

Jackson Barracks 141st Field Artillery Battalion Readiness Center

UNIT HEATERS CALCULATIONS

May 3, 2006

35% Design Submittal

ELECTRIC UNIT HEATER SIZE- Jackson Barracks 141st Building

Design to maintain mechanical room 213 above 40 F

$$Q=AU\Delta T$$

A= 1910 ft²
U= 0.1
 ΔT = 20 F
conversion 3413 btu/kw
Q= 1.12 kw

Design to maintain sprinkler/Attic 141 st Building above 40 F

wall

$$Q_w=AU\Delta T$$

A= 56064 ft²
U= 0.08
 ΔT = 20 F
conversion 3413 btu/kw
Q_w= 26.28 kw

air change 1 per hr

V/60
V= 448500 ft³
7475 cfm

$$Q_A=1.08(\text{cfm})\Delta T$$

cfm= 7475
 ΔT = 20 F
conversion 3413 btu/kw
Q_A= 47.31 kw

Total Q

$$Q_T=Q_w+Q_A$$

Q_w= 26.28 kw
Q_A= 47.31 kw
Q_T= 73.59 kw

Design to maintain Centrl Plant above 40 F

wall

$$Q_w=AU\Delta T$$

A= 9752 ft²
U= 0.08
 ΔT = 20 F
conversion 3413 btu/kw
Q_w= 4.57 kw

air change 1 per hr

V/60
V= 156000 ft³
2600 cfm

$$Q_A=1.08(\text{cfm})\Delta T$$

cfm= 2600
 ΔT = 20 F
conversion 3413 btu/kw
Q_A= 16.45 kw

Total Q

$$Q_T=Q_w+Q_A$$

Q_w= 4.57 kw
Q_A= 16.45 kw
Q_T= 21.03 kw