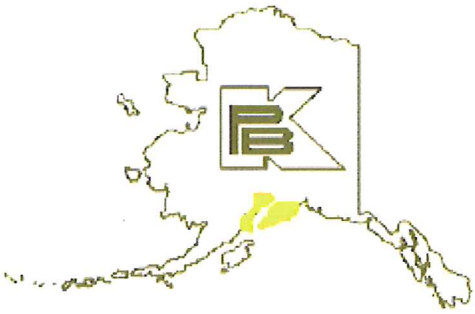


KENAI PENINSULA BOROUGH

Borough Administration Building

IT Server Room AC Replacement Study

AMC Engineers

701 East Tudor Road, Suite 250

Anchorage, Alaska 99503

May 13, 2009

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This study was conducted to address deficiencies with the cooling system for the IT server computer room at the Kenai Peninsula Borough Administration Building in Soldotna, Alaska. The study included a site visit to the building and meetings with KPB maintenance and IT staff. The study resulted in the following determinations:

1. The IT server room is cooled by a single AC unit that rejects heat to the city water utility. Interruptions in city water utility service result in shutdown of the IT server room cooling system and compromises operation of the computer room.
2. The cooling system equipment was installed in 1984 and has reached the end of its useful life. The AC unit manufacturer no longer exists and replacement parts are increasingly unavailable.
3. The IT server room is a critical computer center that carries 80% of the Kenai Peninsula Borough administrative communications traffic, including Borough wide service to Seward and Homer.

Recommendation:

Install six 3.5 ton ceiling mounted AC units as the primary cooling system for the facility. Replace the existing 20 ton floor mounted AC unit with a new floor mounted 20 ton AC unit, utilizing city water as a source of cooling, as a backup system for the ceiling mounted units.

The preliminary construction cost estimate (appendix 1) for replacement of the cooling system is: **$347,695.**

The construction cost estimate is reflective of a 2009 construction schedule. If the construction schedule is changed then an appropriate escalation factor should be applied.

The project's soft costs need to be added in over and above the construction costs to arrive at a total project cost.

DISCUSSION

IT Server Room Mission

The IT server room computers support 80% of the Kenai Peninsula Borough communication traffic, including Borough services in Seward and Homer. The Borough administrative telephone service uses Voice over Internet Protocol (VoIP) which is supported by the servers in this facility. The public phone communication interface with the Borough administrative offices is also carried by these servers. The IT server room is mission critical to the administrative services provided by the Kenai Peninsula Borough.

Existing Server Room Cooling System Deficiencies

The existing server room AC unit was installed in 1984 and has reached the end of its useful life. It has been rebuilt once but the original manufacturer no longer exists and replacement parts are increasingly unavailable.

The existing AC unit utilizes domestic water from the city utility service for heat rejection. This system is subject to interruptions with the city water service and may be particularly vulnerable to damage to the city utility as a result of seismic activity. The operation of the AC unit ceases when city water service is not available.

Photos of the existing AC unit, city water heat exchanger and server room are located in appendix 2 of this study.

AC Unit Replacement Construction Schedule Coordination

The AC unit replacement construction impact on the server room operation is an important consideration. The replacement must be completed without interrupting the KPB administrative communication systems. It is proposed that the existing floor mounted AC unit be left operational while the new ceiling mounted AC units are installed. When the new ceiling mounted AC units are proven operational, the existing floor mounted AC unit would be removed and replaced with the new floor mounted AC unit.

RECOMMENDATIONS

Install six 3.5 ton ceiling mounted AC units as the primary cooling system for the facility. Replace the existing 20 ton floor mounted AC unit with a new floor mounted 20 ton AC unit, utilizing city water as a source of cooling, as a backup system for the ceiling mounted units.

Provide a new power distribution panel and power connections to serve the new AC units.

Technical data for the new ceiling mounted AC units and condensers and the floor mounted backup unit is included in appendix 3.

Schematic drawings showing the proposed layout and piping diagram for the new system are contained in appendix 4.

APPENDIX 1

COST ESTIMATE

AMC ENGINEERS

Administration Building IT Server AC Replacement

Kenai Peninsula Borough
Kenai, Alaska

Construction Cost Estimate
Concept Submittal
May 13, 2009

ESTIMATIONS
1225 E. International Airport Road, Suite 205
Anchorage, Alaska 99518
907.561.0790

Prepared for:
AMC Engineers
701 East Tudor Road, Suite 250
Anchorage, Alaska 99503
907.257.9100

Administration Building IT Server AC Replacement
Kenai Peninsula Borough
Prepared for AMC Engineers by Estimations

Construction Cost Estimate
Concept Submittal
May 13, 2009

Documents

Drawings Dated 29 Apr 2009, Email notes

Notes and Assumptions

1 Based on 2009 costs escalated to 2009 construction.
2 Labor rates based on Davis Bacon, 50 hours/week.
3 Weather, logistics and construction time window has been considered.
4 Assumes open competitive bid procurement.
5 Materials storage area will be designated near the building.
6 Local contractor with limited room and board.

Administration Building IT Server AC Replacement | **Construction Cost Estimate**
Kenai Peninsula Borough | **Concept Submittal**
Prepared for AMC Engineers by Estimations | **May 13, 2009**

Description					Estimated Cost
Basic Bid					
GENERAL REQUIREMENTS					$61,433
ARCHITECTURAL & STRUCTURAL					$12,490
MECHANICAL					$189,052
ELECTRICAL					$33,497
Subtotal:					**$296,472 <<<<<**
Estimating Contingency:				15.0%	$44,471
Escalation For Inflation: (2009)	6 Mths	@	4.0%	2.0%	$6,752
Total Estimated Cost - Basic Bid:					**$347,695 <<<<<**

Administration Building IT Server AC Replacement | **Construction Cost Estimate**
Kenai Peninsula Borough | **Concept Submittal**
Prepared for AMC Engineers by Estimations | **May 13, 2009**

Line No.	Description	Qty	UNITS	Material Costs Unit	Material Costs Total	Labor Hours Units	Labor Hours Totals	Labor Cost	Equip Cost	Total Cost	Total Cost w/ OH & P
1	**GENERAL REQUIREMENTS**										
2											
3	**Project Management**										
4	Project Manager, 16 Hour/Week	3	WEEKS			16.000	48.0	$3,696		$3,696	$3,696
5	Supervisor, 50 Hour/Week	2	WEEKS			50.000	100.0	$5,500		$5,500	$5,500
6	Project Expeditor, 8 Hour/Week	2	WEEKS			8.000	16.0	$1,091		$1,091	$1,091
7											
8	**Subsistence**										
9	Room & Board - Special Crews	26	MANDAY	$140.00	$3,680					$3,680	$3,680
10											
11	**Travel**										
12	Air Fare - Anchorage - Site	1	EA	$210.00	$210					$210	$210
13											
14	**Small Tools & Consumables**										
15	Consumables	1	LS	$300.00	$300					$300	$300
16	Small Tools	1	LS	$590.00	$590					$590	$590
17											
18	**Equipment**										
19	Pickup (2 Ea)	2	WEEKS						$933	$933	$933
20	Forklift (1 Ea)	2	WEEKS						$1,333	$1,333	$1,333
21	Flatbed (1 Ea)	2	WEEKS						$1,000	$1,000	$1,000
22											
23	**Other Requirements**										
24	Project Meetings	2	EA			4.000	8.0	$308		$308	$308
25	Shop Drawings	30	HRS			1.000	30.0	$1,155		$1,155	$1,155
26	Quality Control	1	LS	$1,000.00	$1,000	40.000	40.0	$1,540		$2,540	$2,540
27	Test Lab Services	1	LS	$2,500.00	$2,500					$2,500	$2,500
28											
29	**General Contractor Overhead**	6%									$15,593
30	**General Contractor Profit (Fee)**	5%									$13,773
31	**General Contractor Bond & Insurance**	2.5%									$7,231
32											
33	**Subtotal: GENERAL REQUIREMENTS**				$8,280		242.0	$13,290	$3,267	$24,837	**$61,433**
34											
35											

Line No.	Description	Qty	UNITS	Material Costs Unit	Material Costs Total	Labor Hours Units	Labor Hours Totals	Labor Cost	Equip Cost	Total Cost	Total Cost w/ OH & P
36	**ARCHITECTURAL & STRUCTURAL**										
37	Cut, Patch And Repair Ext Wall At Pipe Penetrations	1	LS	$200.00	$200	6.000	6.0	$415		$615	$615
38	Structural Supports For Condensing Units, Assumes Two Steel Knee Braces Per Unit	6	EA	$350.00	$2,100	10.000	60.0	$4,147		$6,247	$6,247
39	Cut, Patch And Repair Partitions, Structural Members At Pipe Penetrations, Fire Stopping - Allowance	1	LS	$1,000.00	$1,000	40.000	40.0	$2,765		$3,765	$3,765
40	Remove & Replace Ceiling, Patch, Repair, Paint To Match Existing	250	SF	$3.50	$875	0.057	14.3	$988		$1,863	$1,863
41											
42	**Subtotal: ARCHITECTURAL & STRUCTURAL**				$4,175		120.3	$8,315		$12,490	**$12,490**
43											
44											
45											
46	**MECHANICAL**										
47	**15010 General Conditions**										
48	Field Engineering: Submittals, Shop & Record Dwgs, Operating Instructions, O&M	40	HRS	$5.00	$200	1.000	40.0	$1,540		$1,740	$1,740
49	Allowance For Phasing. Existing System Must Remain Operational Throughout. 15%	1	LS			140.000	140.0	$9,494		$9,494	$12,342
50	Tests, Inspections	1	LS	$100.00	$100	28.571	28.6	$1,951		$2,051	$2,051
51	Supervision, Part Time	2	WEEKS			20.000	40.0	$2,200	$125	$2,325	$2,325
52	Materials Control, Part Time	2	WEEKS			20.000	40.0	$880	$138	$1,018	$1,018
53	Temporary Connections	1	LS	$1,000.00	$1,000	40.000	40.0	$2,728		$3,728	$3,728
54	Bond and Insurance (1%)	1	LS	$1,900.00	$1,900					$1,900	$1,900
55	Tools and Equipment (1% of Labor)	1	LS						$300	$300	$300
56	Seismic & Vibration Control	1	LS	$5,000	$5,000					$5,000	$5,000
57											
58	**Demolition**										
59	Demo Existing 20T AC Unit Incl Water Cooled Condensing Unit, Misc Associated Specialties, Prep For Reconnection To New 20T Replacement Unit	1	LS			24.000	24.0	$1,628		$1,628	$2,116
60											

Line No.	Description	Qty	UNITS	Material Costs Unit	Material Costs Total	Labor Hours Units	Labor Hours Totals	Labor Cost	Equip Cost	Total Cost	Total Cost w/ OH & P
61	**15080 Mechanical Insulation**										
62	**Piping Insulation**										
63	Replace Existing Piping Insulation -- Allowance For Misc Remodel Work	1	LS	$200.00	$200	4.000	4.0	$287		$487	$706
64											
65	**15140 Plumbing Piping, CW & DWV**										
66	Connect Condensing Unit to CW System										
67	2" Pipe, Fittings, Copper Type L	30	LF	$25.45	$764	0.219	6.6	$448		$1,212	$1,576
68	2" Backflow Preventer	1	EA	$1,400.00	$1,400	1.500	1.5	$102		$1,502	$1,953
69	2" Drain -- Tie in to DWV System	1	EA	$1,000.00	$1,000	4.000	4.0	$271		$1,271	$1,652
70	Allowance For Misc Piping, Fittings, Valves, Specialties	1	LS	$2,000.00	$2,000	12.000	12.0	$814		$2,814	$3,658
71											
72	**15734 Computer-Room Air-Conditioning Units**										
73	Vendor Quote Including (6) 3.5 Ton AC Units, Complete pkg, Including Condensing Units and Line Sets	1	LS	$53,600.00	$53,600	48.000	48.0	$3,255		$56,855	$73,912
74											
75	Vendor Quote For 20T Replacement Unit	1	EA	$37,500.00	$37,500	20.000	20.0	$1,356		$38,856	$50,513
76											
77	**15900 HVAC Instrumentation and Controls**										
78	Interface New AC Units With Existing Control System, Alarms, Notification - Allowance	1	LS	$10,000.00	$10,000					$10,000	$14,500
79											
80	**15950 Testing, Adjusting, and Balancing**										
81	Balancing, Adjusting, Commissioning,	1	LS			80.000	80.0	$5,560		$5,560	$8,062
82											
83											
84											
85											
86	**Subtotal: MECHANICAL**				$114,664		528.7	$32,514	$563	$147,741	**$189,052**
87											
88											
89											

Line No.	Description	Qty	UNITS	Material Costs Unit	Material Costs Total	Labor Hours Units	Labor Hours Totals	Labor Cost	Equip Cost	Total Cost	Total Cost w/ OH & P
90	**ELECTRICAL**										
92	**16010 Basic Electrical Requirements**										
93	Field Engineering: Submittals, Shop & Record										
94	Dwgs, Operating Instructions, O&M Manuals	16	HRS	$5.00	$80	1.000	16.0	$616		$696	$696
95	Permits, Tests, Inspections	1	LS	$100.00	$100	40.000	40.0	$2,728		$2,828	$2,828
96	Supervision	1	WEEKS			20.000	20.0	$1,100	$63	$1,163	$1,163
97	Materials Control	1	WEEKS			20.000	20.0	$440	$69	$509	$509
98	Bond and Insurance	1	LS	$300.00	$300					$300	$300
99	Tools and Equipment	1	LS						$100	$100	$100
100											
101	**16055 Electrical Demolition**										
102	Disconnect Existing AC Equipment, Reconnect to New	1	LS	$100.00	$100	6.000	6.0	$426		$526	$710
103											
104	**16420 Enclosed Controllers**										
105	Starter/Disconnects 3 HP	6	EA	$740.00	$4,440	4.000	24.0	$1,702		$6,142	$8,292
106	3/4" EMT, 3#10, 1#10	450	LF	$2.77	$1,247	0.094	42.3	$3,000		$4,247	$5,733
107											
108	**16442 Panelboards**										
109	Panelboards, 480V, 3 Phase, 200A	1	EA	$3,500.00	$3,500	16.000	16.0	$1,135		$4,635	$6,257
110	Modify Existing Switchgear, Add Distribution Breaker For New Equipment Panel	1	EA	$3,500.00	$3,500	12.000	12.0	$851		$4,351	$5,874
111											
112	**16511 Interior Lighting**										
113	Remove & Replace Fixtures As Required - Allowance	1	LS	$200.00	$200	8.000	8.0	$567		$767	$1,035
114											
115											
116											
117											
118	**Subtotal: ELECTRICAL**				$13,467		204.3	$12,565	$231	$26,263	**$33,497**
119											
120											

APPENDIX 2

PHOTOS

Photo 1: Existing IT Server Room AC Unit

Photo 2: IT Server Room

Photo 3: Existing IT Server Room AC Unit Water Cooled Condensing Unit

Photo 4: Proposed Location for New Condensing Units on Building Wall

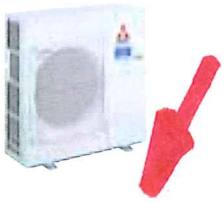
APPENDIX 3

TECHNICAL DATA

AMC ENGINEERS

SPECIFICATIONS FOR PC COOLING-ONLY
P-SERIES (R410A)

INVERTER



BS = Seacoast Protection

Model Name	Indoor Unit		PCA-A24GA	PCA-A30GA	PCA-A36GA	PCA-A42GA
	Outdoor Unit		PUY-A24NHA PUY-A24NHA-BS	PUY-A30NHA PUY-A30NHA-BS	PUY-A36NHA PUY-A36NHA-BS	PUY-A42NHA PUY-A42NHA-BS
Cooling *1	Rated Capacity	Btu/h	24,000	30,000	35,000	42,000
	Capacity Range	Btu/h	12,000-24,000	12,000-30,000	12,000-35,000	18,000-42,000
	Total Input	W	2,500	4,100	4,630	5,070
	Energy Efficiency	SEER	13.4	13	13.1	13.8
	Moisture Removal	Pints/h	5.4	8.3	8.2	11.7
	Sensible Heat Factor		0.75	0.69	0.74	0.69
Power supply	Phase, Cycle, Voltage		1 Phase, 60Hz, 208/230V			
	Breaker Size	A	25	30		
Voltage	Indoor - Outdoor S1-S2		AC 208/230V			
	Indoor - Outdoor S2-S3		DC24V			
	Indoor - Remote Controller		DC12V : Wired Type			
Indoor Unit	MCA	A	1			
	MOCP	A	15			
	Fan Motor	F.L.A.	0.53		0.69	
	Fan Motor Output	W	70		90	
	Airflow (Lo-M1-M2-Hi)	DRY (CFM)	495-530-565-635		705-740-810-880	
		WET (CFM)	445-480-510-570		635-670-730-790	
	Sound Level (Lo-M1-M2-Hi)	dB(A)	37-39-41-43		40-41-43-45	
	External Finish Color		Munsell 0.70Y 8.59/0.97			
	Dimension Unit	W: inch	51-9/16			
		D: inch	26-3/4			
		H: inch	8-3/10		10-5/8	
	Weight Unit	lbs.	75		82	
	Field Drain Pipe Size O.D.	inch	1			
Outdoor Unit	MCA	A	18	25		26
	MOCP	A	30	40		
	Fan Motor	F.L.A.	0.75			0.4 + 0.4
	Fan Motor Output	W	75			86 + 86
	Compressor		TNB220FLDM			ANV33FDDMT
		R.L.A	12			20
		L.R.A.	14	17.5		27.5
	Airflow	CFM	1,940			3,530
	Refrigerant Control		Linear Expansion Valve			
	Sound Level at Cooling *1	dB(A)	48			51
	External Finish Color		Munsell 3Y 7.8/1.1			
	Dimensions	W: inch	37-3/8			
		D: inch	13 + 1-3/16			
		H: inch	37-1/8			53-1/8
	Weight	lbs.	163			265
Remote Controller			Wired Remote Controller Located with Indoor Unit			
Refrigerant	Type		R410A			
	Charge	lbs.	6			10
	Oil	Type (fl. oz.)	MEL56 (28)			MEL56 (45)
Refrigerant Pipe	Gas Side O.D.	inch	5/8			
	Liquid Side O.D.	inch	3/8			
Refrigerant Pipe Length	Height Difference		Max.100 ft.			
	Length		Max.165 ft.			
Connection Method			Flared			

NOTES:
*1 Rating conditions (cooling)-Indoor: D.B. 26.7° C (80° F), W.B. 19.4° C (67° F) Outdoor: D.B. 35° C (95° F), W.B. 23.9° C (75° F).
Specifications are subject to change without notice.

Available Options
- **Wireless Remote Controller Kit**
- **Wind Baffle**

LIMITED WARRANTY | Six-year warranty on compressor. One-year warranty on parts.

Precision Cooling
For *Business-Critical Continuity™*

Liebert® DS™

System Design Manual - 28-105kW (8-30 Tons), Downflow/Upflow, 60Hz
Floor Mounted, Air-Cooled, Water/Glycol-Cooled, GLYCOOL, Dual-Cool

EMERSON™
Network Power

Table 4 Water-cooled capacity data, R-407C refrigerant

Model Size	028	035	042	053	070	077	105
FOUR-STEP SEMI-HERMETIC COMPRESSOR							
Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	39.7 (135.6)	39.6 (135.1)	47.4 (161.9)	57.7 (196.8)	71.5 (244.0)	82.1 (280.3)	103.8 (354.4)
Sensible kW (BTUH)	29.4 (100.5)	32.2 (109.9)	38.0 (129.6)	47.2 (161.2)	56.7 (193.5)	64.0 (218.3)	83.0 (283.3)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	38.6 (131.6)	38.9 (132.6)	46.2 (157.7)	56.4 (192.5)	69.3 (236.5)	79.8 (272.5)	101.0 (344.6)
Sensible kW (BTUH)	31.2 (106.5)	34.6 (118.1)	40.7 (138.9)	50.6 (172.8)	60.5 (206.6)	68.4 (233.6)	89.0 (303.9)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	37.9 (129.4)	37.9 (129.5)	45.2 (154.3)	55.4 (189.0)	68.1 (232.5)	78.3 (267.1)	99.1 (338.3)
Sensible kW (BTUH)	28.9 (98.6)	31.6 (107.9)	37.2 (126.8)	46.4 (158.2)	84.8 (289.4)	62.6 (213.7)	81.3 (277.6)
DIGITAL SCROLL COMPRESSOR (std scroll on 077 & 105 models)							
Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	31.8 (108.5)	37.8 (128.9)	42.7 (145.9)	58.6 (200.0)	73.4 (250.6)	81.9 (279.6)	102.7 (350.4)
Sensible kW (BTUH)	26.2 (89.3)	31.5 (107.5)	36.1 (123.1)	47.6 (162.5)	57.5 (196.2)	63.9 (218.0)	82.2 (280.6)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	30.8 (105.2)	36.7 (125.2)	41.7 (142.4)	57.2 (195.3)	71.3 (243.2)	79.6 (271.6)	99.7 (340.2)
Sensible kW (BTUH)	27.9 (95.3)	33.7 (115.0)	38.8 (132.5)	51.0 (174.0)	61.4 (209.5)	68.4 (233.3)	88.1 (300.7)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	30.4 (103.7)	36.2 (123.4)	39.5 (134.9)	56.1 (191.3)	69.9 (238.5)	78.1 (266.4)	97.7 (333.6)
Sensible kW (BTUH)	25.6 (87.4)	30.9 (105.3)	35.3 (120.5)	46.7 (159.3)	56.3 (192.0)	62.5 (213.4)	80.4 (274.4)

Capacity data is factory-certified to be within 5% tolerance.

Table 5 Water-cooled capacity data, R-22 refrigerant

Model Size	028	035	042	053	070	077	105
FOUR-STEP SEMI-HERMETIC COMPRESSOR							
Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	38.7 (132.2)	39.4 (134.4)	46.2 (157.6)	57.0 (194.4)	69.5 (237.3)	80.1 (273.4)	104.0 (354.8)
Sensible kW (BTUH)	29.7 (101.4)	32.7 (111.6)	37.9 (129.2)	47.8 (163.0)	56.4 (192.6)	63.4 (216.5)	82.7 (282.4)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	37.9 (129.2)	39.3 (134.2)	44.8 (152.8)	55.4 (189.0)	67.7 (230.9)	78.0 (266.1)	100.9 (344.3)
Sensible kW (BTUH)	31.7 (108.2)	32.7 (111.5)	40.5 (138.3)	51.1 (174.5)	60.4 (206.3)	68.0 (232.0)	88.7 (302.7)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	37.2 (126.8)	37.4 (127.7)	44.0 (150.3)	54.5 (186.1)	66.5 (227.1)	76.9 (262.4)	99.1 (338.2)
Sensible kW (BTUH)	29.2 (99.7)	31.9 (109.0)	37.0 (126.3)	46.8 (159.7)	55.3 (188.9)	62.3 (212.6)	81.0 (276.3)
DIGITAL SCROLL COMPRESSOR (Std Scroll on 077 & 105 Models)							
Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	31.1 (106.3)	36.7 (125.3)	42.7 (145.8)	58.6 (200.0)	73.2 (249.8)	80.5 (274.9)	100.8 (343.9)
Sensible kW (BTUH)	26.6 (90.8)	31.6 (107.9)	36.4 (124.4)	48.4 (165.3)	58.0 (197.8)	63.6 (217.1)	81.8 (279.1)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	30.5 (104.0)	35.4 (120.7)	41.5 (141.8)	57.1 (194.8)	71.3 (243.3)	78.4 (267.6)	97.9 (334.3)
Sensible kW (BTUH)	28.5 (97.4)	35.4 (120.7)	39.2 (133.7)	51.8 (176.9)	62.0 (211.6)	68.2 (232.7)	87.8 (299.6)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	29.9 (102.0)	35.2 (120.0)	40.8 (139.2)	56.1 (191.4)	70.1 (239.2)	77.2 (263.5)	96.2 (328.2)
Sensible kW (BTUH)	26.1 (89.0)	31.0 (105.7)	35.6 (121.6)	47.4 (161.9)	56.8 (194.0)	62.4 (213.1)	80.0 (273.1)

Capacity data is factory-certified to be within 5% tolerance.

DOWNFLOW, WATER/GLYCOL/GLYCOOL, 53-77KW (15-22 TON)—ALL COMPRESSORS

Figure 18 Dimensions - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

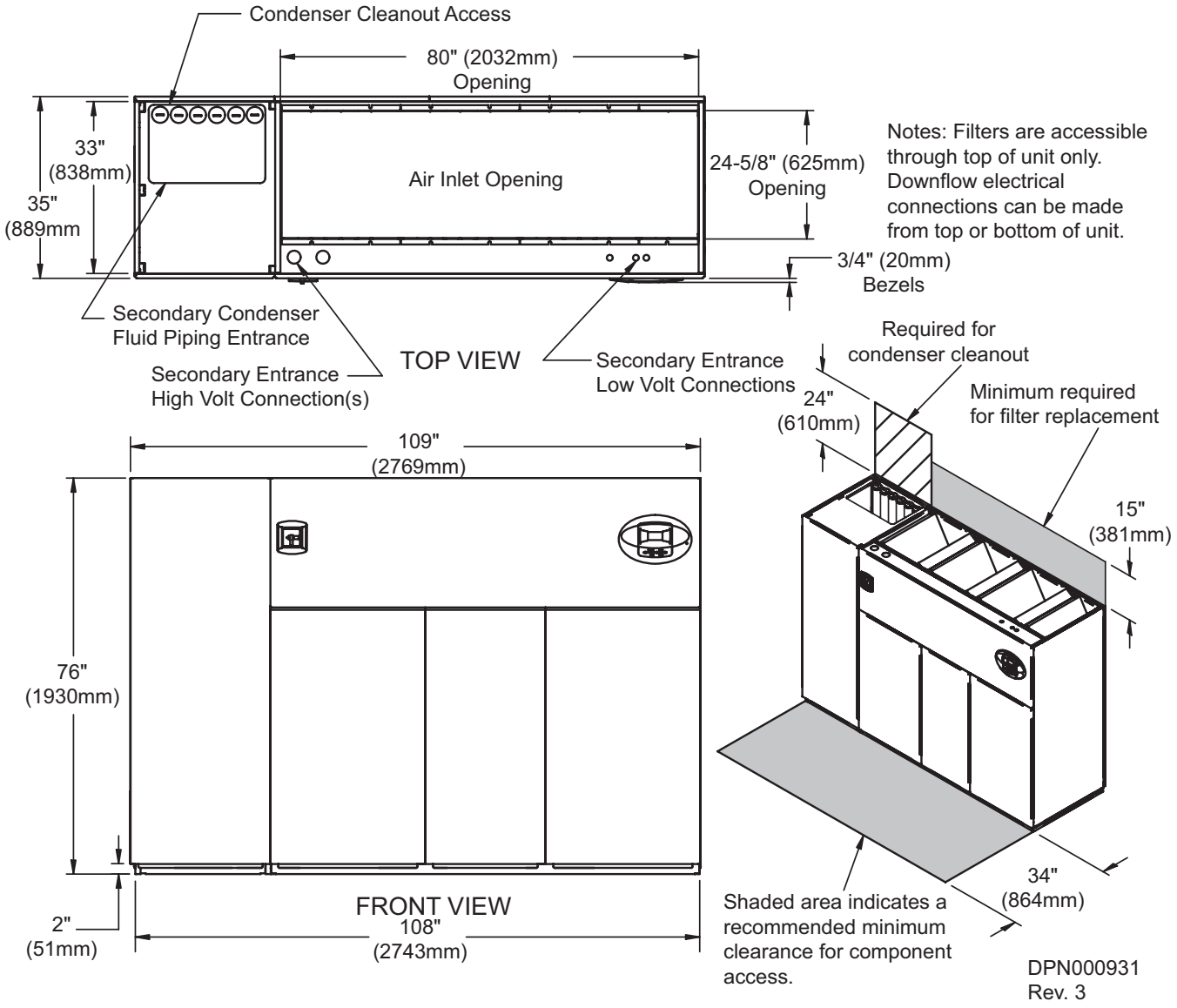


Table 29 Weights - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

Dry Weight, Approximate, lb. (kg)				
		Model Size		
Model Type		053	070	077
Semi-Hermetic Compressor	Water/Glycol	2650 (1205)	2700 (1228)	2750 (1250)
	GLYCOOL/Dual-Cool	2830 (1287)	2880 (1310)	2930 (1332)
Scroll or Digital Scroll Compressor	Water/Glycol	2220 (1010)	2270 (1032)	2320 (1055)
	GLYCOOL/Dual-Cool	2400 (1091)	2450 (1114)	2500 (1137)

Figure 19 Primary connection locations - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

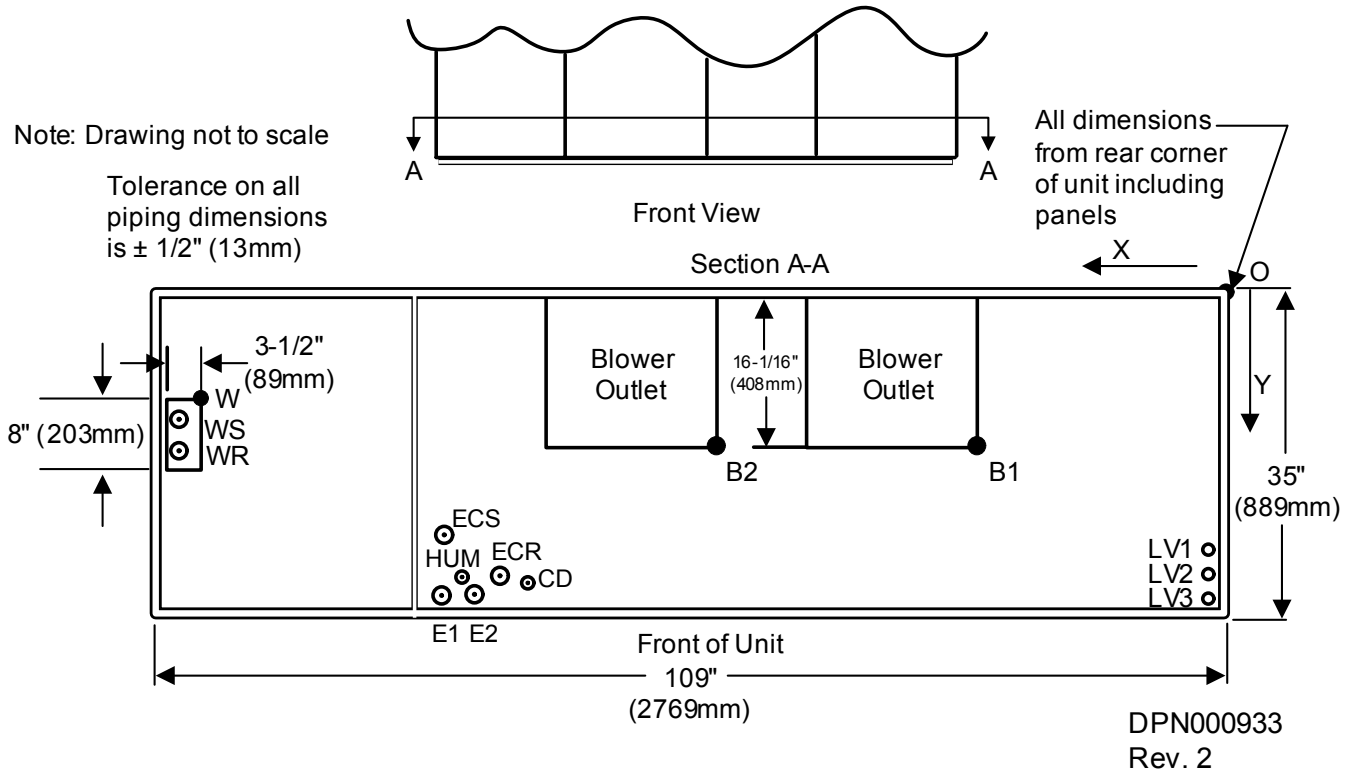
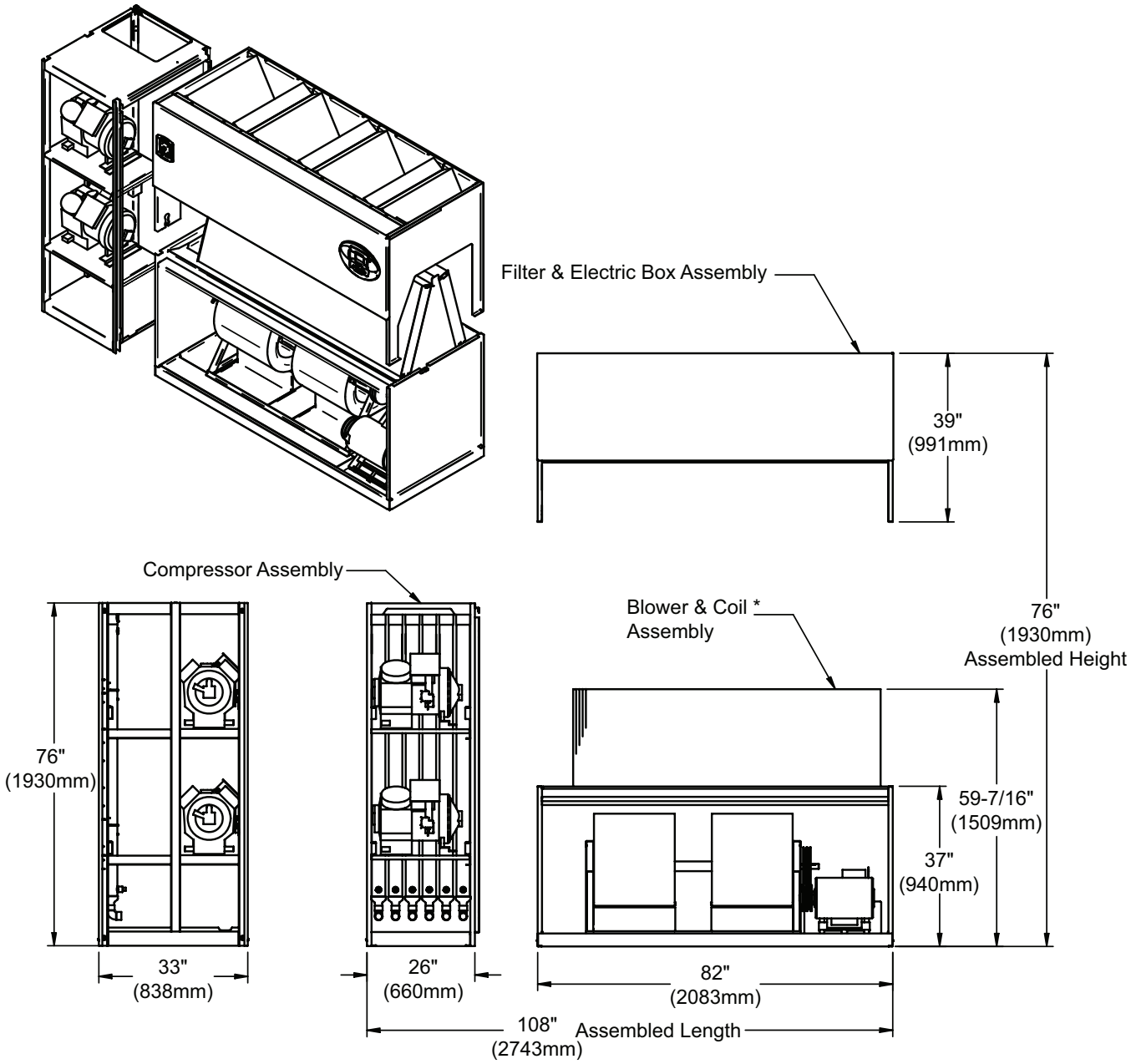


Table 30 Downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
W	Water/Glycol/GLYCOOL Access	103 (2616)	9 (229)	3-1/2 x 8 (89 x 203)
WS	Water/Glycol/GLYCOOL Supply	104-3/4 (2661)	11 (279)	2-1/8" Cu Sweat
WR	Water/Glycol/GLYCOOL Return	104-3/4 (2661)	15 (381)	2-1/8" Cu Sweat
CD	Condensate Drain *	69-1/4 (1759)	30 (762)	3/4" FPT
	W/ Optional Pump	69-1/4 (1759)	30 (762)	1/2" Cu Sweat
HUM	Humidifier Supply Line	76-1/2 (1943)	29 (736)	1/4" Cu Sweat
ECS	Econ-O-Coil Supply	78-5/8 (1997)	22-1/4 (565)	2-1/8" Cu Sweat
ECR	Econ-O-Coil Return	72 (1829)	29 (737)	2-1/8" Cu Sweat
HS	Hot Water Reheat Supply	Consult local representative		
HR	Hot Water Reheat Return	Consult local representative		
E1	Electrical Conn. (High Volt)	78-1/2 (1994)	31-1/8 (790)	2-1/2"
E2	Electrical Conn. (High Volt)	75-3/8 (1915)	31-1/8 (790)	2-1/2"
LV1	Electrical Conn. (Low Volt)	1-7/8 (48)	28-1/2 (724)	7/8"
LV2	Electrical Conn. (Low Volt)	1-7/8 (48)	30-1/4 (768)	7/8"
LV3	Electrical Conn. (Low Volt)	1-7/8 (48)	32 (813)	7/8"
B1	Blower Outlet (15 x 15)	23-1/8 (587)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)
	Blower Outlet (15 x 11)	27-3/4 (705)	18-1/16 (459)	14-3/4 x 16-1/16 (375 x 408)
B2	Blower Outlet (15 x 15)	50-3/8 (1280)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)
	Blower Outlet (15 x 11)	54-3/8 (1381)	18-1/16 (459)	14-3/4 x 16-1/16 (375 x 408)

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

Figure 20 Disassembly dimensions - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

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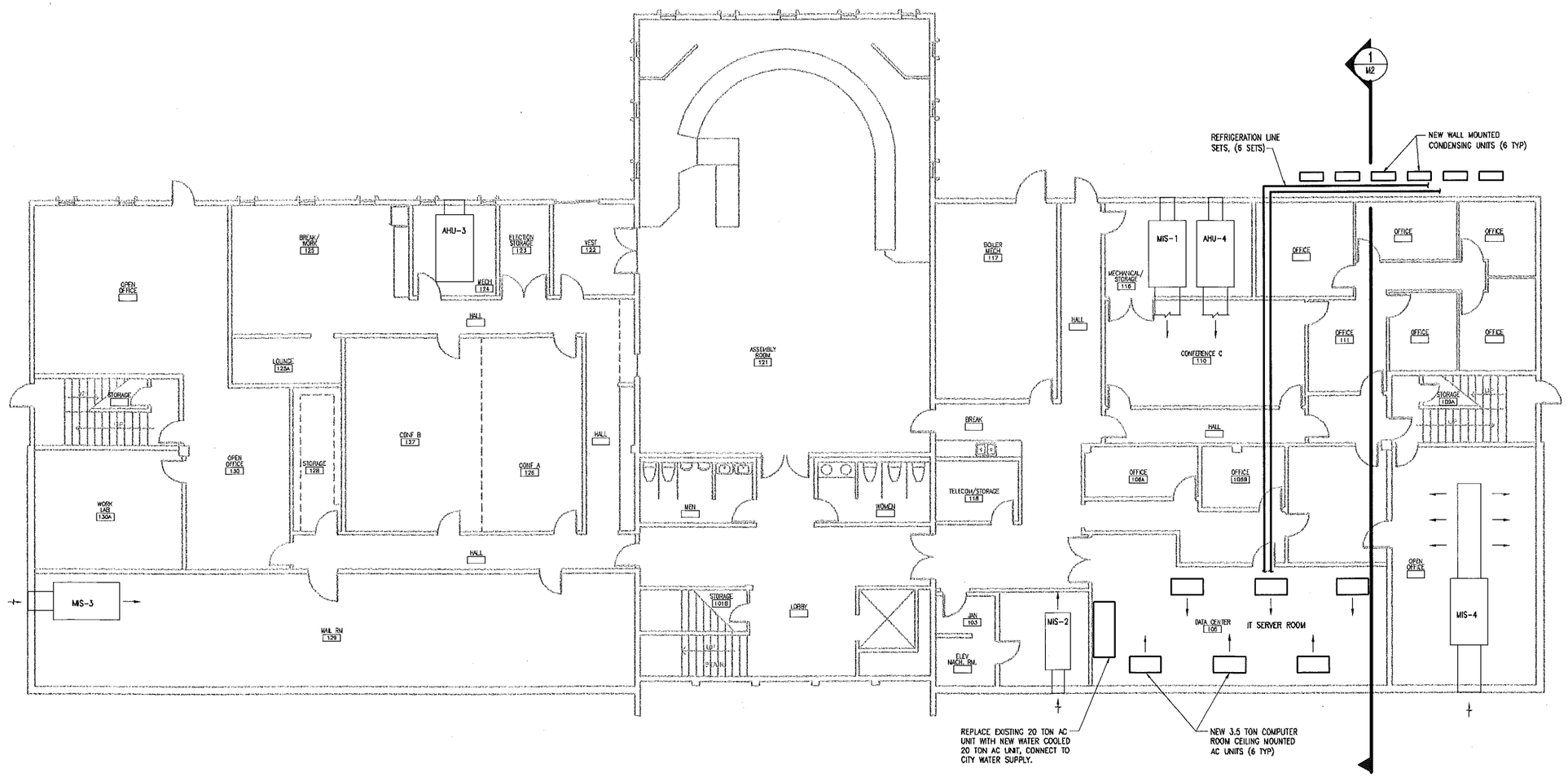
Table 31 Component weights - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

Dry Weight, Approximate, Including Panels, lb (kg)				
	Semi-Hermetic Compressor		Scroll or Digital Scroll Compressor	
Component	Water/Glycol	GLYCOOL/Dual-Cool	Water/Glyco	GLYCOOL/Dual-Cool
Compressor Assembly	1270 (578)	1270 (578)	840 (382)	840 (382)
Filter & Electric Box Assembly	250 (114)	250 (114)	250 (114)	250 (114)
Blower & Coil Assembly	1230 (560)	1410 (641)	1230 (560)	1410 (641)

APPENDIX 4

SCHEMATIC DRAWINGS

AMC ENGINEERS



1/M1 GROUND FLOOR PLAN - MECHANICAL

1/8" = 1'-0"

GRAPHIC SCALE 0 4' 8' 16' 24'

File: X:\08813 BABSTDY\Dwgs\M4dwg\08813 IT SERVER ROOM\08813 - M1 - FPOD-MECH ITF.dwg

Adams, Morgenthaler and Co, Inc.
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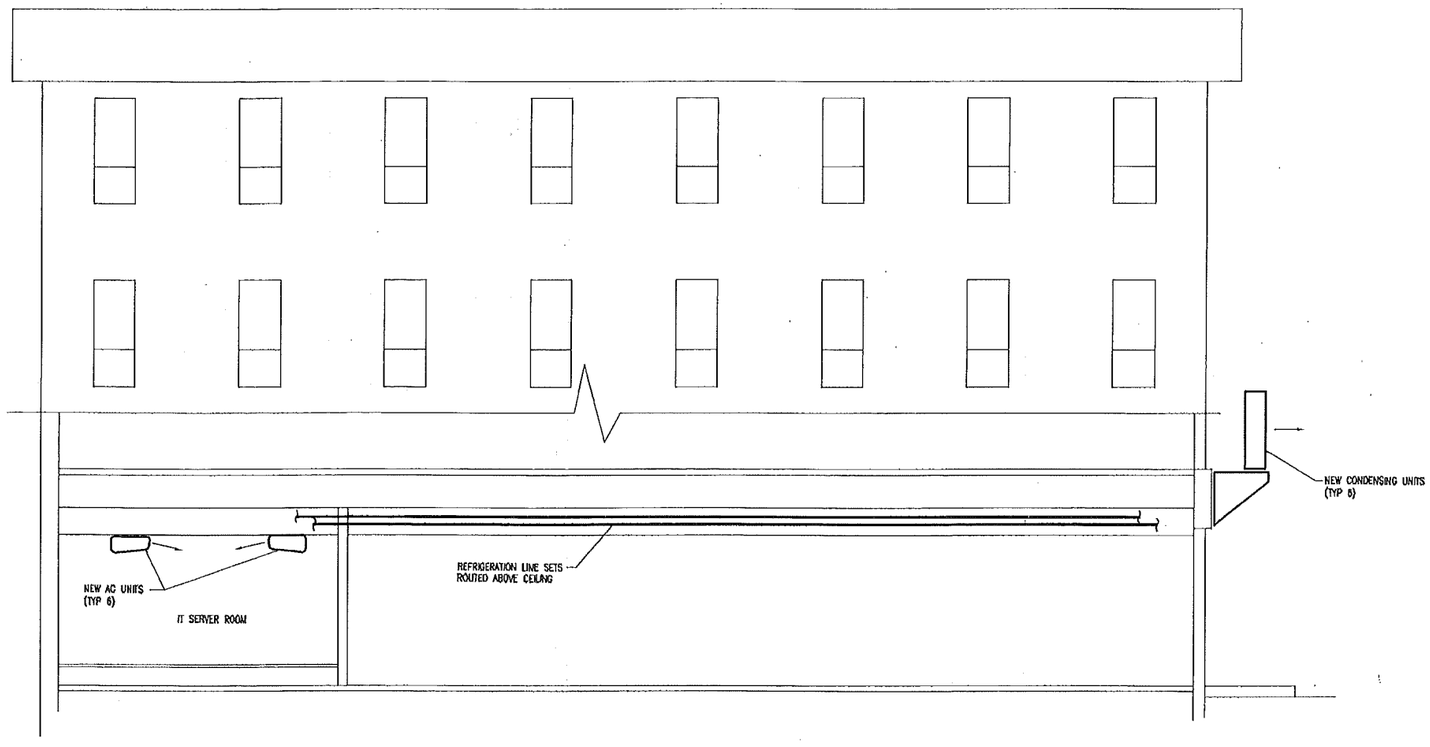
08813

KENAI PENINSULA BOROUGH
IT SERVER ROOM
AC UNIT REPLACEMENT STUDY (OPTION 2)

GROUND FLOOR PLAN

REV./DATE:	
DESIGN:	WBK
DRAWN:	BAS/DGB
CHECKED:	MDL
CADFILE:	
JOB No.:	08813
DATE:	4/29/09

SHEET M1
1 OF 2



1 / M2 SECTION – IT SERVER ROOM AC UNITS AND CONDENSERS
1/4"=1'-0"

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08813

KENAI PENINSULA BOROUGH
IT SERVER ROOM
AC UNIT REPLACEMENT STUDY (OPTION 2)
SECTION

REV./DATE:	
DESIGN:	WBK
DRAWN:	BAS/DGB
CHECKED:	MDL
CADFILE:	
JOB No.:	08813
DATE:	4/29/09

SHEET
M2
2 OF 2

File: X:\08813 BASSTDY\Dwgs\Mdwg\08813 IT SERVER ROOM\08813 M-MECH-SECTP.dwg