Kentucky CTE

Construction: Heat Load/Duct Design 480812 (2026–2027)

Terminology: 1	**a** Define “U” value. 1.A
	b Define “R” value. 1.B
	c Interpret heat transfer tables (“U,” “R”). 1.C
	d Calculate the total heat transfer valve of any surface (R) - (U). 1.D
	e Explain specific humidity, apparatus dew point, contact factor, relative humidity, dry-bulb, wet-bulb, dew point, and enthalpy. 1.E
Manual “J” Heat Loss Gain: 2	**a** Explain the heat load sources, conduction, infiltration, product, and miscellaneous loads (people, motors, and equipment). 2.A
	b Explain the purpose of vapor barriers. 2.B
	c Interpret tables of specific heat values, latent heat, and heat of respiration. 2.C
	d Calculate refrigeration-sensible heat ratio, contact factor, latent heat, sensible heat, total heat, water removal, and mixed air conditions. 2.D
	e Determine total resistance to heat flow (“R”), (“U”). 2.E
	f Interpret structure design data. 2.F
	g Interpret building prints. 2.G
	h Calculate conduction loss for walls, roof, floors, windows, basement (walls, floor), and unconditioned space. 2.H
	i Calculate infiltration: doors, windows. 2.I
	j Calculate ventilation load. 2.J
	k Calculate duct loss. 2.K
	l Calculate “U” values for building materials. 2.L
	Calculate CLTD (Cooling Load Temperature Difference). 2.M

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	n Make corrections for CLTD. 2.N
	o Calculate conduction loads for walls, roofs, windows, doors, non-conditioned space, and floors. 2.O
	p Calculate lighting load. 2.P
	q Determine the size of equipment needed. 2.Q
	r Calculate infiltration and ventilation. 2.R
	s Calculate duct gain. 2.S
Manual "D" Duct Design: 3	**a** Draw the layout of return and supply runs. 3.A
	b Calculate the equivalent length of trunk and branch ducts. 3.B
	c Calculate the total effective length of duct runs. 3.C
	d Calculate the total available static pressure. 3.D
	e Size trunk and branch ducts by equal friction method. 3.E
	f Use a duct calculator to find duct size, velocity, CFM, and friction loss. 3.F
	g Calculate air flow factors for heating and cooling. 3.G
	h Size registers, grills, and diffusers. 3.H
Air Filtration: 4	**a** Identify types of mechanical filters: disposable, permanent foam, mesh, fiber, and high efficiency. 4.A
	b Describe the operation of electronic air cleaners. 4.B