Current Coil
A1
A2
V1
V2
Potential coil
OUTPUT

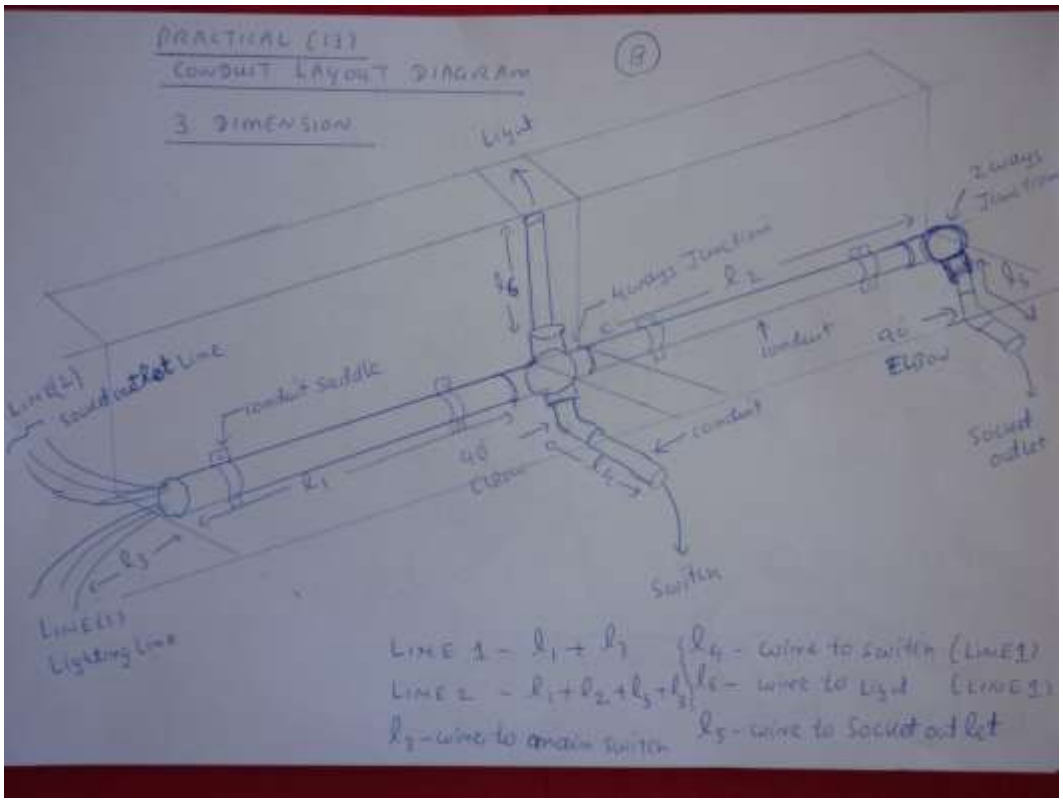


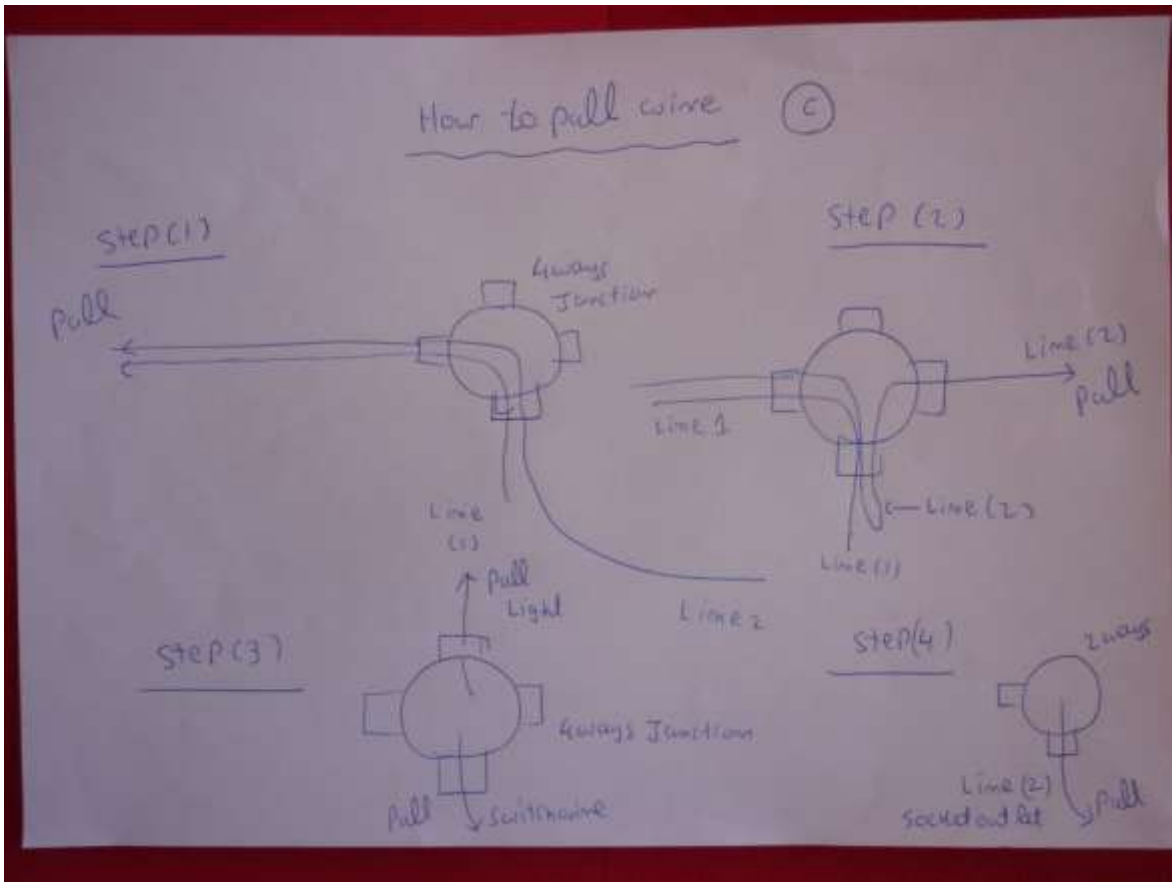


Practical (13) Long run wiring

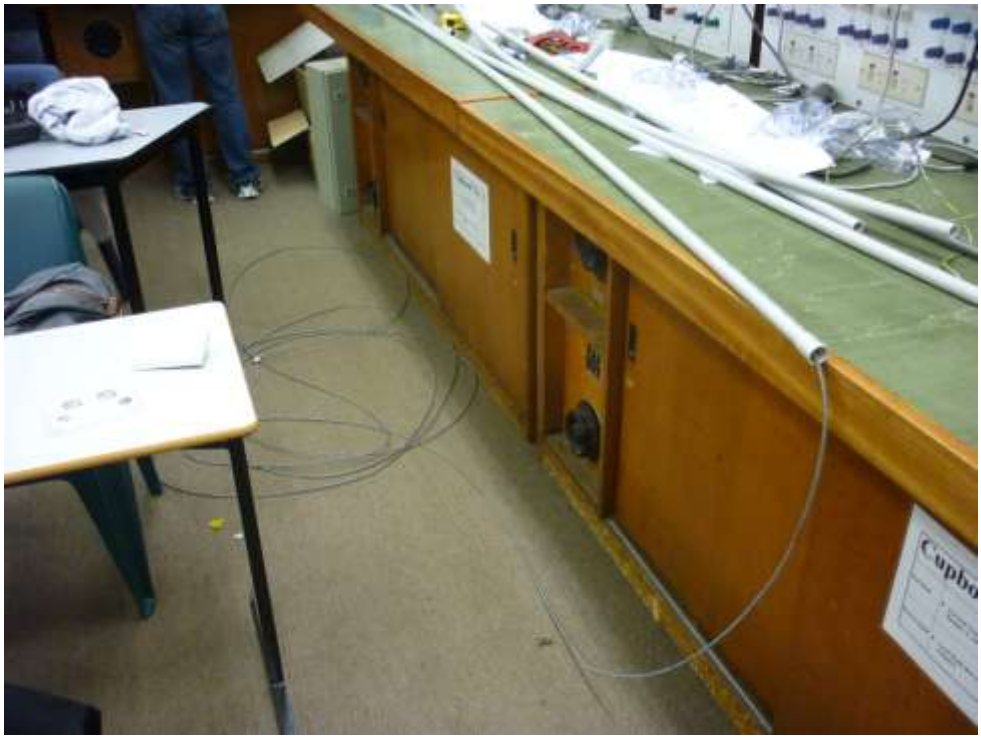
Install the following long run wiring by using the following circuit connection and conduit layout diagrams.

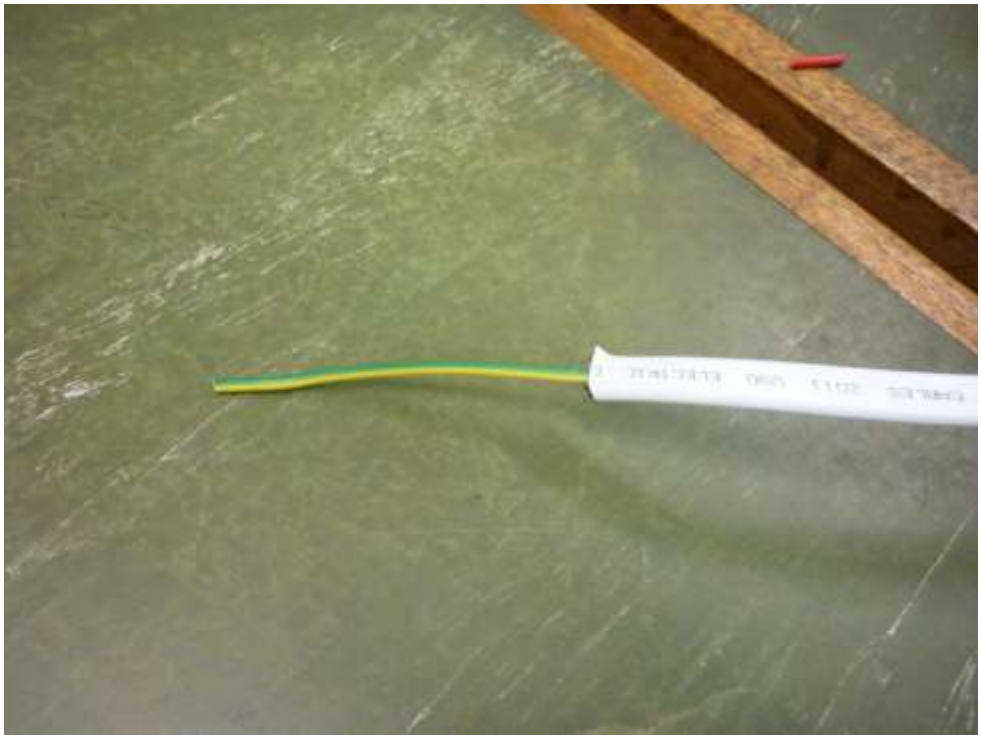


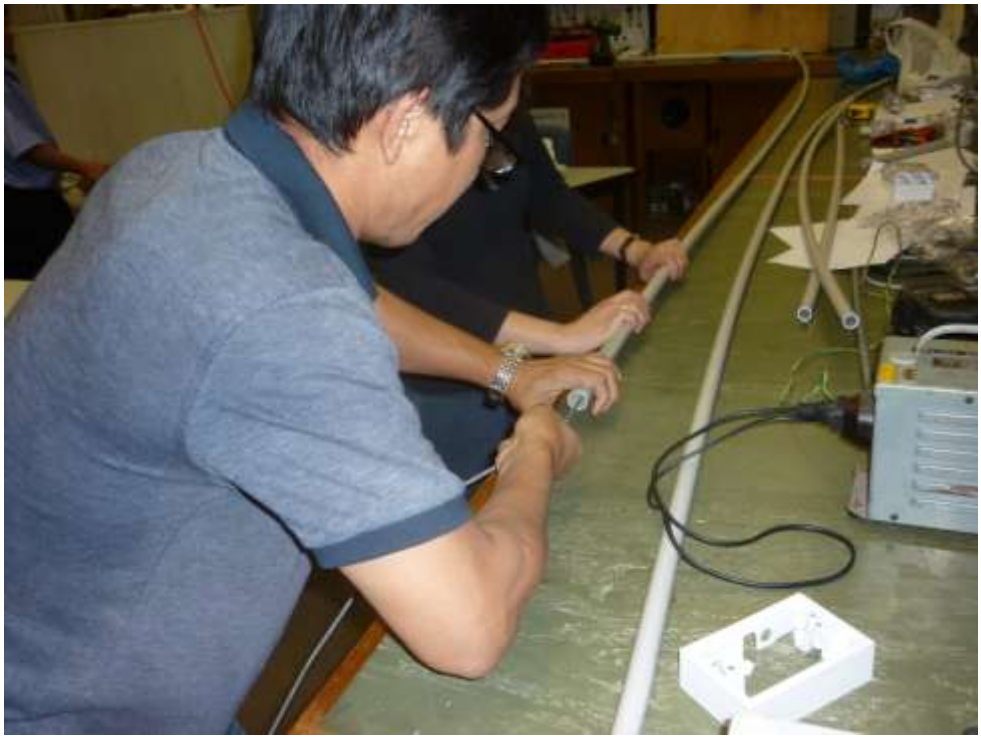

PRACTICAL (13)
CONDUIT LAYOUT DIAGRAM
3 DIMENSION
(B)
Light
Always Junction
l_2
l_6
l_5
conduit saddle
conduit
90° ELBOW
Socket outlet
l_1
90° CLOSE
l_4
Switch
l_3
LINE(1) Lighting Line
LINE 1 - $l_1 + l_3$ { l_4 - wire to switch (LINE 1)
LINE 2 - $l_1 + l_2 + l_3 + l_5$ { l_6 - wire to Light (LINE 2)
l_3 - wire to main switch
l_5 - wire to Socket outlet

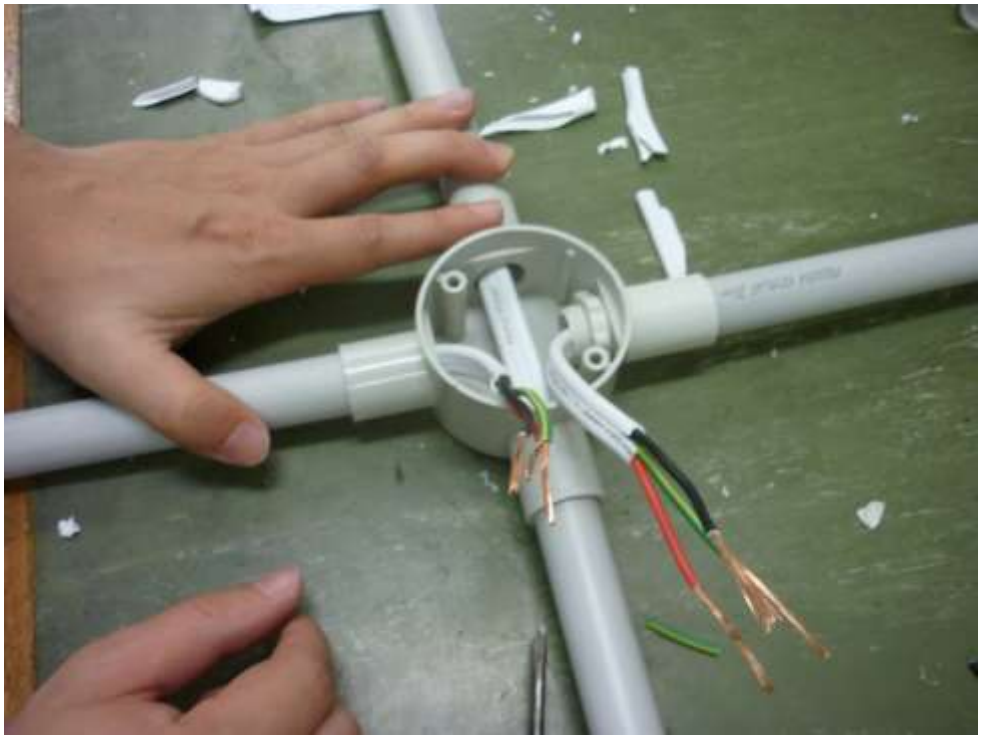

How to pull wire
(C)
STEP(1)
Pull
Always Junction
STEP (2)
Line (2) Pull
Line 1
Line (2)
Line (1)
Line (1)
Pull Light
Line 2
STEP(3)
Always Junction
Pull
Switchwire
STEP(4)
2 ways
Line (2) Socket out let
Pull

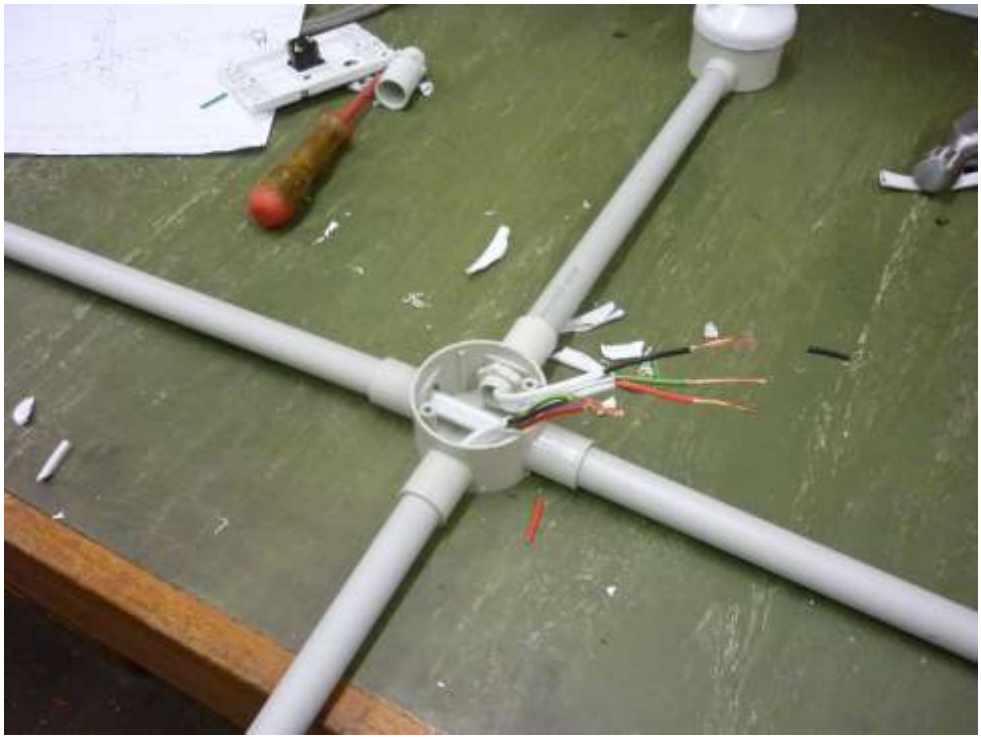

Cut Cable
CONNECTOR STRIP











Practical (14 +15+ 16) Electrical Installation Safety Testing

Perform the electrical installation safety by referring circuit safety testing and verification instruction book.

http://www.filefactory.com/file/c4bbed5/n/Circuit_safety_Testing_and_Verification.zip

Practical 17+18 Motor Rewinding

Rewind the motors as instructed by teacher