FILTERS AND FILTER HOUSINGS

MARK F	SYSTEM	LOCATION	TYPE	CFM	MIN. FACE AREA (FT²)	PRESS. DROP ("WG) INITIAL	PRESS. DROP ("WG) FINAL	PD FOR FAN TSP AND AIR BALANCE	MIN. EFF. (%)	REMARKS
F-1B	AHU-1B	PENTHOUSE	1	24,000	64	0.4	0.75	0.5	MERV 8	
F-2B	AHU-1B	PENTHOUSE	2	24,000	64	1	1.5	1.25	MERV 13 (85%)	
F-3B	AHU-1B	PENTHOUSE	1	19,800	53	0.4	0.75	0.5	MERV 8	1
F-4B	AHU-2B	PENTHOUSE	1	24,000	64	0.4	0.75	0.5	MERV 8	
F-5B	AHU-2B	PENTHOUSE	2	24,000	64	1	1.5	1.25	MERV 13 (85%)	
F-6B	AHU-2B	PENTHOUSE	1	19,800	53	0.4	0.75	0.5	MERV 8	1

FILTER TYPES
1 2" REPLACEABLE CELL MEDIA
2 6" CARTRIDGE TYPE

1. EXHAUST

AIR SYSTEMS VARIABLE FREQUENCY DRIVES

MARK VFD	SYSTEM	MAX. HORSEPOWER	INPUT ELECTRICAL CHARACTERISTICS VOLT	FREQUENCY	PHASE	BY-PASS STARTER	REMARKS
VFD-SF-1B	SF-1B	80	480	60	3	YES	2
VFD-SF-2B	SF-2B	80	480	60	3	YES	2
VFD-EF-1B	EF-1B	30	480	60	3	YES	2
VFD-EF-2B	EF-2B	30	480	60	3	YES	2
VFD-EF-3	EF-3	15	480	60	3	YES	3
VFD-EF-4	EF-4	15	480	60	3	YES	3

DUCT PRESSURE CLASS, MATERIAL & LEAKAGE

SYSTEM	SERVICE	PRESSURE CLASS (IN WG)	LEAKAGE TEST PORTION (% OF LENGTH)	ALLOWABLE (% OF AIRFLOW)	TEST PRESSURE (IN WG)
	AHU TO TERMINAL DEVICES	+6"	25	1%	+6"
	TERMINAL DEVICES TO AIR OUTLETS	+2"	25	1%	+2"
	EA TO TERMINAL DEVICES	-2"	25	1%	-2"
	EA TERMINAL DEVICES TO ERS	-6"	25	1%	-6"
	OTHER SA/RA DISCHARGE SYSTEMS	+2"	25	1%	+2"
	OTHER EA/RA SUCTION SYSTEMS	-2"	25	1%	-2"

INTAKE OR EXHAUST HOODS

MARK IH/RH	LOCATION	SERVICE	CAPACITY (CFM)	HEIGHT (IN)	THROAT SIZE (IN) (W x L)	MAXIMUM INLET VELOCITY (FPM)	DAMPER	BASED ON	REMARKS
IH-1	ROOF	TORNADO SHELTER INTAKE	2050	16	20x12	800	YES	GREENHECK SDLE	(1), (2), (3), (4)

(1) PROVIDE 24 INCH ROOF CURB
(2) DAMPERS TO BE PARALLEL BLADE
(3) PROVIDE SEVERE DUTY STEEL CURB.
(4) PROVIDE BIRD SCREEN

SOUND ATTENUATING DEVICES

MARK SAD	LOCATION	SERVICE	TOTAL CAPACITY (CFM)	MAXIMUM VELOCITY (FPM)	MAXIMUM PD ("WG)	OVERALL DIMENSION (IN) H	W	L	DYNAMIC INSERTION LOSS / MAXIMUM SELF GENERATED POWER LEVELS 63	125	250	500	1000	2000	4000	8000	REMARKS
SAD-1	AHU-1 SA DUCT	AHU-1 SA	24,000	1000	0.3	30	98	120	14 / 57	15 / 44	25 / 36	38 / 44	44 / 45	55 / 42	50 / 38	31 / 34	(3)
SAD-2	AHU-2 SA DUCT	AHU-2 SA	24,000	1000	0.3	30	98	120	14 / 57	15 / 44	25 / 36	38 / 44	44 / 45	55 / 42	50 / 38	31 / 34	(3)
SAD-1A	AHU-1 GEN. EXH	EF-1	19,800	1200	0.3	24	80	60	8 / 53	8 / 35	12 / 44	22 / 51	12 / 55	12 / 60	9 / 56	3 / 41	(2)
SAD-2A	AHU-2 GEN. EXH	EF-2	19,800	1200	0.3	24	80	108	12 / 49	8 / 30	14 / 41	20 / 49	23 / 53	13 / 57	8 / 50	5 / 34	(2)
SAD-3	FUME EXH	EF-3/4	4,595	1500	0.3	18	26	60	7 / 48	7 / 31	12 / 31	20 / 45	11 / 50	10 / 54	7 / 51	2 / 37	(1)
SAD-4	FUME EXH	EF-3/4	1,270	1000	0.3	12	16	60	6 / 40	6 / 21	11 / 31	18 / 39	15 / 44	11 / 47	8 / 41	5 / 25	(1)

(1) RECTANGULAR PACKLESS, STAINLESS STEEL. MOUNTED IN WELDED STAINLESS STEEL DUCT.

(2) RECTANGULAR PACKLESS, GALVANIZED STEEL CONSTRUCTION

(3) RECTANGULAR WITH TEDLAR LINER

SUPPLY AND EXHAUST FANS

MARK	LOCATION	SERVICE	TOTAL CFM	TSP ("WG)	ESP ("WG)	FAN QUANTITY	FAN TYPE	FAN DRIVE	WHEEL TYPE TYPE	MIN. DIA.	FAN SHAFT RPM	FAN CLASS	DAMPER	INTERLOCK	MOTOR HP EA	HP TOTAL	PH	VOLT	VFD	MAX. INLET/DISCHARGE SOUND POWER LEVELS(1) 63 HZ	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ	4000 HZ	8000 HZ	REMARKS
SF-1B	AHU-1B	#REF!	24,000	7.75	3.8	4	1	DIRECT	BI	18.25	2671	III	BY-PASS	EF-1B, 3, 4, 5	20	80	3	480	YES	96/89	91/86	89/90	97/84	92/84	91/82	91/80	87/76	
SF-2B	AHU-2B	AHU-2B	24,000	7.75	3.8	4	1	DIRECT	BI	18.25	2671	III	BY-PASS	EF-2B, 3, 4, 5	20	80	3	480	YES	96/89	91/86	89/90	97/84	92/84	91/82	91/80	87/76	
EF-1B	AHU-1B	GENERAL EXHAUST	19,800	5.5	3.8	4	1	DIRECT	BI	18.25	1982	II	BY-PASS	SF-1B	7.5	30	3	460	YES	95/86	89/83	85/86	94/81	9182	88/79	88/78	86/74	
EF-2B	AHU-2B	GENERAL EXHAUST	19,800	5.5	3.8	4	1	DIRECT	BI	18.25	1982	II	BY-PASS	SF-2B	7.5	30	3	460	YES	95/86	89/83	85/86	94/81	9182	88/79	88/78	86/74	
EF-3	PENTHOUSE	FUME HOOD EA	8,400	5	4.8	1	3	BELT	BI	22	2121	II	BY-PASS	AHU-1/2	15	15	3	460	YES									4
EF-4	PENTHOUSE	FUME HOOD EA	8,400	5	4.8	1	3	BELT	BI	22	2121	II	BY-PASS	AHU-1/2	15	15	3	460	YES									4
EF-5	HIGH ROOF	R.I. FUME HOOD EA	800	4	4	1	3	BELT	BI	12	3094	II	BY-PASS	AHU-1/2	3	3	3	460	NO									4
EF-6	ROOF	TORNADO SHELTER	2,050	0.5	0.5	1	6	BELT	-	12	1689	I	MOTORIZED	IH-1	0.5	0.5	3	460	NO									5

1. DISCHARGE SOUND POWER LEVELS FOR SUPPLY FANS AND INLET SOUND POWER LEVELS FOR RETURN AND EXHAUST FANS.
2. REFER TO DRAWINGS FOR MOTOR LOCATION
3. FAN TYPES
1 PLENUM FAN
2 DWDI CENTRIFUGAL
3 SWSI CENTRIFUGAL WITH HIGH PLUME DISCHARGE
4 HIGH PLUME
5 UPBLAST KITCHEN HOOD FAN WITH ROOF CURB
6 DOWNBLAST CURB MOUNTED ROOF FAN WITH ROOF CURB AND MOTORIZED DAMPER
7 INLINE CABINET
8 MIXED FLOW
4. FAN TO BE PROVIDED WITH BAKED PHENOLIC COATING
5. FAN SHALL BE MEET FEMA 361 REQUIREMENTS FOR TORNADOS.

AIR HANDLING UNITS

MARK AHU	LOCATION	SERVICE	AIR FLOW MAX CFM	MIN. OA (CFM)	FANS	ROTARY HEAT RECOVERY	COOLING COIL	HUMIDIFIER	HEATING COIL	PRE FILTER	FINAL FILTER	EXHAUST FILTER	REMARKS
					REFER TO FAN SCHEDULES FOR PERFORMANCE	REFER TO ROTARY HEAT RECOVERY SCHEDULE FOR PERFORMANCE	REFER TO COOLING COIL SCHEDULE FOR PERFORMANCE	REFER TO HUMIDIFIER SCHEDULE FOR PERFORMANCE	REFER TO HEATING COIL SCHEDULE FOR PERFORMANCE	REFER TO FILTER SCHEDULES FOR PERFORMANCE	REFER TO FILTER SCHEDULES FOR PERFORMANCE	REFER TO FILTER SCHEDULES FOR PERFORMANCE	
AHU-1B	PENTHOUSE	LAB/OFFICE	24,000	24,000	SF-1B, EF-1B	HRW-1B	CC-1B		HC-2A	F-1B	F-2B	F-3B	1
AHU-2B	PENTHOUSE	LAB/OFFICE	24,000	24,000	SF-2B, EF-2B	HRW-2B	CC-2B		HC-2B	F-4B	F-5B	F-6B	1

1. PROVIDE TRANSFORMER REQUIRED FOR 120V POWER FOR CONVEINENCE OUTLETS AND LIGHTS. SEE SPECIFICATION 23 7323 FOR ELECTRICAL REQUIREMENTS.

HUMIDIFIERS

MARK H	LOCATION	SYSTEM	TYPE	CFM	CAPACITY (LBS/HR)	REQUIRED SPACE CONDITIONS DB (oF)/RH(%)	MAXIMUM ABSORTION DISTANCE (INCHES)	MANIFOLD LENGTH (IN)	MANIFOLD HEIGHT (IN)	MANIFOLD QUANTITY	KW	AMPS	PH	VOLT	REMARKS
H-1A	PENTHOUSE	AHU-1 (1/3)	ELECTRIC	24,000	140	72/30	36	(1)	(1)	1	72	87	3	480	
H-1B	PENTHOUSE	AHU-1 (2/3)	ELECTRIC	24,000	280	72/30	36	(1)	(1)	1	96	116	3	480	
H-2A	PENTHOUSE	AHU-2 (1/3)	ELECTRIC	24,000	140	72/30	36	(1)	(1)	1	72	87	3	480	
H-2B	PENTHOUSE	AHU-2 (2/3)	ELECTRIC	24,000	280	72/30	36	(1)	(1)	1	96	116	3	480	

NOTES
(1) MANIFOLD WITHIN AIR HANDLING UNIT TO BE 304 STAINLESS STEEL

ROTARY AIR-TO-AIR EXCHANGERS

MARK HRW	SYSTEM	SUPPLY AIR CFM	PD ("WG)	EXHAUST AIR CFM	PD ("WG)	SUMMER CONDITIONS OA ENTERING T DB (°F)	OA ENTERING T WB (°F)	OA LEAVING T DB (°F)	OA LEAVING T WB (°F)	EA ENTERING T DB (°F)	EA ENTERING T WB (°F)	EA LEAVING T DB (°F)	EA LEAVING T WB (°F)	TOTAL EFFECTIVENESS %	WINTER CONDITIONS OA ENTERING T DB (°F)	OA ENTERING T WB (°F)	OA LEAVING T DB (°F)	OA LEAVING T WB (°F)	EA ENTERING T DB (°F)	EA ENTERING T WB (°F)	EA LEAVING T DB (°F)	EA LEAVING T WB (°F)	TOTAL EFFECTIVENESS %	MOTOR HP	VOLT	PH	LEAKAGE PURG CFM	SEAL CFM	REMARKS
HRW-1B	AHU-1B	24,000	1.15	19,800	0.94	95.0	78.0	83.0	69.9	75.0	62.3	89.8	74.4	75.0	-10	-11	37.8	37.2	70.0	58.2	14.9	14.9	76.0	2	460	3	0	600	
HRW-2B	AHU-2B	24,000	1.15	19,800	0.94	95.0	78.0	83.0	69.9	75.0	62.3	89.8	74.4	75.0	-10	-11	37.8	37.2	70.0	58.2	14.9	14.9	76.0	2	460	3	0	600	

COOLING COILS IN AHU

MARK CC	SYSTEM	AIR SIDE CFM	OA CFM	MAX. FACE VEL.	MAX. PD ("WG)	NOMINAL SIZE FACE AREA (F²)	DIM (IN) H	L	COOLING CAPACITY TOTAL MBH	SENS MBH	EAT (°F) DB	WB	LAT (°F) DB	WB	WATER SIDE GPM	EWT (°F)	LWT (°F)	MAX ROWS	MAX. FPI	FIN TYPE	MAX. PD (FT)	FLUID	REMARKS
CC-1B	AHU-1B	24,000	24,000	376	0.75	63.8	54	85	1,891	977	91	76.7	51.9	51.9	186	42	62	8	11	FLAT	15	WATER	1
CC-2B	AHU-2B	24,000	24,000	376	0.75	63.8	54	85	1,891	977	91	76.7	51.9	51.9	186	42	62	8	11	FLAT	15	WATER	1

1. PERFORMANCE SELECTED WITHOUT HRW IN OPERATION
2. MINIMUM TUBE VELOCTIY 4 FPS

HEATING COILS IN AIR HANDLING UNITS

MARK HC	SYSTEM	CFM	TOTAL CAP. NUMBER OF COILS	MBH	NOMINAL SIZE FACE AREA (SF)	DIM (IN) H	L	AIR SIDE MAX. FACE VEL.	MAX. PD ("WG)	EAT (°F)	LAT (°F)	WATER SIDE GPM	MAX. PD (FT)	EWT (°F)	LWT (°F)	FLUID	ROWS	FINS PER INCH	FIN TYPE	REMARKS
HC-1B	AHU-1B	24,000	2	1,685	49.6	42	85	484	0.55	-10	55	42	15	130	50	WATER	4	12	FLAT	1
HC-2B	AHU-2B	24,000	2	1,685	49.6	42	85	484	0.55	-10	55	42	15	130	50	WATER	4	12	FLAT	1

1. PERFORMANCE SELECTED WITHOUT HRW IN OPERATION
2. MINIMUM TUBE VELOCITY 4 FPS

SMITHGROUP
architecture engineering interiors planning
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Affiliated Engineers, Inc.
5802 Research Park Boulevard
Madison, Wisconsin 53719
Tel 608.238.2616 Fax 608.238.2614

Thornton Tomasetti
Thornton Tomasetti, Inc.
330 N. Wabash Avenue, Suite 1500
Chicago IL 60611-7622
T 312.596.2000 F 312.596.2001

TERRA ENGINEERING LTD.
225 West Ohio Street, 4th Floor
Chicago, Illinois 60654
T:(312)467-0123 F:(312) 467-0220

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Argonne NATIONAL LABORATORY

FMS
Facilities Management Services

PROJECT TITLE ADVANCED PROTEIN CRYSTALLIZATION FACILITY, ARGONNE NATIONAL LABORATORY
PROJECT NO 08541-00
DRAWING TITLE
AIRSIDE EQUIPMENT SCHEDULE

DESIGNED SPF | A/E CADD FILE MH7.0.0 | FACILITY NO(S)
DRAWN LW | A/E DWG. NO. MH7.0.0
CHECKED SPF | CAD NO:
PROJECT MANAGER ANL - JESSE ADAMS | DWG STATE
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