

# Maximum Demand

NZCEE year 1

# Factors to consider

- Maximum demand
- Voltdrop
- Earthing system of an electrical installation

<https://youtu.be/8bpHMvg1rsk>

# Maximum demand

- The maximum demand in consumers mains, sub mains and final sub circuits, taking account of the physical distribution and intended usage of electrical equipment in the electrical installation and the manner in which the present requirements might vary, shall be determined using one of the methods set out in Items (a) to (d).  
As per AS/NZS 3000:2007 2.2.2
- If the actual measured maximum demand is found to exceed that obtained by calculation or assessment, the measured value shall be deemed to be the maximum demand.

# Calculation of maximum demand

- A)Calculation The maximum demand may be calculated in accordance with the guidance given in Appendix C for the appropriate type of electrical installation and electrical equipment supplied. It is recognized that there may be considerable differences in loading from one electrical installation to another. Alternative methods of calculating the maximum demand may be used taking account of all the relevant information available for any particular electrical installation.

- b) Assessment The maximum demand may be assessed where—

(i) the electrical equipment operates under conditions of fluctuating or intermittent loading, or a definite duty cycle; or

(ii) the electrical installation is large and complex; or

(iii) special types of occupancy exist.

- c) Measurement The maximum demand may be determined by the highest rate of consumption of electricity recorded or sustained over any 15 min period or periods when demand is at its highest by a maximum demand indicator or recorder.
- D) Limitation The maximum demand may be determined by the current rating of a fixed setting circuit-breaker, or by the load setting of an adjustable circuit-breaker.

## *Calculation of Maximum demand*

A 1 phase domestic installation has the following loads:-

- 23 Light points
- 2 numbers 15 A Socket outlets
- 6 single socket outlets
- 10 double socket outlets
- Cooking Range 10 kW
- Hot water controlled 4.8 kW
- 4 Flood lights 300 W each



Load	Quantity	Load Group	Calculation	Current in Amps
Lighting points	23	A (i)	First 20 Lights = 3 A Add 2 A for next every 20 =2 Total Lighting Demand = 3+2=5 A	5.00
300W flood lights Outdoor Lighting	4	A (ii)	75% of Total Load $\frac{4 \times 300 \times 0.75}{240}$	3.75
Single socket outlets	6	B(i)	First 20 outlets 10 A and add 5 A in steps for every 20 outlets $10 + 5$	15.00
Double Socket Outlets	10			
15 A Socket outlets	2	B(ii)	One or more 15 A outlets =10	10.00
Cooking Range 10 KW	1	C	50% of connected load	20.83
Controlled Hot water Heater 4.8 KW	1	F (i)	Full Connected load	20.00
Total Demand Current				74.58

## Calculation of Maximum demand -

- A domestic installation has the following loads:-
- 18 lights; 20 socket outlets ; 3.6 kW air conditioner
- Cooking Range 9 kW( 5 kW Hotplate and 4 kW oven)
- 12.96 kW 3 Phase Instantaneous Hot Water heater;  
Each phase current is 18 A/Phase

Load	Red	White	Blue
Lighting	18 points		
Socket outlets		10	10
Range	Plate 5 kW	Oven 4 kW	
Water Heater			
Air Conditioner			3.6 kW

Load	Quantity	Load Group	Calculation	Current in Amps		
				L1	L2	L3
Lighting points	18	A (i)	First 20 Lights = 3 A	3.00		
Socket outlets	10	B(i)	First 20 outlets 10 A and add 5 A in steps for every 20 outlets 10		10.00	
Socket outlets	10	B(i)	First 20 outlets 10 A and add 5 A in steps for every 20 outlets 10			10.00
Hotplate	1	C	5 kW 50% Connected Load	10.4		
Oven	1	C	4 kW 50% Connected Load		8.3	
Air Conditioner	1	D	3.6 kW 75% Connected Load			11.25
3 Phase instantaneous Hot water Heater	1	E	18/3	6	6	6
Total Demand Current				19.4	24.3	27.3