

Q007

Pb

DETERMINE THE MAXIMUM DEMAND OF THE HAVIEST  
LOADED PHASE OF A BLOCK OF 80 UNITS COMPRISING  
THE FOLLOWING LOADS.

LIGHTING - 80 UNITS

10A SOCKET OUTLET - 80 UNITS

ELECTRIC RANGE - 17 UNITS

2.5 kW (10.4 A) PERMANENT STRIP HEATER - 80 UNITS

QUICK RECOVERY WATER HEATERS - 80 UNITS

LOADING NOT ASSOCIATED

{ 90 - 60W LIGHTING POINTS

21 - 100W LIGHTING POINTS

TOTAL LIGHTING = 7.5 kW

20 - 10A SINGLE SOCKET OUTLETS

10 - 3.6 kW CLOTH DRYERS

2 - 12 kW LIFT MOTORS

1 - 5.5 kW 3 $\phi$  PUMP MOTOR

1 - 4 kW  
3 $\phi$  WATER  
SUPPLY  
MOTOR

TABLE C1, BLOCK LIVING COL 4 & 5

$$\text{INDIVIDUAL UNITS / PHASE} = \frac{80}{3} \approx 27 \text{ UNITS.}$$

HEATER + WATER HEATER

$$\text{RANGE / PHASE} = \frac{17}{3} \approx 6$$

TABLE C1

EQUIPMENT	LOAD GROUP	COLUMN	CALCULATION	RESULT (AMP)
LIGHTING	A(1) 21 OR MORE x 0.5 AMP/UNIT (27 UNITS x 0.5)	5	$27 \times 0.5 \text{ AMP/UNIT}$	13.5 AMP
SOCKET OUTLET	B(1) $50 + 1.9 \text{ A/UNIT} \times \text{UNIT}$	5	$50 + 1.9 \text{ A/UNIT} \times 27 \text{ UNITS/PH}$	101.3 AMP
ELECTRIC RANGE	6 → 20 UNITS $2.8 \text{ A/UNIT} \times \text{NO. OF UNIT}$	4	$2.8 \times 6$	16.8 AMP

INDIVIDUAL UNIT

EQUIPMENT	LOAD GROUP	COLUMN	CALCULATION	RESULT (AMP)
STRIP HEATERS	SPACE HEATING 75% CONNECTED LOAD	5	$0.75 \times \frac{2.5 \times 10^3}{240} \times 27$	210.6 AMP
WATER HEATER	STORAGE HEATER 21 UNITS (OR) MORE $100A + 0.8A / \text{UNIT} \times \text{NO. OF UNIT}$	5	$100 + 0.8 \times 27$	121.6 AMP
TOTAL				<u>463.8 AMP</u>

## II COMMON LOADS

EQUIPMENT	LOAD GROUP	COLUMN	CALCULATION	RESULT
COMMUNAL LIGHTING	(H) FULL LOAD $7.5 \text{ kW} \times 10^3$ $240 \times 3 \text{ Ph}$	3/4/5	$\frac{7.5 \times 10^3}{240 \times 3} = 10.4 \text{ A}$	10.4A
10A SINGLE OUTLET	$\frac{200 \text{ OUTLET}}{3 \text{ Ph}} = 7 \times 1A / \text{UNIT}$ OVER 21 → 1A/UNIT	4	$1 \times 7 = 7 \text{ A}$	7A



EQUIPMENT	LOAD GROUP	COLUMN	CALCULATION	RESULT
3.6 kW CLOTH DRYER $\frac{10}{3} \approx 4$ / ph	J 50% CONNECTED LOAD 2+ UNITS / ph	3/4   5	$0.5 \times \frac{3.6 \times 10^3 \times 4}{240}$	30
LIFT				NIL
<u>MOTOR</u> 5.5 kW 3 $\phi$ PUMP MOTOR 4 kW 3 $\phi$ WATER SUPPLY MOTOR	TABLE (C2) <u>RESIDENTIAL</u> HIGHEST RATED + 50% OF MOTOR REMAINDER	COL 3/4   5	$\frac{5.5 \times 10^3}{240} + 0.5 \times \frac{4 \times 10^3}{240}$	14.6
				62A

$$\text{TOTAL} = 463.8 + 62 = 525.8 \text{ Amp.}$$