UEENEEG107A (SIN S7324)
Select wiring systems and cables for low voltage general electrical installations

Student Name:		Student ID:	
Assessment Due Date:		**Portfolio of Evidence**	

STUDENT DECLARATION
I certify that I understand the assessment instructions (see page over) and the submitted work is my own.

Signed: _____

Assessment Notes **Pass Mark 100%**

Time allowed: To be successfully completed before the completion of this unit.
Aids Permitted: See on page 3 of this assessment.

Assessor Feedback	
Performance demonstrated by this assessment is:	Satisfactory **(S)** or Not Yet Satisfactory **(NYS)**

Assessor Comment:

☐ Review all the worksheets and/or exercises.
☐ Attend evening tutorials.
☐ Join a study group.
☐ Apply for a reassessment before the end of your enrolment period.
☐ Other:

Notes:
1.You are allowed two assessment attempts in the enrolment period.
2.Failure to achieve a Satisfactory Result within the enrolment period will require re-enrolment.
3.You have the right to appeal your assessment result.

Assessor Name:	Assessor Signature:
Date assessment outcome and feedback received on:	Student Signature:

Instructions

Students are required to prepare and submit a Portfolio of Evidence for the given 400 volt three phase domestic installation.

The portfolio must include information required to select electrical cables and switchboard equipment to comply with all relevant regulatory requirements.

Refer to the attached single domestic installation floor plan and complete the following:

- Using the AS/NZS 3000 Table C9, decide the number of components on each lighting & power circuits so they do not exceed the rating of the chosen circuit breakers. **(Page 4)**.
- State correctly each electrical accessory item (i.e. phases/current/watts), the total quantity for each electrical accessory item & what circuit or circuits that they will be installed on for the switchboard layout. **(Pages 4 & 5)**.
- State the circuit title, No. of points (show breakdown of selection), maximum demand (show calculations for validation), circuit breaker size, active & earth conductor sizes and the fault loop impedance for all **final sub-circuits**. Supply the clause/table from the AS/NZS 3000, AS/NZS 3008 & WAER to validate your answers**. (Page 6)**
- Produce a neat **COLOURED** sketch of the switchboard layout and include the following information: **(Page 7)**
    a) Draw the switchboard components, in the same order as the final sub-circuit identification chart on **page 6** of this portfolio.
    b) The location and rating of the main switch and all protective devices.
    c) The location & sizes of the MEN and equipotential bonding conductors.
    d) The location of the Main Earth Stake & Consumer Mains route.
    e) Show a correctly coloured wiring diagram, with conductor sizes, for all of the components' feeds.
    f) Correctly label all components with amperage size, type of circuit protection & neutral link numbers where applicable.
- Fill in the maximum demand calculation table correctly and calculate the maximum demand of the installation. **(Page 8)**
- Select the appropriate conductor size for this calculation and state the information pathway for your **C.C.C.** selection. **(Page 8)**
- Allowing **2% Vd.** for the consumer mains, calculate the correct conductor size for volt drop purposes. The route length is 25m. Calculate the actual voltage available at the switchboard. Show all working. **(Page 9)**

- Allowing a **3% Vd.** for the air conditioner cable, select the correct conductor (explaining your selection) and then calculate the actual voltage at the air conditioner when the unit is operating at full load. The route length is 17m. Show all working. **(Page 9)**
- Prove co-ordination of the air-conditioner circuit. State the correct clause and the pathway of your C.C.C. selection.**(Page 9)**

Correctly complete the Results Table on page 10.

- Select the minimum permissible size, type & installation method for the consumer mains cable.
- The minimum size of the main earthing conductor.
- The minimum size of the MEN cable **(UNPROTECTED SOURCE)**.
- All cables (except mains) are installed within 100mm of the ceiling and V90 TPS cables are used throughout the installation.

There is no requirement to allow for future growth.

Rules of the Assessment

- Check that your name & student ID is correct on all assessment sheets.
- Ask the assessor for help if you have difficulty understanding or performing the tasks.
- Do not discuss the task with other applicants or ask them for help during your assessment.
- Follow all essential safety requirements when performing this task.

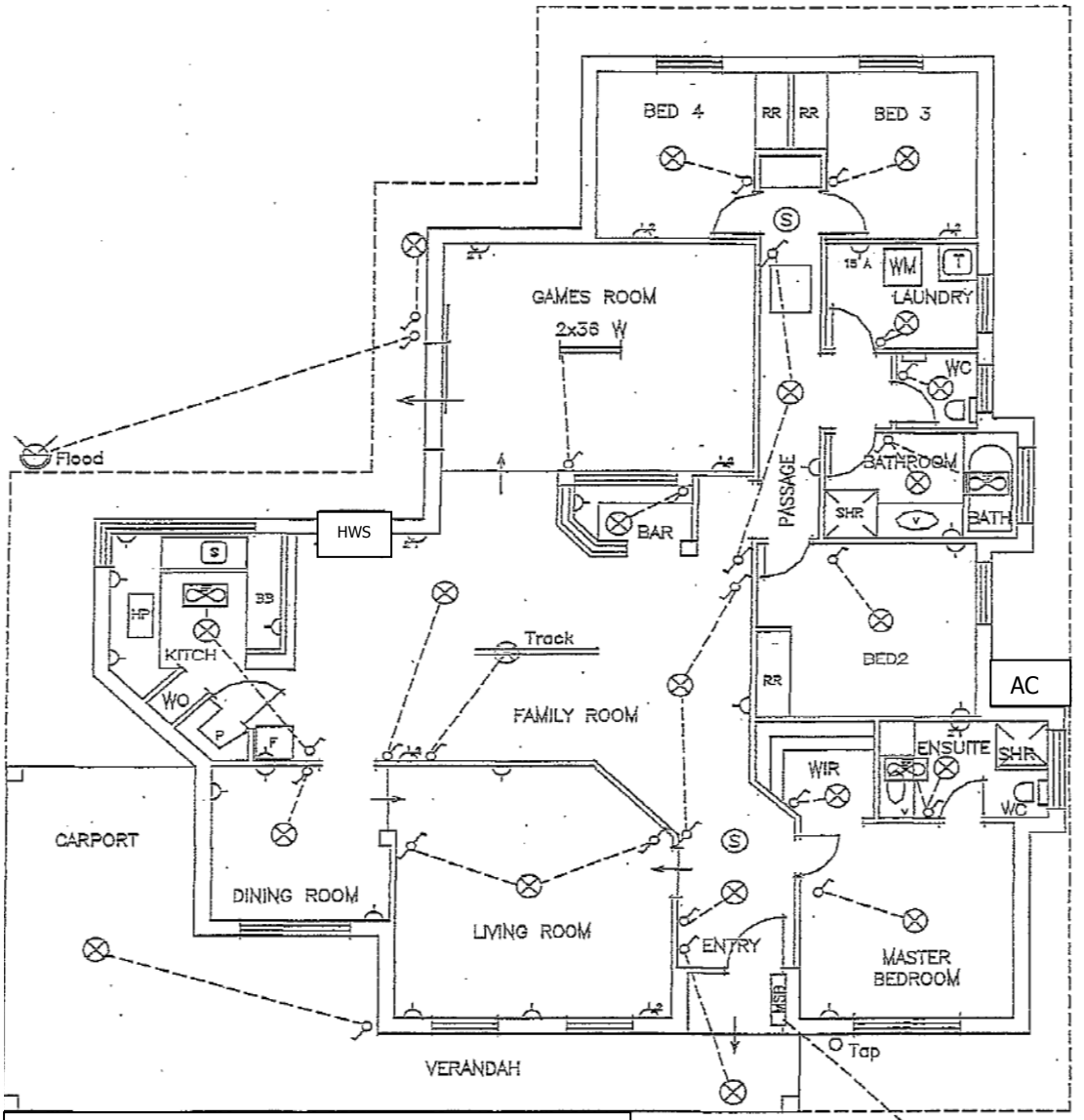
Aids Permitted

- G107A Resource book
- Lecturer handouts
- AS/NZS 3000:2018 Wiring Rules (Including all amendments)
- AS/NZS 3008:2017 Cable Selection (Including all amendments)
- WAER – 2014 Version
- The internet

Students are reminded of their right to appeal an assessment process.

Single Domestic Installation – Araluen

Construction: Double brick
Pitched tile roof
Plaster ceilings
Lined eaves



Hot Plate – 5kW (single phase – 230V)
Wall Oven – 4kW (single phase – 230V)
Solar HWS Booster – 3.6kW (single phase – 230V)
Fixed – Reverse Air Conditioner (12A/phase–400V)
Outdoor Floodlight 20W-LED (single phase – 230V)
Exhaust Fans – 60W (single phase – 230V) EF
Smoke Detectors – Photo Electric Type
Track Lighting – 2 metres long
Gas Space Heating

Underground Consumer's Mains

Point of Supply Pillar

Three Phase 400V

Electrical accessories take off table

Item	Quantity	Circuit

Final Sub-circuits							
Circuit No	**Circuit Title ID**	**No of Points per circuit**	**Max. Demand**	**Circuit Breaker Size**	**Active Conductor Size**	**Earth Conductor Size**	**Fault Loop Impedance**
1							
2							
3							
4							
5							
6							
7							
8							
9							

Supply the clause/table from the AS/NZS 3000, AS/NZS 3008 & WAER to validate your answers	
Fault Loop Impedance	
Earth Conductor Size	
Active & Neutral Conductor Sizes	
Co-Ordination between Conductors & Circuit Protection Devices	

Switchboard Layout & Wiring Diagram

Maximum Demand Calculation Table

Job/Circuit description - _____ Selection Criteria - AS/NZS3000:2007

Load Group	Load	Remarks	Calculations	Load distribution			Contribution/phase (amps)		
				R	W	B	R	W	B

VOLT DROP CALCULATIONS

Consumer Mains Cable

Final Sub-Circuit (Air-conditioner):

Prove Co-ordination for the air-conditioner circuit:

RESULTS TABLE		
Maximum Demand		
Consumer's Mains Cable	**Size**	
	Type	
	Installation Method	
Minimum Size of Main Earthing Conductor		
Validating clause or table number		
Minimum Size of MEN Conductor		
Validating clause or table number		
Voltage at Air Conditioner		
Main Switch Current Rating		
Validating clause or table number		