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Optimizing Chilled Water Design in High-Rises in Hot, Humid Climates

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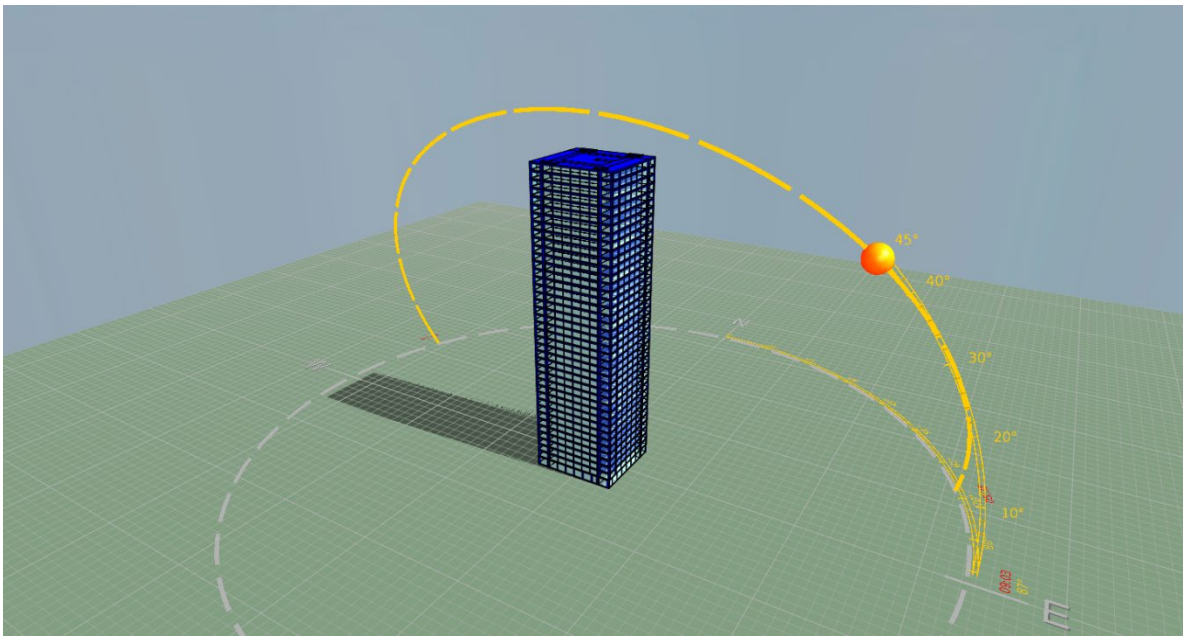

Online Figure 1: High-rise office building model geometry.

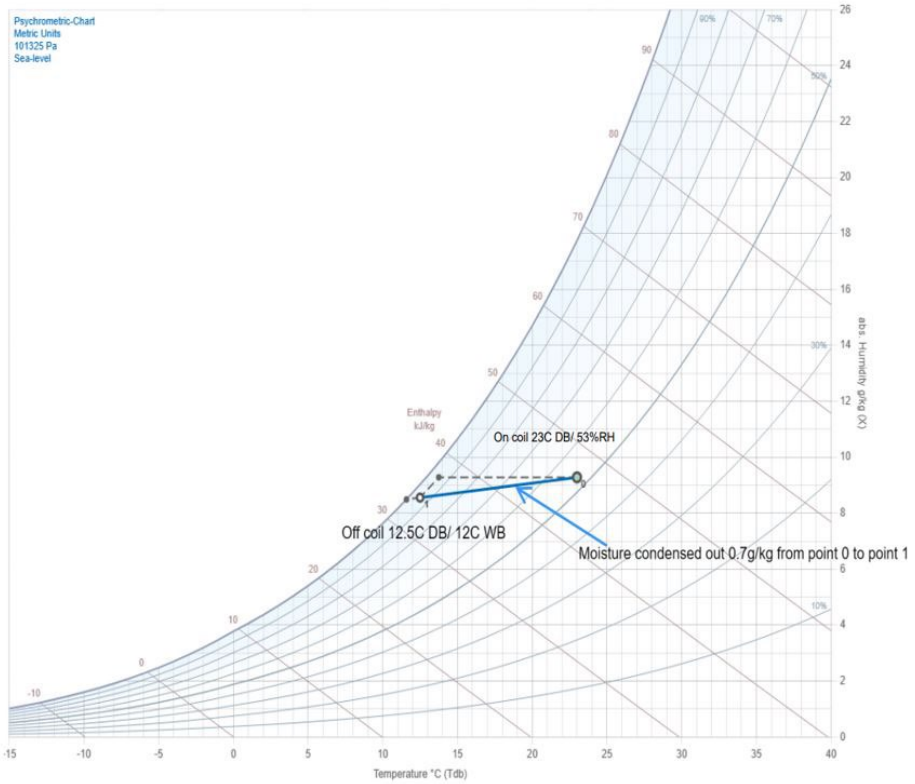

Figure 1.3.2: Psychrometric chart for FCU selection Inlet CHWT 6°C on coil 23°C DB/16.6WB off coil 12.5°C DB/12°C WB

Online Figure 2

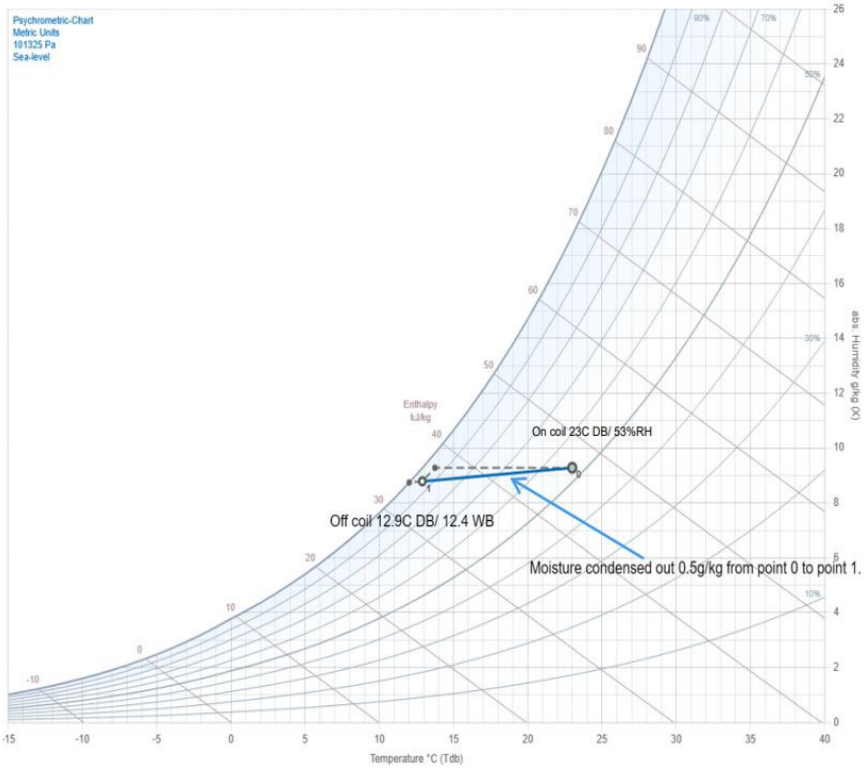

Figure: 1.3.3 Psychometrics chart FCU selection CHWT 6.5°C for on coil 23°C DB/16.6WB off coil 12.9°C DB/12.4°C WB

Online Figure 3

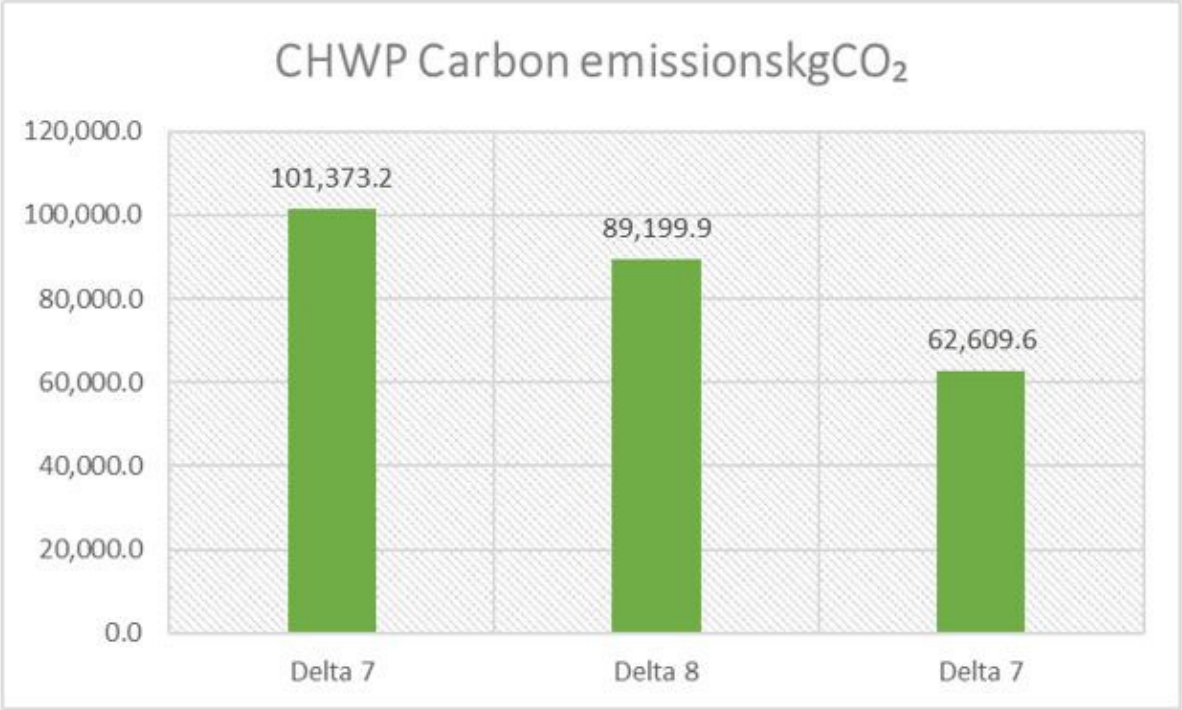

Figure1.5: CHWP carbon emissions

Online Figure 4

FCU & AHU POWER CONSUMPTION								
Des	CHW Inlet temperature	Fan Power consumption Delta T=7	Qty	Annual energy consumption Delta T=7	Fan Power at Delta T=8	Annual energy consumption Delta T=8	Fan Power consumption Delta T=9	Annual energy consumption Delta T=9
	^{0}C (^{o}F)	Watts		kWh (BTU)	Watts	kWh (BTU)	Watts	kWh (BTU)
FCU	6.5 (43.7)	140	490	156,956 ($5.3X10^{8}$)	150	168,168 ($5.7x10^{8}$)	157	176,015 ($6x10^{8}$)
AHU	6.5 (43.7)	8190	14	262,342 ($8.9X10^{8}$)	8,360	267,787 ($9.1x10^{8}$)	8360	267,787 ($9.1x10^{8}$)
FAHU	6.5 (43.7)	13570	4	124,192 ($4.2X10^{8}$)	13,970	127,853 ($4.3x10^{8}$)	13970	127,853 ($4.3x10^{8}$)
Total fan Energy				543,490 ($1.8x10^{9}$)		563,808 ($1.9x10^{9}$)		571,655 ($1.9x10^{9}$)

Online Table 1: FCU & AHU power consumption.