SINGLE FAMILY SERVICE LOAD CALCULATIONS
BASED ON THE 2023 NEC SECTION 220.82

PROJECT NAME SAMPLE
PANEL NAME MAIN PANEL

GENERAL LOADS NEC 220.82(B)

TOTAL SQ FOOTAGE (1,500 SQ FT X 3 VA) =	4,500 VA
APPLIANCE CIRCUITS (2 X 1,500 VA) =	3,000 VA
LAUNDRY CIRCUITS (1 X 1,500 VA) =	1,500 VA
RANGE (1 RANGE X 12,000 VA) =	12,000 VA
DRYER (1 DRYER X 5,500 VA) =	5,500 VA

APPLIANCES FASTENED IN PLACE NEC SECTION 220.53

WATER HEATER (1 X 4,500 VA) =	4,500 VA
FURNACE (1 X 7.2 A X 120 V) =	864 VA
DISPOSAL (1 X 6.5 A X 120 V) =	780 VA
DISHWASHER (1 X 11.2 A X 120 V) =	1,344 VA
MIRCOWAVE (1 X 9.0 A X 120 V) =	1,080 VA
CENTRAL VAC (1 X 12.0 A X 120 V) =	1,440 VA

MISC LOADS NEC 220.82(B)(4)

TOTAL GENERAL LOAD	36,508 VA
FIRST 10 KVA AT 100%	10,000 VA
REMAINDER OF LOAD AT 40%	10,603 VA
SUB TOTAL GENERAL LOAD	20,603 VA
LARGEST HEATING OR COOLING LOAD	0 VA
TOTAL KVA	20,603 VA
TOTAL AMPS (20,603 VA ÷ 240 V) =	86 A
FUTURE AMPS (0%)	0 A
DESIGN AMPS	86 A

HEATING & COOLING LOADS - NEC 220.82(C)

(1) AC LOAD (0 VA X 100%) = 0 VA	< < LARGEST
(2) HEAT PUMPS NO SUPP (0 VA X 100%) = 0 VA	
(3) HEAT PUMPS (0 VA X 100%) = 0 VA	
SUPPLEMENTAL HEAT (0 VA X 65%) = 0 VA	
(4) ELECTRIC SPACE (0 VA X 65%) = 0 VA	
LESS THAN FOUR SEPARATELY CONTROLLED UNITS.	
(5) SPACE HEATING (0 VA X 40%) = 0 VA	
MORE THAN FOUR SEPARATELY CONTROLLED UNITS.	
(6) SPACE HEATING (0 VA X 100%) = 0 VA	
CONTINUOUS AT THE FULL NAMEPLATE VALUE.	
LARGEST HEATING OR COOLING LOAD	0 VA

NEUTRAL LOAD NEC 220.61

TOTAL SQ FOOTAGE (1,500 SQ FT X 3 VA) =	4,500 VA
APPLIANCE CIRCUITS (2 X 1,500 VA) =	3,000 VA
LAUNDRY CIRCUITS (1 X 1,500 VA) =	1,500 VA
TOTAL CONNECTED NEUTRAL LOAD	9,000 VA
FIRST 3,000 VA @ 100% (3,000 VA X 1.00) =	3,000 VA
3,000-120,000 VA @ 35% (6,000 VA X 0.35) =	2,100 VA
OVER 120,000 VA @ 25% (0 VA X 0.25) =	0 VA
SUBTOTAL	5,100 VA
RANGE DEMAND	
TABLE 220.55 COLUMN C	
70% OF TABLE 220.55 (8,000 VA X 0.70) =	5,600 VA
DRYER DEMAND	
TABLE 220.54	
70% OF TABLE 220.54 (5,500 VA 1.00 VA X 0.70) =	3,850 VA
UNBALANCED MISC LOADS	0 VA
NEUTRAL LOAD VA	14,550 VA
NEUTRAL LOAD (14,550 VA ÷ 240 V) =	61 A
FURTHER DEMAND FACTOR - NEC 220.61(B)(2)	
FIRST 200 A @ 100% (61 A X 1.00) =	61 A
REMAINDER @ 70% (0 A X 0.70) =	0 A
MINIMUM NEUTRAL CONDUCTOR AMPACITY	61 A

VOLTAGE DROP CALCULATIONS

(2 X 25' L X 0.1940 R X 86.0 A ÷ 1,000) = 0.8 VD
(0.8 VD ÷ 240 V X 100) = 0.3 % VD

FAULT CURRENT CALCULATIONS

((22,000 AFC X 1.00 UA) + 0 MC) = 22,000 AFC
(2 X 25 L X 22,000 AFC) ÷ (5,907 C X 1 N X 240 V) = 0.776 CF
(1) ÷ (1 + 0.776 CF) = 0.563 CM
(22,000 AFC X 0.563 CM) = 12,386 CLC

KEY
A - Amps
AFC - Available Fault Current
C - Conductor Constance
CF - Conductor Factor
CLC - Conductor Let Through Current
CM - Conductor Multiplier
L - Length
MC - Motor Contribution
N - Number of Conductors
R - Resistance
UA - Utility Adjustment
V - Volts
VA - Volt Amps
VD - Voltage Drop