

Item	System	Unit Cost	Unit	Quantity	Cost
AHU	Existing	10,300.00	\$/AHU	6	61,800.00
Totals	Alt #1	25,900.00	\$/AHU	6	155,400.00
	Alt #2	25,900.00	\$/AHU	3	77,700.00
Piping					
6"	Existing	62.00	\$/ft	0	0.00
	Alt #1	62.00	\$/ft	637	39,494.00
	Alt #2	62.00	\$/ft	597	37,014.00
	Parallel	62.00	\$/ft	0	0.00
	FCU	63.00	\$/ft	0	0.00
4"	Existing	30.60	\$/ft	0	0.00
	Alt #1	30.60	\$/ft	0	0.00
	Alt #2	30.60	\$/ft	0	0.00
	Parallel	30.60	\$/ft	48	1,468.80
	FCU	31.60	\$/ft	48	1,516.80
2.5"	Existing	18.75	\$/ft	0	0.00
	Alt #1	18.75	\$/ft	0	0.00
	Alt #2	18.75	\$/ft	0	0.00
	Parallel	18.75	\$/ft	260	4,875.00
	FCU	19.75	\$/ft	0	0.00
2"	Existing	13.33	\$/ft	0	0.00
	Alt #1	13.33	\$/ft	0	0.00
	Alt #2	13.33	\$/ft	0	0.00
	Parallel	13.33	\$/ft	260	3,465.80
	FCU	14.33	\$/ft	520	7,451.60
1.5"	Existing	10.51	\$/ft	0	0.00
	Alt #1	10.51	\$/ft	0	0.00
	Alt #2	10.51	\$/ft	0	0.00
	Parallel	10.51	\$/ft	1120	11,771.20
	FCU	11.51	\$/ft	0	0.00
1.25"	Existing	9.35	\$/ft	0	0.00
	Alt #1	9.35	\$/ft	0	0.00
	Alt #2	9.35	\$/ft	0	0.00
	Parallel	9.35	\$/ft	1120	10,472.00
	FCU	10.35	\$/ft	2240	23,184.00
Piping Totals	Existing				0.00
	Alt #1				39,494.00
	Alt #2				37,014.00
	Parallel				32,052.80
	FCU				32,152.40
Pump					
Totals	Existing	0.00	\$/Pump	0	0.00
	Alt #1	5,576.00	\$/Pump	1	5,576.00
	Alt #2	4,869.20	\$/Pump	1	4,869.20
	Parallel Clg	3,700.00	\$/Pump	1	3,700.00
	Parallel Htg	2,912.50	\$/Pump	1	2,912.50
	FCU Htg	3,399.00	\$/Pump	1	3,399.00
Duct Totals	Existing	2.00	\$/sq. ft	88000	176,000.00
	Alt #1	2.00	\$/sq. ft	88000	176,000.00
	Alt #2	1.00	\$/sq. ft	88000	88,000.00

RS Means Code	Detail
300-1080	Central Station AHU "Ducted Evaporative Cooler"
200-2370	Central Station AHU Chilled Water 20000cfm
200-2370	Central Station AHU Chilled Water 20000cfm
620-0670	schedule 40 steel pipe
620-0650	schedule 40 steel pipe
620-0620	schedule 40 steel pipe
620-0610	schedule 40 steel pipe
620-0600	schedule 40 steel pipe
620-0590	schedule 40 steel pipe
Interpolated from RS-Means General Utility Pumps	same
Interpolated from RS-Means General Utility Pumps	same
Interpolated from RS-Means General Utility Pumps	same
Interpolated from RS-Means General Utility Pumps	same
Interpolated from RS-Means General Utility Pumps	same
Based on Dr. Mumma's Economic Considerations on doas-radiant.psu.edu assuming baseline of plain DOAS ductwork as VAV boxes will be figured separately	

VAV	Electric Heat	112.00	\$/box	662.5	74,200.00
Box	Hot Water Ht	112.00	\$/box	682.5	76,440.00
Totals	Box w/o Heat	48.00	\$/box	335	16,080.00
Beam	Trox				
Totals	Series AKV	500.00	\$/linear yd	468	234,000.00
kW of System Resultant Panelboards					
Electrical	Existing	2,565.00	423	2	5,130.00
Support	Alt #1	2,565.00	157.9	1	2,565.00
Equipment	Alt #2	2,100.00	54.9	1	2,100.00
	Parallel	1,260.00	3	1	1,260.00
	FCU	2,750.00	380	7	19,250.00
Steam -	Parallel	16,905.00	\$/unit	1	16,905.00
Water	FCU	12,775.00	\$/unit	1	12,775.00
HTX					
E-Wheel	Semco TE3-	20,000.00	\$/unit	3	60,000.00

700-5640 800cfm VAV box with electric heat
800cfm VAV box with hot water heat
350 cfm VAV box without heat

Based on similar system estimate from English manufacturer halton series CLO

800-0300 800Amp, 480V, Main distribution panelboard
800-0300 800Amp, 480V, Main distribution panelboard
800-0200 600Amp, 480V, Main distribution panelboard
720-1250 100Amp, 480Y/277, 12 Circuits MLO
720-1350 225Amp, 480Y/277, 12 Circuits MLO

Assembly	Existing VAV system with DX cooling	242,930.00
Totals	Alt #1 VAV system with chilled water cooling	379,035.00
	Alt #2 DOAS system with chilled water cooling	269,683.20
	Parallel System of Active Heated/Chilled Beams	290,830.30
	Existing VAV box system with electric reheat	109,530.00
	Existing VAV box system with hot water reheat	140,846.40

Combined	Existing system	352,460.00
Totals	Alt #1	519,881.40
	Alt #2	560,513.50