A p p e n d i x   V

Design Calculations

Project		Prepared by	Date
Subject/Title		Reviewed by	Date
ERV calculations		Calculation Number	Sheet 1 of 2

Exhaust (total)

$$Tx-A \rightarrow (5) @ 180 \, cfm$$
$$Tx-B \rightarrow (5) @ 360 \, cfm$$
$$Tx-D \rightarrow (1) @ 180 \, cfm$$
$$\underline{\hspace{4cm}}$$
$$2880 \, cfm$$

RS·Means
$$\hookrightarrow 320 \, cfm = \$400$$

$$\Rightarrow \text{Exhaust cost}$$
$$= 2880 \times \frac{400}{320} = \$3600$$

ERV costs

$$\$3200 \times 2 = \$6400$$

$$\begin{array}{r} \$6400 \\ -\$3600 \\ \hline \$2800 \end{array} \leftarrow \text{Need to make up}$$

Sensible heat

$$\Delta T = (90° - 70°) = 20°$$

$$q = 1.08 \, cfm \, \Delta T$$
$$= (1.08)(2880)(20°) = 62,208 \, BTu/hr$$

* ERV is 50% more efficient

$$\Rightarrow 31,104 \, BTu/hr \, saving \quad @ 1 \, Kw/ton$$

$$\Rightarrow \frac{31,104}{12,000} = 2.59 \, Ton \times \frac{1 \, KW}{ton} = 2.59 \, kw$$

cost is 10¢/kw

$$\Rightarrow 25.9¢ \, saved \, per \, hour$$

Design Calculations

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	Calculation Number	Sheet 2 of 2

$$\frac{\$2800}{\$0.259/hr} = 10,810 \ hrs$$

→ If running 8 hrs per day @ 90°

$$10810 \ hr \times \frac{1 \ day}{8 \ hr} = 1351 \ days$$

→ assume 150 days a year where its at least 90°

$$\frac{1351}{150} = 9 \ years$$