System Checksums

By Hallberg Engineering, Inc.

System — **Single Zone**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 7 / 13
Outside Air: ODB/WB/HR: 93 / 74 / 96

	Space Sens. + Lat. Btu/h	Plenum Sens. + Lat Btu/h	Net Total Btu/h	Percent Of Total (%)
Envelope Loads				
Skylite Solar	0	0	0	0
Skylite Cond	0	0	0	0
Roof Cond	0	0	0	0
Glass Solar	66,756	0	66,756	23
Glass/Door Cond	7,805	0	7,805	3
Wall Cond	4,896	187	5,083	2
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	79,457	187	79,644	28
Internal Loads				
Lights	43,567	0	43,567	15
People	53,208	0	53,208	18
Misc	17,122	0	17,122	6
Sub Total ==>	113,897	0	113,897	39
Ceiling Load	36	-36	0	0
Ventilation Load	0	0	81,959	28
Adj.Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		0	0	0
Sup. Fan Heat			12,899	4
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	193,390	151	288,398	100.00

CLG SPACE PEAK

Mo/Hr: Sum of
ODB: Peaks

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	86,408	46
Glass/Door Cond	4,581	2
Wall Cond	4,747	3
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	95,736	51
Internal Loads		
Lights	43,567	23
People	29,562	16
Misc	17,122	9
Sub Total ==>	90,251	49
Ceiling Load	-77	0
Ventilation Load	0	-99,312
Adj.Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Exhaust Heat		0
OA Preheat Diff.		0
RA Preheat Diff.		0
Additional Reheat		0
Underflr Sup Ht Pkup		0
Supply Air Leakage		0
Grand Total ==>	-36,405	-136,067

HEATING COIL PEAK

Mo/Hr: Heating Design
ODB: 21

	Space Peak Space Sens Btu/h	Coil Peak Tot Sens Btu/h	Percent Of Total (%)
Envelope Loads			
Skylite Solar	0	0	0.00
Skylite Cond	0	0	0.00
Roof Cond	0	0	0.00
Glass Solar	0	0	0.00
Glass/Door Cond	-25,040	-25,040	18.40
Wall Cond	-11,288	-11,716	8.61
Partition/Door	0	0	0.00
Floor	0	0	0.00
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-36,328	-36,756	27.01
Internal Loads			
Lights	0	0	0.00
People	0	0	0.00
Misc	0	0	0.00
Sub Total ==>	0	0	0.00
Ceiling Load	0	0	0.00
Ventilation Load	0	-99,312	72.99
Adj.Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-36,405	-136,067	100.00

TEMPERATURES

	Cooling	Heating
SADB	56.0	73.1
Ra Plenum	72.0	70.0
Return	72.0	70.0
Ret/OA	75.6	61.4
Fn Mtr/TD	0.1	0.0
Fn Bld/TD	0.5	0.0
Fn Frict	0.5	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	10,448	10,448
Terminal	10,448	10,448
Main Fan	10,448	10,448
Sec Fan	0	0
Nom Vent	1,803	1,803
AHU Vent	1,803	1,803
Infil	0	0
Min/Stop/Rh	0	0
Return	8,654	8,654
Exhaust	9	9
Rm Exh	1,794	1,794
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	17.3	17.3
cfm/ft²	1.50	1.50
cfm/ton	434.72	
ft²/ton	290.68	
Btu/hr·ft²	41.28	-19.48
No. People	89	

COOLING COIL SELECTION

	Total Capacity ton	MBh	Sens Cap. MBh	Coil Air/Flow cfm	Enter DB/WB/HR °F	°F	gr/lb	Leave DB/WB/HR °F	°F	gr/lb
Main Clg	24.0	288.4	222.0	10,448	75.4	62.6	64.5	54.9	53.2	57.7
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Total	24.0	288.4								

AREAS

	Gross Total ft²	Glass ft²	(%)
Floor	6,986		
Part	0		
Int Door	0		
Ext'r	0		
Roof	0	0	0
Wall	2,302	1,050	46
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Air/Flow cfm	Ent °F	Lvg °F
Main Htg	-136.1	10,448	61.4	73.1
Aux Htg	0.0	0	0.0	0.0
Preheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-136.1			

Project Name: Anthropologie
Dataset Name: LD-R14-1941-000.TRC

TRACE® 700 v6.2.8 calculated at 10:26 AM on 07/03/2014
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CONDENSING UNIT SCHED.

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ACCU #

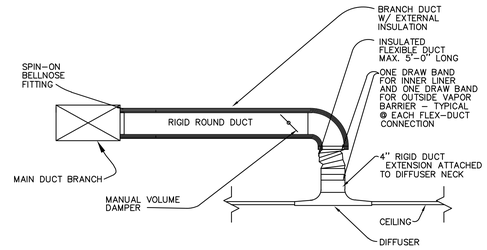
UNIT TAG	ACCU–1	ACCU–2	ACCU–3	ACCU–4
LOCATION	ROOF	ROOF	ROOF	ROOF
MANUFACTURER	TRANE	TRANE	TRANE	TRANE
MODEL NUMBER	4TTA3036	4TTA4048	TTA12OF3	TTA12OF3
SERVICE	FCU–1	FCU–2	FCU–3	FCU–4
REFRIGERANT TYPE	R–410A	R–410A	R–410A	R–410A
NOMINAL CAPACITY (TON)	3.0	4.0	10.0	10.0
EER (COMBINED)	11.5	11.5	11.2	11.2
CIRCUITS (DUAL, SINGLE)	SINGLE	SINGLE	SINGLE	SINGLE
COMPRESSOR				
TYPE	SCROLL	SCROLL	SCROLL	SCROLL
QUANTITY	1	1	2	2
UNLOADING %	0/100%	0/100%	0–50–100%	0–50–100%
CONDENSER				
NUMBER OF FANS	1	1	1	1
HP	1/8	1/5	1.0	1.0
MBH (OUTPUT)	36.0	45.1	107.8	107.8
AMBIENT AIR TEMP	100.0	100.0	100.0	100.0
REFR SUCTION TEMP	45°F	45°F	45°F	45°F
REFRIGERANT PIPE SIZES				
LIQUID	PER MANUF.	PER MANUF.	PER MANUF.	PER MANUF.
SUCTION	PER MANUF.	PER MANUF.	PER MANUF.	PER MANUF.
HOT GAS	PER MANUF.	PER MANUF.	PER MANUF.	PER MANUF.
ELECTRICAL				
MCA	14.0	18.0	44.6	44.6
V–PH–CY	208/3/60	208/3/60	208/3/60	208/3/60
STARTER	DIV. 15	DIV. 15	DIV. 15	DIV. 15
DISCONNECT	DIV. 16	DIV. 16	DIV. 16	DIV. 16
OPERATING WEIGHT (LBS)	150	205	440	440
REMARKS	PROVIDE UNIT WITH LOW AMB. CONTROL & CONDENSER COIL HAIL GUARDS	PROVIDE UNIT WITH LOW AMB. CONTROL & CONDENSER COIL HAIL GUARDS	PROVIDE UNIT WITH LOW AMB. CONTROL & CONDENSER COIL HAIL GUARDS	PROVIDE UNIT WITH LOW AMB. CONTROL & CONDENSER COIL HAIL GUARDS

FAN COIL UNIT SCHEDULE

(FURNISHED & INSTALLED BY LANDLORD. SHOWN FOR REFERENCE ONLY)

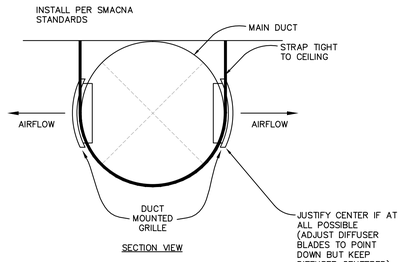
FCU #

UNIT TAG	FCU–1	FCU–2	FCU–3	FCU–4
AREA SERVED	FITTING	BOH	SALES	SALES
MANUFACTURER	TRANE	TRANE	TRANE	TRANE
MODEL NUMBER	BCHD036	BCHD054	TWE120D3	TWE120D3
TYPE	SPLIT	SPLIT	SPLIT	SPLIT
MIN OUTSIDE AIR	260	260	650	650
SUPPLY FAN				
CFM	960	1420	4200	4200
ESP	0.70"	0.70"	0.70"	0.70"
RPM	1202	870	991	991
HP	0.5	1.0	3.0	3.0
FILTERS				
TYPE	MERV 8	MERV 8	MERV 8	MERV 8
DX COOLING COIL				
CFM	960	1420	4200	4200
EAT DB/WB	78.0/65.3	76.1/63.1	74.8/62.0	74.8/62.0
LAT DB/WB	53.2/52.7	52.6/52.1	55.8/53.7	55.8/53.7
SENSIBLE/TOTAL MBH	26.1/35.9	36.6/45.1	95.5/107.8	95.5/107.8
REFRIGERANT TYPE	R–410A	R–410A	R–410A	R–410A
SPLIT	–	–	–	–
NUMBER OF CIRCUITS	1	1	1	1
HOT WATER HEATING COIL				
CFM	960	1420	4200	4200
ROW	1	1	2	2
EWT/LWT	180.0/150.0	180.0/150.0	180.0/150.0	180.0/150.0
EAT/LAT	56.9/103.8	61.0/99.7	62.0/104.5	62.0/104.5
MBH	48.8	59.6	193.0	193.0
GPM	3.25	4.0	13.0	13.0
APD	0.07	0.08	0.6	0.6
ELECTRICAL				
V–PH–CY	208/1/60	208/1/60	208/3/60	208/3/60
STARTER	DIV. 15	DIV. 15	DIV. 15	DIV. 15
DISCONNECT	DIV. 16	DIV. 16	DIV. 16	DIV. 16
OPERATING WEIGHT (LBS)	225	290	400	400
REMARKS	PROVIDE W/ ANGLE FILTER BOX	PROVIDE W/ ANGLE FILTER BOX	–	–



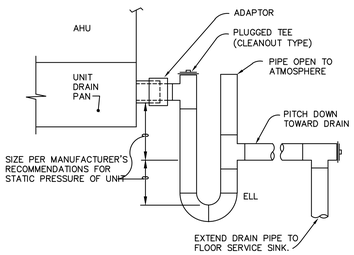
1 TYP. DIFFUSER/DUCT CONNECTIONS

NO SCALE — **DIFFUSER IN CEILING**



2 DUCT MOUNTED GRILLE

NO SCALE



3 FCU CONDENSATE CONNECTION

NO SCALE

DUCTWORK DESIGN/ INSTALLATION REQUIREMENTS

DUCT LOCATION AND CONDITION	TYPE	DUCTWORK ORIENTATION	DIFFUSER ORIENTATION	DUCTWORK HANGING	DUCTWORK CONNECTION	DUCTWORK MATERIAL	FINISH	NOTE
ALL EXPOSED DUCTWORK – SALES	SINGLE WALL SPIRAL ROUND	AS INDICATED ON PLAN	JUSTIFY CENTER	SMACNA STRAP AND SCREW	SLIP AND DRIVE	GALVANNEALED PAINT GRIP	PAINT PER SPECIFICATION. SEE ARCH DRAWINGS.	
ALL EXPOSED DUCTWORK – BOH	RECTANGULAR	AS INDICATED ON PLAN	JUSTIFY CENTER	SMACNA STRAP AND SCREW	SLIP AND DRIVE	GALVANIZED STEEL	FACTORY – NO FIELD FINISH	
ALL CONCEALED DUCTS	RECTANGULAR	AS INDICATED ON PLAN	AS INDICATED ON PLAN	SMACNA STRAP AND SCREW	SLIP AND DRIVE	GALVANIZED STEEL	FACTORY – NO FIELD FINISH	

GRILLE AND DIFFUSER SCHEDULE

(1 M200) (2 M200)

TYPE	A	B	C	D	E	F
ITEM	SUPPLY	SUPPLY	RETURN/TRANSFER	SUPPLY	SUPPLY	EXHAUST
DESCRIPTION	SQUARE PLAQUE	DUCT MOUNT	BLADE	DUCT MOUNT	LAY–IN	DUCT MOUNT
MANUFACTURER	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS
MODEL NUMBER	OMNI–24"X24"	S300FS	350RL	300RS	OMNI–12"X12"	350RL
REMARKS	STD. WHITE FINISH W/OPPOSED BLADE DAMPER & TRM PLASTER FRAME	STD. WHITE FINISH W/ AIR SCOOP DAMPER	STD. WHITE FINISH. POINT VANES UP OR TOWARD NEAREST WALL.	MILL FINISH	STD. WHITE FINISH W/OPPOSED BLADE DAMPER & TRM FRAME	MILL FINISH

EXHAUST FAN SCHEDULE

EF #

UNIT TAG	EF–1	EF–2	EF–3	EF–4
AREA SERVED	TOILET ROOM	TOILET ROOM	VISUAL MERCH.	OFFICE
FUNCTION	EXHAUST	EXHAUST	EXHAUST	EXHAUST
MANUFACTURER	PENNBARRY	PENNBARRY	PENNBARRY	PENNBARRY
MODEL NUMBER	7SH	7SH	212IS	28H
DRIVE (BELT, DIRECT)	DIRECT	DIRECT	DIRECT	DIRECT
FAN DATA				
CFM	95	95	900	350
ESP	0.375"	0.375"	0.375"	0.375"
RPM	1550	1550	970	1060
HP	79 WATTS	79 WATTS	370 WATTS	130 WATTS
ELECTRICAL				
V–PH–CY	115/1/60	115/1/60	115/1/60	115/1/60
STARTER	–	–	–	–
DISCONNECT	DIV. 16	DIV. 16	DIV. 16	DIV. 16
WEIGHT (LBS)	15	15	35	15
REMARKS	1,3	1,3	1,4	1,2

NOTES:
1. FAN SHALL BE FURNISHED AND INSTALLED WITH INTEGRAL (ON UNIT) SPEED CONTROLLERS FOR BALANCING PURPOSES. PENN LEK–TROL.
2. FAN SHALL BE CONTROLLED BY A PERMANENTLY ENGRAVED WALL SWITCH. SWITCH PROVIDED BY ELECTRICAL CONTRACTOR, ENGRAVED PLATE BY MECHANICAL CONTRACTOR. INSTALL HIGH OR ON FAN OUT OF EMPLOYEE REACH.
3. FAN SHALL BE INTERLOCKED WITH TOILET ROOM LIGHTS.
4. FAN SHALL BE CONTROLLED BY A WALL MOUNTED SOLID STATE SPEED CONTROL SWITCH FURNISHED BY THE MECHANICAL CONTRACTOR AND WIRED BY THE ELECTRICAL CONTRACTOR.

VENTILATION CALCULATIONS

OCCUPANCY	AREA (Az) (SQ. FT)	POPULATION (Pz)	OA RATE/PERSON (Rp)	OA RATE/SQ. FT (Ra)	ZONE DISTRIBUTION EFFECTIVENESS (Ez)
RETAIL SALES	4420	67	7.5	0.12	0.8

Vot = [(Az x Ra) + (Pz x Rp)]/.8 = 1291 CFM
TOTAL OA PROVIDED (SUM OF FCU–3,4) = 1300 CFM

OCCUPANCY	AREA (Az) (SQ. FT)	POPULATION (Pz)	OA RATE/PERSON (Rp)	OA RATE/SQ. FT (Ra)	ZONE DISTRIBUTION EFFECTIVENESS (Ez)
FITTING	1066	10	7.5	0.12	0.8

Vot = [(Az x Ra) + (Pz x Rp)]/.8 = 254 CFM
TOTAL OA PROVIDED (FCU–1) = 260 CFM

OCCUPANCY	AREA (Az) (SQ. FT)	POPULATION (Pz)	OA RATE/PERSON (Rp)	OA RATE/SQ. FT (Ra)	ZONE DISTRIBUTION EFFECTIVENESS (Ez)
STOCK	785	4	0	0.12	0.8
VISUAL ROOM	180	2	10	0.18	0.8
LOUNGE	390	4	5	0.06	0.8
OFFICE	145	2	5	0.06	0.8

Voz = Σ(Az x Ra) + (Pz x Rp)]/.8 = 260 CFM
Ev = 0.9
Vot = 209/0.9 = 232 CFM
TOTAL OA PROVIDED (FCU–2) = 260 CFM

MECHANICAL SYMBOLS

- EXISTING METAL DUCTWORK
- NEW SHEET METAL DUCTWORK
- DUCTWORK TRANSITION
- DUCT BRANCH TAKE–OFF
- ROUND SPIN–IN WITH DAMPER
- DUCT ELBOW WITH FIXED TURNING VANES (TO BE USED ONLY WHERE ROUND TURNS AREN'T FEASIBLE)
- REMOTELY ACCESSIBLE VOLUME DAMPER
- THERMOSTAT – MOUNT AT 4'–0"
- REMOTE TEMPERATURE SENSOR – MOUNT AT 4'–0"
- CEILING MOUNTED EXHAUST FAN
- FAN COIL UNIT (FCU)
- AIR COOLED CONDENSING UNIT (ACCU)
- RETURN GRILLE
- SUPPLY DIFFUSER
- SUPPLY/ OUTSIDE AIR DROP
- RETURN/ EXHAUST AIR RISER
- CONNECT TO EXISTING
- KEYED NOTE DESIGNATION
- FIRE DAMPER
- CO2 SENSOR
- DUCT SMOKE DETECTOR

AFF	ABOVE FINISHED FLOOR
CFM	CUBIC FEET PER MINUTE
EF	EXHAUST FAN
EA	EXHAUST AIR
CD	CEILING DIFFUSER
SA	SUPPLY AIR
RA	RETURN AIR
RG	RETURN GRILLE
OA	OUTSIDE AIR
TYP	TYPICAL
MC	MECHANICAL CONTRACTOR
EC	ELECTRICAL CONTRACTOR
LL	LANDLORD
GC	GENERAL CONTRACTOR

'x'|xx'ø / xxx — DIFFUSER TYPE | NECK SIZE / AIRFLOW

1 — REVISION DESIGNATION

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STATE OF MAINE — Richard — D11638 — LICENSED PROFESSIONAL ENGINEER

DRAWN BY: MDB CHECKED BY: CDS/RLL

NSA PROJECT NUMBER: 2013-99

PROJECT PHASE: CD

HEI PROJECT NUMBER: R14-1941.000

ISSUE / DATE:

100% CHECKSET	07-11-2014
BID/PERMIT	08-01-2014

REVISION :

SHEET TITLE :
MECHANICAL DETAILS, SYMBOLS & SCHEDULES
SHEET NO :
M200