

Company Name

HVAC1 - Central Station VAV w/ Reheat
First Cost Estimate

Job No.
File Name:
Est. By:

Date:

Project:

Status of Design: DD

Client:

DESCRIPTION	QUANTITY		MATERIAL		APPROXIMATE		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL
Central Station VAV Air Handling Units w/ Heat Recovery:								
20,000 cfm AHU, EF, HW/CHW Coils, VFD's	1	ea					36,600	36,600
Medium Velocity Air Distribution System	20,000	cfm					2.15	43,000
15,000 cfm AHU, EF, HW/CHW Coils, VFD's	1	ea					27,960	27,960
Medium Velocity Air Distribution System	15,000	cfm					2.15	32,250
10,000 cfm AHU, EF, HW/CHW Coils, VFD's	1	ea					20,080	20,080
Medium Velocity Air Distribution System	10,000	cfm					2.15	21,500
Return Exhaust Duct system	45,000	cfm					2.95	132,750
VAV Reheat Fan Powered Terminal Boxes:								
2000 cfm, incl. piping, actuator and controls	12	ea					1,750	21,000
1600 cfm, incl. piping, actuator and controls	15	ea					1,575	23,625
1200 cfm, incl. piping, actuator and controls	7	ea					1,575	11,025
800 cfm, incl. piping, actuator and controls	4	ea					1,375	5,500
600 cfm, incl. piping, actuator and controls	5	ea					1,275	6,375
400 cfm, incl. piping, actuator and controls	8	ea					1,275	10,200
Rooftop Air Handling Unit (Cafeteria/Common):								
25 Ton Nominal Size, Incl Curb, HW/Ch / CW clg	1	ls					20,000	20,000
Rooftop Air Handling Unit (Library):								
15 Ton Nominal Size, Incl Curb, HW/Ch / CW clg	1	ls					12,000	12,000
Rooftop Air Handling Unit (Gymnasium):								
50 Ton Nominal Size, Incl Curb, HW/Ch / CW clg	1	ls					40,000	40,000
COOLING PLANT:								
Air Cooled Recip Chiller, 250 tons	1	ls					182,500	182,500

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Company Name

**HVAC1 - Central Station VAV w/ Reheat
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DESCRIPTION	QUANTITY		MATERIAL		APPROX		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL

HEATING PLANT:

Gas Hot Water Boiler - 84% EFF (3 MBTUH)	2	ea					25,500	51,000
Secondary Circ Pump and Assoc Piping	2	ls					2,500	5,000

HYDRONIC LOOP - Chilled Water:

Piping, 4" Avg Size, Grooved Joint, Uninsulated	800	lf					31.50	25,200
Pipe Insulation, 1/2" Fiberglass w/ ASJ	800	lf					13.35	10,680
Base Mounted Circ Pump Assmby, 750 gpm	1	ls					7,500	7,500
Expansion Tank	1	ea					2,350	2,350
Air Separator, Micro-Bubble Type w/ Dirt Collection	1	ea					6,800	6,800
Glycol Feeder	1	ls					2,500	2,500
Propylene Glycol (35% System Solution)	350	gal					12.85	4,498
Terminal Equipment Valves, Hose Kits, Fittings	6	ea					500	3,000

HYDRONIC LOOP - Heating Water:

Piping, 3" Avg Size, Grooved Joint, Uninsulated	800	lf					26.00	72,800
Pipe Insulation, 1-1/2" Fiberglass w/ ASJ	2,400	lf					14.60	40,880
Base Mounted Circ Pump Assmby, 450 gpm	2	ls					6,500	13,000
Expansion Tank	1	ea					2,350	2,350
Air Separator, Micro-Bubble Type w/ Dirt Collection	1	ls					4,700	4,700
Glycol Feeder	1	ls					2,500	2,500
Propylene Glycol (35% System Solution)	880	gal					12.85	11,308
Terminal Equipment Valves, Hose Kits, Fittings	40	ea					500	20,000

Additional Roof Structural Support	3	ls					3,750	11,250
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Total - HVAC1 - Central Station VAV w/ Reheat:

\$943,681

Estimate is based upon 2007 RS Means Cost data, equipment vendor quotes and professional experience.

Estimate includes 15% OH & P subcontractor markup and does not include items common to other alternatives analyzed.

Company Name

**HVAC2 - Water Source Heat Pumps
First Cost Estimate**

Job No.
File Name:
Est. By:

Date:

Project:

Status of Design: DD

Client:

DESCRIPTION	QUANTITY		MATERIAL		APPROX		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL

Water Source Heat Pumps:

6 Ton Nominal Size	3	ls					5,800	17,400
5 Ton Nominal Size	5	ls					4,800	24,000
4 Ton Nominal Size	21	ls					4,300	90,300
3 Ton Nominal Size	6	ls					3,600	21,600
2 Ton Nominal Size	5	ls					3,300	16,500

Energy Recovery Ventilation System:

3,750 cfm Enthalpy ERV - Incl Curb	2	ea					35,810	71,620
Ventilation Supply Terminal Box	40						375	15,000
Exhaust/Relief Terminal Box	28						375	10,500
Medium Velocity Ductwork	1	ls					15,500	15,500

Rooftop Air Handling Unit (Cafeteria/Commons):

25 Ton Nominal Size, Incl Curb, gas ht/DX elect clg	1	ls					40,000	40,000
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Rooftop Air Handling Unit (Library):

15 Ton Nominal Size, Incl Curb, gas ht/DX elect clg	1	ls					32,000	32,000
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Rooftop Air Handling Unit (Gymnasium):

50 Ton Nominal Size, Incl Curb, gas ht/DX elect clg	1	ls					75,000	75,000
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COOLING PLANT:

Cooling Loop Fluid Cooler, With Remote Pump	1	ls					52,000	52,000
CT Pump, Piping	1	ls					5,900	5,900
Chemical Treatment System	1	ls					1,875	1,875

HEATING PLANT:

Gas Hot Water Boiler - 96% EFF (1 MBTUH)	2	ea					18,500	37,000
Secondary Circ Pump and Assoc Piping	2	ls					2,500	5,000

(Continued On Next Sheet)

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**HVAC2 - Water Source Heat Pumps
First Cost Estimate**

Job No.
File Name:
Est. By:

Date:

Project:

Status of Design: DD

Client:

DESCRIPTION	QUANTITY		MATERIAL		APPROXIMATE		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL

HYDRONIC LOOP:

Piping, 4" Avg Size, Grooved Joint, Uninsulated	2,500	lf					31.15	77,875
Base Mounted Circ Pump Assmby, 450 gpm	2	ls					5,900	11,800
Expansion Tank	1	ea					2,350	2,350
Air Separator, Micro-Bubble Type w/ Dirt Collection	1	ls					4,700	4,700
Terminal Equipment Valves, Hose Kits, Fittings	40	ea					500	20,000
Electrical Service - Distributed 460V Power System (Additional cost with respect to central station VAV)	1	ls					8,500	8,500

Total - HVAC2 - WSHP's:

\$656,420

Estimate is based upon 2007 RS Means Cost data, equipment vendor quotes and professional experience.
Estimate includes 15% OH & P subcontractor markup and does not include items common to other alternatives analyzed.

Company Name

**HVAC1 - Central Station VAV w/ Reheat
Replacement & Repair Cost Estimate**

Job No.
File Name:
Est. By:

Date:

Project:

Status of Design: DD

Client:

DESCRIPTION	QUANTITY		MATERIAL		APPROX		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL

Replace Equipment at 15 Year Interval:

Central Station Air Handling Unit:

20,000 cfm AHU, EF, HW/CHW Coils, VFD's	1	ea					42,090	42,090
15,000 cfm AHU, EF, HW/CHW Coils, VFD's	1	ea					32,154	32,154
10,000 cfm AHU, EF, HW/CHW Coils, VFD's	1	ea					23,092	23,092

VAV Reheat Fan Powered Terminal Boxes:

2000 cfm, incl. piping, actuator and controls	12	ea					2,013	24,150
1600 cfm, incl. piping, actuator and controls	15	ea					1,811	27,169
1200 cfm, incl. piping, actuator and controls	7						1,811	12,679
800 cfm, incl. piping, actuator and controls	4						1,581	6,325
600 cfm, incl. piping, actuator and controls	5	ea					1,466	7,331
400 cfm, incl. piping, actuator and controls	8	ea					1,466	11,730

Rooftop Air Handling Unit (Cafeteria/Commons):

25 Ton Nominal Size, Incl Curb, HW ht / CW clg	1	ls					23,000	23,000
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Rooftop Air Handling Unit (Library):

15 Ton Nominal Size, Incl Curb, HW ht / CW clg		ls					13,800	13,800
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Rooftop Air Handling Unit (Gymnasium):

50 Ton Nominal Size, Incl Curb, HW ht / CW clg	1	ls					46,000	46,000
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Total Replacement - 15 year Intervals:

\$269,520

Replace Equipment at 20 Year Interval:

Base Mounted Circ Pump (HW & CHW Systems)	3	ea					7,900	23,700
Air Cooled Recip Chiller, 250 tons	1	ea					219,000	219,000

Total - 20 Year Replacement:

\$242,700

Replace Equipment at 30 Year Interval:

Remove & Replace Gas Hot Water Boiler	2	ea					33,150	66,300
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Company Name

**HVAC1 - Central Station VAV w/ Reheat
Replacement & Repair Cost Estimate**

Job No.
File Name:
Est. By:

Date:

Project:

Status of Design: DD

Client:

DESCRIPTION	QUANTITY		MATERIAL		APPROXIMATE		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL
Repair Equipment at 5 Year Interval:								
Base Mounted Circ Pump	3	ea					125	\$375
Repair Equipment at 7 Year Interval:								
Gas Hot Water Boiler	2	ea					3,360	\$6,720
Repair Equipment at 10 Year Interval:								
VAV Reheat Fan Powered Terminal Boxes:								
2000 cfm, incl. piping, actuator and controls	12	ea					118	1,416
1600 cfm, incl. piping, actuator and controls	15						75	1,125
1200 cfm, incl. piping, actuator and controls	7						75	525
800 cfm, incl. piping, actuator and controls	4	ea					48	192
600 cfm, incl. piping, actuator and controls	5	ea					48	240
400 cfm, incl. piping, actuator and controls	2	ea					48	384
Air Cooled Recip Chiller, 250 ton	1	ea					48,349	48,349
Packaged Rooftop Unit, HW/CW: 15 to 25 Ton Nominal Size		ls					1,450	2,900
Packaged Rooftop Unit, HW/CW: 50 Ton Nominal Size	1	ls					2,200	2,200
Central Station Air Handling Unit	3	ls					1,450	4,350
Total - 10 Year Repair:								\$61,681

This estimate is based upon 2006 RS Means Facilities Maintenance and Repair Cost Data and assumes that work is performed by a contractor hired by the school district.

Company Name

**HVAC2 - Water Source Heat Pumps
Replacement & Repair Cost Estimate**

Job No.
File Name:
Est. By:

Date:

Project:

Status of Design: DD

Client:

DESCRIPTION	QUANTITY		MATERIAL		APPROXIMATE COST		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL

Replace Equipment at 15 Year Interval:

Rooftop Air Handling Unit (Cafeteria/Commons):

25 Ton Nominal Size, Incl Curb, gas ht/DX elect clg 1 ls 46,000 46,000

Rooftop Air Handling Unit (Library):

15 Ton Nominal Size, Incl Curb, gas ht/DX elect clg 1 ls 36,800 36,800

Rooftop Air Handling Unit (Gymnasium):

50 Ton Nominal Size, Incl Curb, gas ht/DX elect clg 1 ls 86,250 86,250

Total - 15 Year Replacement:

\$123,050

Replace Equipment at 19 Year Interval:

Remove & Replace WSHP (6 Ton Nominal Size) 3 ls 6,960 20,880

Remove & Replace WSHP (5 Ton Nominal Size) 5 ls 5,760 28,800

Remove & Replace WSHP (4 Ton Nominal Size) 21 ls 5,160 108,360

Remove & Replace WSHP (3 Ton Nominal Size) 6 ls 4,320 25,920

Remove & Replace WSHP (2 Ton Nominal Size) 5 ls 3,960 19,800

Total - 19 Year Replacement:

\$203,760

Replace Equipment at 20 Year Interval:

Remove & Replace Energy Recovery Unit 2 ea 42,972 85,944

Base Mounted Circ Pump 3 ea 7,080 21,240

Cooling Tower 1 ea 62,400 62,400

Total - 20 Year Replacement:

\$169,584

Replace Equipment at 30 Year Interval:

Remove & Replace Gas Hot Water Unit 2 ea 24,050 **48,100**

Repair Equipment at 5 Year Interval:

Base Mounted Circ Pump 3 ea 125 **\$375**

Repair Equipment at 7 Year Interval:

Company Name

**HVAC2 - Water Source Heat Pumps
Replacement & Repair Cost Estimate**

Job No.
File Name:
Est. By:

Date:

Project:

Status of Design: DD

Client:

DESCRIPTION	QUANTITY		MATERIAL		APPROXIMATE		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL
Gas Hot Water Boiler		2 ea					3,360	\$6,720

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Repair Equipment at 10 Year Interval:

Water Source Heat Pumps

WSHP (6 Ton Nominal Size)	3	ls					3,505	10,515
WSHP (5 Ton Nominal Size)	5	ls					2,630	13,150
WSHP (4 Ton Nominal Size)	21	ls					2,192	46,032
WSHP (3 Ton Nominal Size)	6	ls					2,192	13,152
WSHP (2 Ton Nominal Size)	5	ls					1,928	9,640

Cooling Tower	1	ea					4,693	4,693
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Packaged Rooftop Unit, gas ht/DX elect clg: 15 to 25 Ton Nominal Size	2	ea					12,616	25,232
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Packaged Rooftop Unit, gas ht/DX elect clg: 50 Ton Nominal Size	1	ls					18,125	18,125
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Energy Recovery Units	2	ls					3,650	7,300
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Total - 10 Year Repair:

\$147,839

This estimate is based upon 2006 Mean Facilities Maintenance and Repair Cost Data and assumes that work is performed by a contractor hired by the school district.

Company Name

**HVAC1 - Central Station VAV w/ Reheat
Maintenance Cost Estimate**

Job No.
File Name:
Est. By:

Date:

Project:

Status of Design: DD

Client:

DESCRIPTION	QUANTITY		MATERIAL		APPROXIMATE		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL
Gas Hot Water Boiler	2	ea					1,150	2,300
VAV Terminal	51	ea					76	3,876
Base Mounted Circ Pump	3	ea					108	324
Air Cooled Recip Chiller, 250 ton	1	ea					635	635
Central Station Air Handling Unit	3	ea					645	1,935
Packaged Rooftop Gas/Electric Rooftop Unit: for units < 24 Ton Nominal	2	ea					262	524
Packaged Rooftop Gas/Electric Rooftop Unit: for units > 24 Ton Nominal	2	ea					625	1,250
Total Annualized Maintenance:								\$10,844

This estimate is based upon 2006 RS Means Facilities Maintenance and Repair Cost Data and assumes that work is performed by the school district maintenance staff.

Company Name

**HVAC2 - Water Source Heat Pumps
Maintenance Cost Estimate**

Job No.
File Name:
Est. By:

Date:

Project:

Status of Design: DD

Client:

DESCRIPTION	QUANTITY		MATERIAL		APPROXIMATE		ENGINEERING EST.	
	NO.	UNITS	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL
Gas Hot Water Boiler	2	ea					1,150	2,300
Energy Recovery Ventilator	2	ea					350	700
WSHP - Over 5 tons Nominal Size	8	ea					235	1,880
WSHP - Up to 5 tons Nominal Size	32	ea					228	7,296
Base Mounted Circ Pump	3	ea					108	324
Cooling Tower	1						585	585
Packaged Rooftop Gas/Electric Rooftop Unit: for units < 24 Ton Nominal	2	ea					262	524
Packaged Rooftop Gas/Electric Rooftop Unit: for units > 24 Ton Nominal	2	ea					625	1,250
Total Annualized Maintenance:								\$14,859

This estimate is based upon 2006 RS Means Facilities Maintenance and Repair Cost Data and assumes that work is performed by the school district maintenance staff.