

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

GENERAL LOADS NEC 220.82(B)

TOTAL SQ FOOTAGE (1,000 SQ FT X 3 VA) = 3,000 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

DRYERS (0 ON ANY 2 PHASES) = 0 VA

WATER HEATERS (0 X 0 VA) = 0 VA

MISC LOADS NEC 220.82(B)(4)

DISHWASHER (1 X 10A X 120 V) = 1,200 VA

TOTAL GENERAL LOAD 20,700 VA
FIRST 10 KVA AT 100% 10,000 VA
REMAINDER OF LOAD AT 40% 4,280 VA
SUB TOTAL GENERAL LOAD 14,280 VA

HEATING & COOLING LOADS - NEC 220.82(C)

- (1) AC LOAD (8,000 VA X 100%) = 8,000 VA
(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 8,000 VA
TOTAL KVA 22,280 VA

TOTAL AMPS (22,280 VA ÷ 240 V) = 93 A
FUTURE AMPS (0%) 0 A

DESIGN AMPS 93 A

KEY (N) - Neutral
A - Amps
AFC - Available Fault Current
AL - Aluminum
C - Conductor Constance
CF - Conductor Factor

CLC - Conductor Let Through Current
CM - Conductor Multiplier
CU - Copper
GND - Ground
L - Length
MC - Motor Contribution

PROJECT NAME
DWELLING UNIT SAMPLE
DP1

NEUTRAL LOAD NEC 220.61

TOTAL SQ FOOTAGE (1,000 SQ FT X 3 VA) = 3,000 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 7,500 VA

FIRST 3,000 VA @ 100% (3,000 VA X 1.00) = 3,000 VA
3,000-120,000 VA @ 35% (4,500 VA X 0.35) = 1,575 VA
OVER 120,000 VA @ 25% (0 VA X 0.25) = 0 VA
SUBTOTAL 4,575 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 (0 VA 0.00 VA X 0.70) = 0 VA

UNBALANCED MISC LOADS 1,200 VA

NEUTRAL LOAD VA 11,375 VA

NEUTRAL LOAD (11,375 VA ÷ 240 V) = 47 A

FURTHER DEMAND FACTOR - NEC 220.61(B)(2)
FIRST 200 A @ 100% (47 A X 1.00) = 47 A
REMAINDER @ 70% (0 A X 0.70) = 0 A

MINIMUM NEUTRAL CONDUCTOR AMPACITY 47 A

VOLTAGE DROP CALCULATIONS

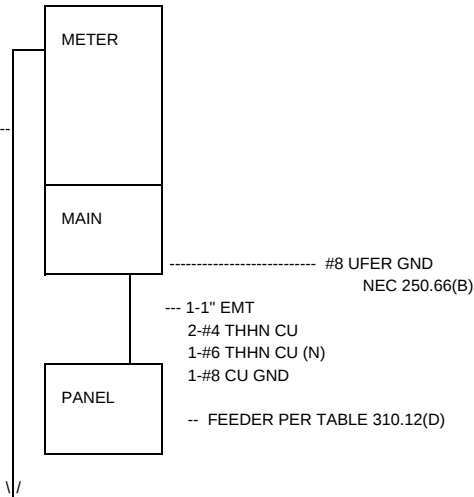
(2 X 20' L X 0.3080 R X 93.0 A ÷ 1,000) = 1.1 VD
(1.1 VD ÷ 240 V X 100) = 0.5 % VD

FAULT CURRENT CALCULATIONS

((14,000 AFC X 1.00 UA) + 0 MC) = 14,000 AFC
(2 X 20 L X 14,000 AFC) ÷ (3,806 C X 1 N X 240 V) = 0.613 CF
(1) ÷ (1 + 0.613 CF) = 0.620 CM
(14,000 AFC X 0.620 CM) = 8,680 CLC

< < LARGEST

2 1/2" PVC --



MAIN BREAKER MUST BE LOCATED OUSIDE
PER NEC 230:85

SURGE PROTECTION DEVICE REQUIRED
PER NEC 230:67