

Report By:

**National TAB - Kansas City
1126 Swift St
N Kansas City, MO 64116**

NATIONAL



Report: Test and Balance

Date: 10/22/2021

**PROJECT
JACK STACK - LENEXA, KS**

8721 RYCKERT
LENEXA, KS

Client

**KELLY CONSTRUCTION GROUP
4021 E. 143RD STREET
GRANDVIEW, MO 64030**

Powered by



FACILIBUILD

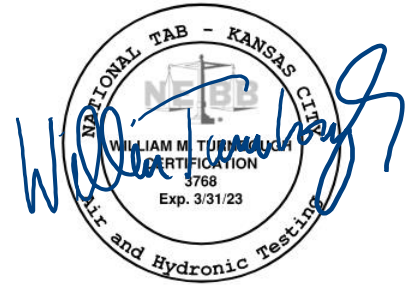
www.facilibuild.com

National TAB

Project: JACK STACK - LENEXA, KS

Table Of Contents

Section	Page #
Certification Page	3
Summary Data	4
AHU/RTU	5
FAN - Exhaust	17
FAN - Supply	28
Kitchen Hood Type I	33
Kitchen Hood Type II	42
GRD Layout	43
Abbreviations	44
Calibration List	45



Certification Page

Assigned Organization: National TAB

Status: Not Submitted

Asset:

	The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems. Any variances from design quantities, which exceed NEBB tolerances, are noted in the Test-Adjust-Balance Report Project Summary.
	The air distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.
NEBB TAB FIRM:	National TAB - Kansas City
REGISTRATION NUMBER:	3768
CERTIFIED BY:	William Turnbough
DATE:	10/22/2021

Notes/Comments:

Project Summary

SUMMARY

Facility Identification and TAB Requirements

The mechanical equipment to be tested, adjusted, and balanced includes: All RTU's, All EF's, All MUA's, All Hoods, and All Associated Air Devices.

RTU's

Each of the RTU's were measured at their terminal devices utilizing a flow hood. The sum of these readings is equal to the total flow for that particular unit. The total flow of each RTU was then adjusted to within tolerance of the specified design. Each terminal diffuser was balanced to within tolerance of the engineer's design volume utilizing the provided hand damper located at the takeoff of the main & branch trunk line(s). Any equipment that fell outside of this tolerance is noted throughout the report.

Kitchen Exhaust Hood & Associated Fans

Each kitchen exhaust fan was measured at the hood filter bay utilizing a velocity matrix and a manufacturer's correction factor. Each filter velocity is multiplied by the manufacturer's corrected area. The sum of these readings equals the total flow of the exhaust fans. The total flow of the exhaust was then adjusted within tolerance of the engineers design flow. Total flow for the MAU (Make-up Air Unit) unit was measured by readings taken at the discharge of the hood's perforated supply plenum. Readings taken with a velocity matrix were averaged and multiplied by a manufacturer's corrected area. Adjustments to the fan speed were made in order to bring the unit to within tolerance of design criteria. Any EF's or MUA's that fell outside of this tolerance is noted throughout the report.

Exhaust Fans

The general exhaust fans were measured by reading each air device with a flow hood. The total airflow for each fan is equivalent to the sum of these readings. Fan speed was then adjusted so that the airflow was within design tolerance. Each terminal device was balanced to within tolerance of the design volume using the installed volume dampers. Any equipment that fell outside of this tolerance is noted throughout the report.

REMARKS

1. Airflow on KEF6 (Hood 6) is 1903 CFM out of design of 3150 CFM and is operating at the service factor amperage. Discussed with the engineer and Captive Aire and it was determined that the back to back 90's out of the top of the hood is creating excessive turbulence and reducing the overall airflow. Hood capture was tested and observed as 100% so no further action required.
2. MUA4 (Hood 6/7) was set low to keep the MUA proportional to the low exhaust flow on Hood 6. MUA 1, 2, and 5 were increased above design (approved by Captive Aire and Engineer of Record) to ensure positive building pressure.
3. RTU-2, RTU-3, RTU-4, and RTU-5 are all balanced for total flow but the individual diffusers could not be balanced due to accessibility to dampers, missing dampers, and various other issues. For description of those issues see the individual asset pages.
4. RTU-6 in the kitchen total airflow is 3980 CFM out of design of 5000 CFM (80% of design). Duct sizes were checked on this unit and are sized appropriately. There are restrictive flex duct runs due to ceiling space which appears to be the cause of low flow.
5. F-7 (Restrooms) airflow is 1062 CFM out of design of 600 CFM with the speed controller minimized.
6. RTU-6 economizer is periodically getting stuck when trying to open and close which is causing alarms on the economizer controller. Recommend repairing.
7. RTU-4 blower periodically won't run. The VFD is making loud noises when this happens. Recommend repair.

Asset: RTU1

AREA: PRIVATE DINING

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Model Num	BELT	48TCEA04A2A5 A0A0A0
Serial Num	-	4915C78071
Configuration	-	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	28.25X14.25
Num PreFilter 1	-	2
PreFilter Size 1	-	16X25X2

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON ELECTRIC
Frame	-	56Y
Horsepower	-	1.5
Motor Rpm	-	1430
Phase	-	3
Rated Voltage	-	230/400
Rated Amperage	-	6.3/3.0
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	3.125"
Motor Bore Size	-	1.125"
Motor Sheave SetPt	-	4 TURNS OUT
Fan Sheave Size	-	AFD44
Fan Sheave Bore	-	3/4"
Belt CL Distance	-	14.625"
Num of Belts	-	1
Belt Size	-	AX38

Test Data		
	Design	Actual
SF CFM	1200	1298
SF RPM	-	953
RA CFM	-	1008
OA CFM	300	290
RL Voltage	-	212/213/212
RL Amperage	-	1.7/1.4/1.6
OA Damper Position	-	0.5
Brake Horse Power	-	0.36

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.49"
Fan Suction SP	-	-0.40"
Fan Discharge SP	-	0.21"
Total ESP	-	0.70"
Fan Total SP	-	0.61"

Completed By: Greg O'Day on 08/10/2021

Notes:

Diffuser Supply (GRD)

RTU1 / PRIVATE DINING

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	PRIVATE DINING	EX	12X8	400	0.87	487	431	431	107.8
SGRD2	PRIVATE DINING	EX	12X8	400	0.87	497	429	429	107.3
SGRD3	PRIVATE DINING	EX	12X8	400	0.87	479	438	438	109.5

Completed By: Greg O'Day on 08/10/2021

Asset	Area Served	Notes

Asset: RTU2

AREA: BAR

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Model Num	BELT	48TCEE08A2A5 A0A0A0
Serial Num	-	2316P97068
Configuration	-	HORIZONTAL
Num OA Filters 1	-	1
OA Filter Size 1	-	29.25X20.5
Num PreFilter 1	-	4
PreFilter Size 1	-	16X20X2

Test Data		
	Design	Actual
SF CFM	3060	3062
SF RPM	-	884
RA CFM	-	2084
OA CFM	900	978
RL Voltage	-	208/208/209
RL Amperage	-	5.4/5.7/6.0
OA Damper Position	-	1.5"
Brake Horse Power	-	UTO

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON ELECTRIC
Frame	-	56HZ
Horsepower	-	NOT LISTED
Motor Rpm	-	1725
Phase	-	3
Rated Voltage	-	208-230/460
Rated Amperage	-	8.4-8.3/4.2
Service Factor	-	1.15

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.49"
Fan Suction SP	-	-1.03"
Fan Discharge SP	-	0.60"
Total ESP	-	1.09"
Fan Total SP	-	1.63"

Drive Data		
	Design	Actual
Motor Sheave Size	-	5"
Motor Bore Size	-	7/8"
Motor Sheave SetPt	-	4.82"
Fan Sheave Size	-	AFD84
Fan Sheave Bore	-	1"
Belt CL Distance	-	17.25"
Num of Belts	-	1
Belt Size	-	AX52

Completed By: Greg O'Day on 08/10/2021

Notes: (1) Unit was balanced to schedule design cfm. Due no acess to the dampers above wooden ceiling on bar, the unit was balanced to total flow

Diffuser Supply (GRD)

RTU2 / BAR

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	BAR	EXSW	7.25X20	265	0.762	321	280	280	105.7
SGRD2	BAR	EXSW	7.25X20	265	0.762	265	250	250	94.3
SGRD3	BAR	EXSW	7.25X20	265	0.762	308	286	276	104.2
SGRD4	BAR	EXSW	7.25X20	265	0.762	316	375	375	141.5
SGRD5	BAR	EXSW	7.5X5.5	175	0.286	68	73	73	41.7
SGRD6	BAR	EXSW	7.5X5.5	175	0.286	65	84	84	48.0
SGRD7	BAR	EXSD	NA	350	1	298	339	339	96.9
SGRD8	BAR	EXSD	NA	350	1	548	339	339	96.9
SGRD9	BAR	EXSD	NA	350	1	310	230	230	65.7
SGRD10	BAR	EXSD	NA	350	1	301	279	279	79.7
SGRD11	BAR	EXSD	NA	350	1	360	330	330	94.3
SGRD12	BAR	EXSD	NA	350	1	228	207	207	59.1

Completed By: Greg O'Day on 08/10/2021

Asset	Area Served	Notes
SGRD1	BAR	Due to wooden ceilings, unable to reach dampers.
SGRD2	BAR	Due to wooden ceilings, unable to reach dampers.
SGRD3	BAR	Due to wooden ceilings, unable to reach dampers.
SGRD4	BAR	Due to wooden ceilings, unable to reach dampers.
SGRD5	BAR	Drawings show one circle diffuser. However, two side wall grills are installed instead. Due to their size, unable to reach the 350cfm combined.
SGRD6	BAR	Drawings show one circle diffuser. However, two side wall grills are installed instead. Due to their size, unable to reach the 350cfm combined.

Asset: RTU3

AREA: DINING

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Model Num	BELT	48TCEE12A2A5 A0A0A0
Serial Num	-	2316P97095
Configuration	-	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	21X36
Num PreFilter 1	-	4
PreFilter Size 1	-	20X20X2

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON
Frame	-	56HZ
Horsepower	-	NL
Motor Rpm	-	1725
Phase	-	3
Rated Voltage	-	10.6/5.3
Rated Amperage	-	230/460
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	5"
Motor Bore Size	-	7/8"
Motor Sheave SetPt	-	4.20"
Fan Sheave Size	-	AFD74
Fan Sheave Bore	-	1"
Belt CL Distance	-	16.5"
Num of Belts	-	1"
Belt Size	-	AX49

Completed By: Greg O'Day on 08/10/2021

Notes: (1) Motor sticker was found in the diffuser. Might not be correct motor label
 (2) Due to linear diffusers not having dampers and some dampers not accessible the unit was balanced for total flow.

Test Data		
	Design	Actual
SF CFM	4200	4181
SF RPM	-	1009
RA CFM	-	3015
OA CFM	1250	1166
RL Voltage	-	211/210/211
RL Amperage	-	8.3/7.8/7.9
OA Damper Position	-	2"
Brake Horse Power	-	UTO

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.59"
Fan Suction SP	-	-0.97"
Fan Discharge SP	-	0.63"
Total ESP	-	1.22"
Fan Total SP	-	1.60"

Diffuser Supply (GRD)

RTU3 / DINING

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	DINING	EXSD	10"	200	1	199	143	152	76.0
SGRD2	DINING	EXSD	10"	200	1	149	128	134	67.0
SGRD3	DINING	EXSD	10"	300	1	0	147	159	53.0
SGRD4	DINING	EXLD	NA	340	1	354	331	342	100.6
SGRD5	DINING	EXLD	NA	340	1	354	331	372	109.4
SGRD6	DINING	EXLD	NA	340	1	354	331	372	109.4
SGRD7	DINING	EXLD	NA	340	1	354	331	372	109.4
SGRD8	DINING	EXLD	NA	340	1	354	331	372	109.4
SGRD9	DINING	EXSD	10"	250	1	164	158	178	71.2
SGRD10	DINING	EXSD	10"	250	1	274	268	241	96.4
SGRD11	DINING	EXSD	10"	250	1	242	251	247	98.8
SGRD12	DINING	EXSD	10"	250	1	263	248	252	100.8
SGRD13	DINING	EXSD	10"	200	1	295	288	291	145.5
SGRD14	DINING	EXSD	10"	200	1	345	352	211	105.5
SGRD15	DINING	EXSD	10"	200	1	343	329	212	106.0
SGRD16	DINING	EXSD	10"	200	1	276	256	274	137.0

Completed By: Greg O'Day on 08/10/2021

Asset	Area Served	Notes
SGRD5	DINING	Exisitng linears have no dampers.
SGRD6	DINING	Exisitng linears have no dampers.
SGRD7	DINING	Exisitng linears have no dampers.
SGRD8	DINING	Exisitng linears have no dampers.
SGRD13	DINING	No access to dampers due to wooden cloud ceiling.
SGRD16	DINING	No access to dampers due to wooden cloud ceiling.

Asset: RTU4

AREA: KITCHEN

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Model Num	BELT	48TCFE16A2M5 A6F4J0
Serial Num	-	1721P14008
Configuration	-	VERTICAL
Num OA Filters 1	-	2
OA Filter Size 1	-	23.5X26.5
Num PreFilter 1	-	6
PreFilter Size 1	-	18X24X2

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON ELECTRIC
Frame	-	56HZ
Horsepower	-	NL
Motor Rpm	-	1750
Phase	-	3
Rated Voltage	-	230/460
Rated Amperage	-	9.2/4.6
Service Factor	-	NL

Drive Data		
	Design	Actual
Motor Sheave Size	-	3.75"
Motor Bore Size	-	7/8"
Motor Sheave SetPt	-	4.5 TURNS OPEN
Fan Sheave Size	-	BK80
Fan Sheave Bore	-	1.1875"
Belt CL Distance	-	20.75"
Num of Belts	-	1
Belt Size	-	BX56

Completed By: Andrew Becerra on 10/15/2021

- Notes:
- (1) The tight ceiling space is resulting in kinks in the flex duct reducing some flow to some diffusers. This has been improve as much as possible. Dampening futher reduces the CFM below tolerance
 - (2) Supply drop smallest point is the canvas connector which is 28"x28".
 - (3) Unable to reach the return duct, but the return grill above the ceiling has an opening of 14"x31"
 - (4) Blower motor periodically won't run. You can hear the VFD making loud noises.

Test Data		
	Design	Actual
SF CFM	5000	5021
SF RPM	-	709
RA CFM	-	3574
OA CFM	1500	1447
RL Voltage	-	211/212/212
RL Amperage	-	8.8/8.5/7.8
OA Damper Position	-	6.75 DCV
Brake Horse Power	-	UTO

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.68"
Fan Suction SP	-	-0.87"
Fan Discharge SP	-	0.57"
Total ESP	-	1.25"
Fan Total SP	-	1.44"

Diffuser Supply (GRD)

RTU4 / KITCHEN

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	KITCHEN	SB1	10"	438	1	507	507	654	149.3
SGRD2	KITCHEN	SB1	10"	438	1	506	506	521	118.9
SGRD3	KITCHEN	SB1	10"	438	1	348	348	390	89.0
SGRD4	KITCHEN	SB1	10"	469	1	199	199	561	119.6
SGRD5	KITCHEN	SB1	10"	469	1	390	390	363	77.4
SGRD6	KITCHEN	SB1	10"	469	1	512	512	460	98.1
SGRD7	KITCHEN	SB1	10"	468	1	287	287	525	112.2
SGRD8	KITCHEN	SB1	10"	468	1	281	281	307	65.6
SGRD9	KITCHEN	SB1	10"	468	1	471	471	376	80.3
SGRD10	KITCHEN	SB1	10"	437	1	494	494	447	102.3
SGRD11	KITCHEN	SB1	10"	438	1	443	443	417	95.2

Completed By: Greg O'Day on 08/10/2021

Asset	Area Served	Notes

Asset: RTU5

AREA: DINING

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Model Num	BELT	48TCEA07A2A5 A0A0A0
Serial Num	-	2116C77943
Configuration	-	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	28.25X14
Num PreFilter 1	-	4
PreFilter Size 1	-	16X16X2

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON ELECTRIC
Frame	-	56HZ
Horsepower	-	NL
Motor Rpm	-	1725
Phase	-	3
Rated Voltage	-	208-230/460
Rated Amperage	-	9.4-9.2/4.2
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	4.75"
Motor Bore Size	-	7/8"
Motor Sheave SetPt	-	0 TURNS OPEN
Fan Sheave Size	-	AK54
Fan Sheave Bore	-	5/8"
Belt CL Distance	-	14"
Num of Belts	-	1
Belt Size	-	AX41

Completed By: Stephon Fisher on 08/10/2021

Notes: (1) Due to tables, wooden ceiling, and hard lid ceiling dampers not accessible. Unit balanced to total flow.

Test Data		
	Design	Actual
SF CFM	2175	2352
SF RPM	-	1547
RA CFM	-	1915
OA CFM	480	437
RL Voltage	-	210/210/210
RL Amperage	-	6.6/7.2/7.3
OA Damper Position	-	1.25"
Brake Horse Power	-	UTO

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.71"
Fan Suction SP	-	-1.10"
Fan Discharge SP	-	0.17"
Total ESP	-	0.88"
Fan Total SP	-	1.27"

Diffuser Supply (GRD)

RTU5 / DINING

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	DINING	SA1	10"	250	1	115	117	134	53.6
SGRD2	DINING	SA1	10"	250	1	113	139	154	61.6
SGRD3	DINING	EXSD	10"	225	1	244	243	328	145.8
SGRD4	DINING	EXSD	10"	255	1	269	269	355	139.2
SGRD5	DINING	EXSD	10"	225	1	272	238	256	113.8
SGRD6	DINING	EXSD	10"	225	1	240	232	273	121.3
SGRD7	DINING	EXSD	10"	225	1	146	221	280	124.4
SGRD8	DINING	EXSD	10"	275	1	249	170	350	127.3
SGRD9	DINING	EXSD	10"	275	1	145	175	222	80.7

Completed By: Stephon Fisher on 08/10/2021

Asset	Area Served	Notes

Asset: RTU6

AREA: KITCHEN

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Model Num	BELT	48TCFE16A2M5 A6F4J0
Serial Num	-	1721P14009
Configuration	-	VERTICAL
Num OA Filters 1	-	2
OA Filter Size 1	-	24X27
Num PreFilter 1	-	6
PreFilter Size 1	-	18X24X2

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON ELECTRIC
Frame	-	56HZ
Horsepower	-	NL
Motor Rpm	-	1750
Phase	-	3
Rated Voltage	-	230/460
Rated Amperage	-	9.2/4.6
Service Factor	-	NL

Drive Data		
	Design	Actual
Motor Sheave Size	-	4
Motor Bore Size	-	7/8
Motor Sheave SetPt	-	4.5
Fan Sheave Size	-	BK80
Fan Sheave Bore	-	1.1875
Belt CL Distance	-	20.75
Num of Belts	-	1
Belt Size	-	BX56

Completed By: Stephon Fisher on 08/10/2021

- Notes:
- (1) Unable to reach the return duct, but the return grill above the ceiling has an opening of 12"x26"
 - (2) Supply drop smallest point is the canvas connector which is 24"x24"
 - (3) Economizer periodically will get suck when trying to open and close. Resulting in alarms on the economizer controller.

Test Data		
	Design	Actual
SF CFM	5000	3980
SF RPM	-	726
RA CFM	-	2375
OA CFM	1500	1605
RL Voltage	-	210/211/211
RL Amperage	-	8.9/8.2/8.8
OA Damper Position	-	5.00 DCV
Brake Horse Power	-	UTO

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.76"
Fan Suction SP	-	-0.99"
Fan Discharge SP	-	0.53"
Total ESP	-	1.29"
Fan Total SP	-	1.52"

Diffuser Supply (GRD)

RTU6 / KITCHEN

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	RISER ROOM	SC1	4X7	150	0.194	01	0	187	124.7
SGRD2	BOH	SB1	10"	150	1	443	450	455	303.3
SGRD3	KITCHEN	SB1	10"	225	1	349	351	324	144.0
SGRD4	KITCHEN	SB1	10"	375	1	392	371	374	99.7
SGRD5	KITCHEN	SB1	10"	375	1	418	410	429	114.4
SGRD6	KITCHEN	SB1	10"	375	1	432	430	429	114.4
SGRD7	OFFICE	SB1	10"	150	1	349	303	317	211.3
SGRD8	KITCHEN	SB1	10"	350	1	288	294	306	87.4
SGRD9	KITCHEN	SB1	10"	350	1	281	272	276	78.9
SGRD10	KITCHEN	SB1	10"	400	1	343	339	107	26.8
SGRD11	KITCHEN	SB1	10"	400	1	295	287	282	70.5
SGRD12	KITCHEN	SB1	10"	400	1	258	258	255	63.8
SGRD13	KITCHEN	SB1	10"	400	1	259	255	239	59.8

Completed By: Stephon Fisher on 08/10/2021

Asset	Area Served	Notes
SGRD7	OFFICE	Diffuser was add since AC-1 was not installed.
SGRD10	KITCHEN	Flex duct is kinked due to obstructions above ceiling. The flex duct has to run over the top of other ductwork

System/Unit: FAN - Exhaust

Asset: F7

AREA: RESTROOM

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE-AIRE
Model Num	NA	G-103-A-X
Serial Num	-	14878674
Type	-	DOWNBLAST

Test Data		
	Design	Actual
CFM	600	1062
System SetPt	-	(1)
RL Voltage	-	118
RL Amperage	-	3.4
Total ESP	-	0.34"

Motor Data		
	Design	Actual
Motor MFG	-	NL
Frame	-	48Y
Horsepower	-	1/4
Motor Rpm	-	1725
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	3.6
Service Factor	-	1.0

Completed By: Stephon Fisher on 09/01/2021

Notes: (1) Existing fan is minimized at the speed dial. Speed dial located in riser room.

Diffuser Ret/Exh (GRD)

F7 / RESTROOM

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
EGRD1	RESTROOM	EA1	14X14	300	1	517	512	512	170.7
EGRD2	RESTROOM	EA1	14X14	300	1	564	550	550	183.3

Completed By: Greg O'Day on 08/10/2021

Asset	Area Served	Notes

Asset: KEF1

AREA: HOOD 1

Unit Data		
	Design	Actual
MFG	NA	CAPTIVIVE AIRE
Model Num	NA	DU85HFA
Serial Num	-	4633218
Type	-	UPBLAST

Test Data		
	Design	Actual
CFM	1500	1556
System SetPt	-	62%
RL Voltage	-	209
RL Amperage	-	4.8
Total ESP	-	(2)

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NL
Horsepower	-	1.0
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	208
Amperage (rated)	-	6.9
Service Factor	-	NL

Completed By: Greg O'Day on 09/01/2021

- Notes: (1) ITEM 21.1
 (2) A frame ladders were removed from larger roof. No access to side roof.

System/Unit: FAN - Exhaust

Asset: KEF2

AREA: HOOD 2

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DU85HFA
Serial Num	-	4633218
Type	-	UPBLAST

Test Data		
	Design	Actual
CFM	1500	1572
System SetPt	-	62%
RL Voltage	-	209
RL Amperage	-	4.5
Total ESP	-	(2)

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NL
Horsepower	-	1
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	208
Amperage (rated)	-	6.9
Service Factor	-	NL

Completed By: Greg O'Day on 09/01/2021

- Notes: (1) Item 20.1
 (2) A frame ladders were removed from larger roof. No access to side roof.

Asset: KEF3

AREA: HOOD 3

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DU85HFA
Serial Num	-	4633218
Type	-	UPBLAST

Test Data		
	Design	Actual
CFM	1500	1647
System SetPt	-	73%
RL Voltage	-	209
RL Amperage	-	4.4
Total ESP	-	(2)

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NL
Horsepower	-	1.0
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	208
Amperage (rated)	-	6.9
Service Factor	-	NL

Completed By: Greg O'Day on 09/01/2021

- Notes: (1) Item 19.1
 (2) A frame ladders were removed from larger roof. No access to side roof.

System/Unit: FAN - Exhaust

Asset: KEF4

AREA: HOOD 4

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE-AIRE
Model Num	NA	DU85HFA
Serial Num	-	4633218
Type	-	UPBLAST

Test Data		
	Design	Actual
CFM	1912	1835
System SetPt	-	62%
RL Voltage	-	208
RL Amperage	-	4.9
Total ESP	-	1.14"

Motor Data		
	Design	Actual
Motor MFG	-	TELCOGREEN
Frame	-	NL
Horsepower	-	1
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	208-277
Amperage (rated)	-	6.9
Service Factor	-	NL

Completed By: Greg O'Day on 09/01/2021

Notes: (1) Item 22.1

Asset: KEF5

AREA: HOOD 5

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DU180HFA
Serial Num	-	4633218
Type	-	UPBLAST

Test Data		
	Design	Actual
CFM	2383	2229
System SetPt	-	63.7 HZ
RL Voltage	-	209/209/209
RL Amperage	-	4.6/4.8/5.2
Total ESP	-	1.17"

Motor Data		
	Design	Actual
Motor MFG	-	NEMA
Frame	-	184T
Horsepower	-	2
Motor Rpm	-	1165
Phase	-	3
Voltage (rated)	-	230/460
Amperage (rated)	-	7.51/3.76
Service Factor	-	1.0

Completed By: Greg O'Day on 09/01/2021

Notes: (1) Item 69.1

System/Unit: FAN - Exhaust

Asset: KEF6

AREA: HOOD 6

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	CASRE18DD
Serial Num	-	4633218
Type	-	UTILITY SET

Test Data		
	Design	Actual
CFM	3150	1903
System SetPt	-	57.2 HZ
RL Voltage	-	209/209/209
RL Amperage	-	9.0 VFD
Total ESP	-	UTO

Motor Data		
	Design	Actual
Motor MFG	-	WEG
Frame	-	56HZ
Horsepower	-	3
Motor Rpm	-	1735
Phase	-	3
Voltage (rated)	-	208-230/460
Amperage (rated)	-	8.7-7.94/3.97
Service Factor	-	1.15

Completed By: Greg O'Day on 09/03/2021

- Notes:
- (1) Item 90.1
 - (2) Per Captive Aire Engineer and Start up, due to the back-to-back 90deg turns out the top of the hood is creating a system effect on the hood that is reducing airflow. Hood has 100% capture.

System/Unit: FAN - Exhaust

Asset: KEF7

AREA: HOOD 7

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DU180HFA
Serial Num	-	4633218
Type	-	UPBLAST

Test Data		
	Design	Actual
CFM	2938	2752
System SetPt	-	47.4 HZ
RL Voltage	-	230/230/230
RL Amperage	-	7.3 VFD
Total ESP	-	1.19"

Motor Data		
	Design	Actual
Motor MFG	-	NEMA
Frame	-	182T
Horsepower	-	3
Motor Rpm	-	1755
Phase	-	3
Voltage (rated)	-	230/460
Amperage (rated)	-	8.80/4.30
Service Factor	-	1.15

Completed By: Greg O'Day on 09/01/2021

Notes: (1) Item 104.1

Asset: KEF8

AREA: HOOD 8

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DU50HFA
Serial Num	-	4633218
Type	-	UPBLAST

Test Data		
	Design	Actual
CFM	788	724
System SetPt	-	80%
RL Voltage	-	208
RL Amperage	-	2.8
Total ESP	-	1.31"

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NL
Horsepower	-	1/2
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	208
Amperage (rated)	-	3.8
Service Factor	-	NL

Completed By: Greg O'Day on 09/01/2021

Notes: (1) Item 140.1

Asset: KEF9

AREA: HOOD 9

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DU50HFA
Serial Num	-	4633218
Type	-	UPBLAST

Test Data		
	Design	Actual
CFM	700	632
System SetPt	-	78%
RL Voltage	-	208
RL Amperage	-	3.2
Total ESP	-	1.03

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NL
Horsepower	-	1/2
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	208
Amperage (rated)	-	3.8
Service Factor	-	NL

Completed By: Greg O'Day on 09/01/2021

Notes: (1) Item 143.1

System/Unit: FAN - Exhaust

Asset: KEF10

AREA: HOOD 10

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DU50HFA
Serial Num	-	4633218
Type	-	UPBLAST

Test Data		
	Design	Actual
CFM	1325	1197
System SetPt	-	100%
RL Voltage	-	115
RL Amperage	-	5.2
Total ESP	-	(1)

Motor Data		
	Design	Actual
Motor MFG	-	TELCOGREEN
Frame	-	NL
Horsepower	-	1/2
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	115VAC
Amperage (rated)	-	6.3
Service Factor	-	NL

Completed By: Greg O'Day on 09/01/2021

Notes: (1) Fan curb is sealed. Unable to measure static pressure

Asset: MUA1

AREA: HOOD 1 & 2

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	MUA	A1-D.250.18Z
Serial Num	-	4633218
Type	-	MAU
Configuration	-	VERTICAL

Test Data		
	Design	Actual
CFM	2400	2702
SF RPM	-	DD
SF System SetPt	-	30%
RL Voltage	-	UTO
RL Amperage	-	UTO

Motor Data		
	Design	Actual
Motor MFG	-	(1)
Frame	-	(1)
Horsepower	-	5.0
Motor Rpm	-	(1)
Phase	-	3
Voltage (rated)	-	208
Amperage (rated)	-	9.6
Service Factor	-	(1)

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD
Motor Bore Size	-	DD
Motor Sheave SetPt	-	DD
Fan Sheave Size	-	DD
Fan Sheave Bore	-	DD
Belt CL Distance	-	DD
Num of Belts	-	DD
Belt Size	-	DD

Completed By: Greg O'Day on 09/03/2021

- Notes:
- (1) Motor data taken from unit label
 - (2) ECM fan. Power runs from breaker to motor. No safe spot to measure amps/volts.
 - (3) Per Captive Aire Engineer and Start up, MAU was left high to compensate for MAU 4 to maintain positive building pressure. No effect on the performance of the hood.

Asset: MUA2

AREA: HOOD 3 & 4

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	MUA	A1-D.250.18Z
Serial Num	-	4633218
Type	-	MAU
Configuration	-	VERTICAL

Test Data		
	Design	Actual
CFM	2730	3208
SF RPM	-	DD
SF System SetPt	-	40%
RL Voltage	-	UTO
RL Amperage	-	UTO

Motor Data		
	Design	Actual
Motor MFG	-	(1)
Frame	-	(1)
Horsepower	-	5.0
Motor Rpm	-	(1)
Phase	-	3
Voltage (rated)	-	208
Amperage (rated)	-	9.6
Service Factor	-	(1)

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD
Motor Bore Size	-	DD
Motor Sheave SetPt	-	DD
Fan Sheave Size	-	DD
Fan Sheave Bore	-	DD
Belt CL Distance	-	DD
Num of Belts	-	DD
Belt Size	-	DD

Completed By: Greg O'Day on 09/03/2021

- Notes:
- (1) Motor data taken from unit label
 - (2) ECM fan. Power runs from breaker to motor. No safe spot to measure amps/volts.
 - (3) Per Captive Aire Engineer and Start up, MAU was left high to compensate for MAU 4 to maintain positive building pressure. No effect on the performance of the hood.

Asset: MUA3

AREA: HOOD 5

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	MUA	A1-D.250-15D
Serial Num	-	4633218
Type	-	MUA
Configuration	-	VERTICAL

Test Data		
	Design	Actual
CFM	1774	1888
SF RPM	-	DD
SF System SetPt	-	55.6 HZ
RL Voltage	-	209/209/209
RL Amperage	-	3.0 VFD

Motor Data		
	Design	Actual
Motor MFG	-	(1)
Frame	-	(1)
Horsepower	-	1.5
Motor Rpm	-	(1)
Phase	-	3
Voltage (rated)	-	208
Amperage (rated)	-	4.4
Service Factor	-	(1)

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD
Motor Bore Size	-	DD
Motor Sheave SetPt	-	DD
Fan Sheave Size	-	DD
Fan Sheave Bore	-	DD
Belt CL Distance	-	DD
Num of Belts	-	DD
Belt Size	-	DD

Completed By: Greg O'Day on 09/03/2021

Notes: (1) Motor data taken from unit label

Asset: MUA4

AREA: HOOD 6 & 7

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	MUA	A2-D.500-20D
Serial Num	-	4633218
Type	-	MUA
Configuration	-	VERTICAL

Test Data		
	Design	Actual
CFM	5175	3717
SF RPM	-	DD
SF System SetPt	-	75.0 HZ
RL Voltage	-	209/209/209
RL Amperage	-	14.0 VFD

Motor Data		
	Design	Actual
Motor MFG	-	(1)
Frame	-	(1)
Horsepower	-	5.0
Motor Rpm	-	(1)
Phase	-	3
Voltage (rated)	-	208
Amperage (rated)	-	15.0
Service Factor	-	(1)

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD
Motor Bore Size	-	DD
Motor Sheave SetPt	-	DD
Fan Sheave Size	-	DD
Fan Sheave Bore	-	DD
Belt CL Distance	-	DD
Num of Belts	-	DD
Belt Size	-	DD

Completed By: Greg O'Day on 09/03/2021

- Notes: (1) Motor data taken from unit label
 (2) Due to low flow on KEF-6 the airflow was set by Captive Aire to maximize hood performance.

Asset: MUA5

AREA: HOOD 8 & 9

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	MUA	D76
Serial Num	-	4633218
Type	-	MUA
Configuration	-	VERTICAL

Test Data		
	Design	Actual
CFM	1230	1369
SF RPM	-	1536
SF System SetPt	-	NA
RL Voltage	-	208/209/209
RL Amperage	-	3.5/3.5/3.5

Motor Data		
	Design	Actual
Motor MFG	-	[1]
Frame	-	[1]
Horsepower	-	1/2
Motor Rpm	-	[1]
Phase	-	3
Voltage (rated)	-	208
Amperage (rated)	-	4.6
Service Factor	-	[1]

Drive Data		
	Design	Actual
Motor Sheave Size	-	1VP50
Motor Bore Size	-	5/8
Motor Sheave SetPt	-	
Fan Sheave Size	-	AK39
Fan Sheave Bore	-	3/4
Belt CL Distance	-	10.5
Num of Belts	-	1
Belt Size	-	AX31

Completed By: Andrew Becerra on 10/15/2021

Notes: [1] Motor label not accessible
 [2] Per Captive Aire airflow was left high to compensate for MAU4

System/Unit: Kitchen Hood Type I

Asset: HD1

AREA: ITEM 19

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	3624 ND-2 PSP-F
Job / Serial Num	-	4633218
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	80	80
Hood Width	36	36
Supply Plenum Type	PSP	PSP
Supply Plenum Width	16	16
Supply Plenum Length	80	80

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	-	20X16
Filter Qty 1	-	4
Filter AK factor size 1	2.08	2.08
Filter Total AK Area	8.32	8.32
Filter1 FPM	-	156
Filter2 FPM	-	191
Filter3 FPM	-	217
Filter4 FPM	-	184
Filter5 FPM	-	NA
Filter6 FPM	-	NA
Filter7 FPM	-	NA
Filter8 FPM	-	NA
Filter9 FPM	-	NA
Filter Ave FPM(corr)	-	187
CFM	1500	1556

Cooking Equipment		
	Design	Actual
Item 1	-	SMOKER
Item 2	-	NA
Item 3	-	NA
Item 4	-	NA
Item 5	-	NA

Test Data Supply		
	Design	Actual
AK factor	1	1
Total AK Area	8.89	8.89
Kv factor (Vel)	0.92	0.92
Num of Readings	-	6
Reading1 FPM	-	184
Reading2 FPM	-	152
Reading3 FPM	-	158
Reading4 FPM	-	140
Reading5 FPM	-	112
Reading6 FPM	-	174
Reading7 FPM	-	NA
Reading8 FPM	-	NA
Reading9 FPM	-	NA
Reading10 FPM	-	NA
Reading11 FPM	-	NA
Reading12 FPM	-	NA
Reading13 FPM	-	NA
Reading14 FPM	-	NA
Ave FPM(corr)	-	141
CFM	1200	1253

Performance Data		
	Design	Actual
Exh-Supply Net CFM	300	303
Smoke Generation Type	-	NA
Cooking Equip Heat On	-	YES
Hood Capture %	-	NA

General		
	Design	Actual
Third Party Witness	-	NA
Third Party Company	-	NA
Tech Witness	-	NA
Tech Company	-	NA

Completed By: Greg O'Day on 09/03/2021

Notes:

System/Unit: Kitchen Hood Type I

Asset: HD2

AREA: ITEM 20

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	3624 ND-2 PSP-F
Job / Serial Num	-	4633218
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	80	80
Hood Width	36	36
Supply Plenum Type	PSP	PSP
Supply Plenum Width	16	16
Supply Plenum Length	80	80

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	-	20X16
Filter Qty 1	-	4
Filter AK factor size 1	2.08	2.08
Filter Total AK Area	8.32	8.32
Filter1 FPM	-	175
Filter2 FPM	-	189
Filter3 FPM	-	207
Filter4 FPM	-	185
Filter5 FPM	-	NA
Filter6 FPM	-	NA
Filter7 FPM	-	NA
Filter8 FPM	-	NA
Filter9 FPM	-	NA
Filter Ave FPM(corr)	-	189
CFM	1500	1572

Cooking Equipment		
	Design	Actual
Item 1	-	SMOKER
Item 2	-	NA
Item 3	-	NA
Item 4	-	NA
Item 5	-	NA

Test Data Supply		
	Design	Actual
AK factor	1	1
Total AK Area	8.89	8.89
Kv factor (Vel)	0.92	0.92
Num of Readings	-	6
Reading1 FPM	-	160
Reading2 FPM	-	194
Reading3 FPM	-	179
Reading4 FPM	-	195
Reading5 FPM	-	148
Reading6 FPM	-	185
Reading7 FPM	-	NA
Reading8 FPM	-	NA
Reading9 FPM	-	NA
Reading10 FPM	-	NA
Reading11 FPM	-	NA
Reading12 FPM	-	NA
Reading13 FPM	-	NA
Reading14 FPM	-	NA
Ave FPM(corr)	-	163
CFM	1200	1449

Performance Data		
	Design	Actual
Exh-Supply Net CFM	300	123
Smoke Generation Type	-	NA
Cooking Equip Heat On	-	YES
Hood Capture %	-	NA

General		
	Design	Actual
Third Party Witness	-	NA
Third Party Company	-	NA
Tech Witness	-	NA
Tech Company	-	NA

Completed By: Greg O'Day on 09/03/2021

Notes: [1] Per Captive Aire supply airflow was left high to compensate for MAU4. No effect on hood capture.

System/Unit: Kitchen Hood Type I

Asset: HD3

AREA: ITEM 21

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	3624 ND-2 PSP-F
Job / Serial Num	-	4633218
Type	TYPE I CANOPY	TYPE 1 CANOPY
Hood length	80	80
Hood Width	36	36
Supply Plenum Type	PSP	PSP
Supply Plenum Width	16	16
Supply Plenum Length	80	80

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	-	20X16
Filter Qty 1	-	4
Filter AK factor size 1	2.08	2.08
Filter Total AK Area	8.32	8.32
Filter1 FPM	-	213
Filter2 FPM	-	188
Filter3 FPM	-	171
Filter4 FPM	-	213
Filter5 FPM	-	201
Filter6 FPM	-	207
Filter7 FPM	-	NA
Filter8 FPM	-	NA
Filter9 FPM	-	NA
Filter Ave FPM(corr)	-	198
CFM	1500	1647

Cooking Equipment		
	Design	Actual
Item 1	-	SMOKER
Item 2	-	NA
Item 3	-	NA
Item 4	-	NA
Item 5	-	NA

Test Data Supply		
	Design	Actual
AK factor	1	1
Total AK Area	8.89	8.89
Kv factor (Vel)	0.92	0.92
Num of Readings	-	6
Reading1 FPM	-	206
Reading2 FPM	-	168
Reading3 FPM	-	162
Reading4 FPM	-	203
Reading5 FPM	-	188
Reading6 FPM	-	218
Reading7 FPM	-	NA
Reading8 FPM	-	NA
Reading9 FPM	-	NA
Reading10 FPM	-	NA
Reading11 FPM	-	NA
Reading12 FPM	-	NA
Reading13 FPM	-	NA
Reading14 FPM	-	NA
Ave FPM(corr)	-	176
CFM	1200	1565

Performance Data		
	Design	Actual
Exh-Supply Net CFM	300	82
Smoke Generation Type	-	NA
Cooking Equip Heat On	-	YES
Hood Capture %	-	NA

General		
	Design	Actual
Third Party Witness	-	NA
Third Party Company	-	NA
Tech Witness	-	NA
Tech Company	-	NA

Completed By: Greg O'Day on 09/03/2021

Notes: [1] Per Captive Aire supply airflow was left high to compensate for MAU4. No effect on hood capture.

System/Unit: Kitchen Hood Type I

Asset: HD4

AREA: ITEM 22

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	6024 ND-2 PSP-F
Job / Serial Num	-	4633218
Type	TYPE I CANOPY	TYPE 1 CANOPY
Hood length	78	78
Hood Width	60	60
Supply Plenum Type	PSP	PSP
Supply Plenum Width	14	14
Supply Plenum Length	115	115

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	-	20X16
Filter Qty 1	-	6
Filter AK factor size 1	2.08	2.08
Filter Total AK Area	12.48	12.48
Filter1 FPM	-	147
Filter2 FPM	-	159
Filter3 FPM	-	123
Filter4 FPM	-	167
Filter5 FPM	-	139
Filter6 FPM	-	148
Filter7 FPM	-	NA
Filter8 FPM	-	NA
Filter9 FPM	-	NA
Filter Ave FPM(corr)	-	147
CFM	1912	1835

Cooking Equipment		
	Design	Actual
Item 1	-	SMOKER
Item 2	-	NA
Item 3	-	NA
Item 4	-	NA
Item 5	-	NA

Test Data Supply		
	Design	Actual
AK factor	1	1
Total AK Area	11.18	11.18
Kv factor (Vel)	0.89	0.89
Num of Readings	-	8
Reading1 FPM	-	210
Reading2 FPM	-	172
Reading3 FPM	-	149
Reading4 FPM	-	190
Reading5 FPM	-	139
Reading6 FPM	-	158
Reading7 FPM	-	133
Reading8 FPM	-	168
Reading9 FPM	-	NA
Reading10 FPM	-	NA
Reading11 FPM	-	NA
Reading12 FPM	-	NA
Reading13 FPM	-	NA
Reading14 FPM	-	NA
Ave FPM(corr)	-	147
CFM	1530	1643

Performance Data		
	Design	Actual
Exh-Supply Net CFM	382	192
Smoke Generation Type	-	NA
Cooking Equip Heat On	-	YES
Hood Capture %	-	NA

General		
	Design	Actual
Third Party Witness	-	NA
Third Party Company	-	NA
Tech Witness	-	NA
Tech Company	-	NA

Completed By: Greg O'Day on 09/03/2021

Notes:

System/Unit: Kitchen Hood Type I

Asset: HD5

AREA: ITEM 69

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	6024 ND-2 PSP-F
Job / Serial Num	-	4633218
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	133	133
Hood Width	60	60
Supply Plenum Type	PSP	PAP
Supply Plenum Width	14	14
Supply Plenum Length	145	145

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	-	16X16
Filter Qty 1	-	8
Filter AK factor size 1	1.62	1.62
Filter Total AK Area	12.96	12.96
Filter1 FPM	-	150
Filter2 FPM	-	142
Filter3 FPM	-	170
Filter4 FPM	-	219
Filter5 FPM	-	210
Filter6 FPM	-	180
Filter7 FPM	-	147
Filter8 FPM	-	156
Filter9 FPM	-	NA
Filter Ave FPM(corr)	-	172
CFM	2217	2229

Cooking Equipment		
	Design	Actual
Item 1	-	OVEN
Item 2	-	STOVE
Item 3	-	OVEN
Item 4	-	NA
Item 5	-	NA

Test Data Supply		
	Design	Actual
AK factor	1	1
Total AK Area	14.09	14.09
Kv factor (Vel)	0.89	0.89
Num of Readings	-	14
Reading1 FPM	-	158
Reading2 FPM	-	132
Reading3 FPM	-	111
Reading4 FPM	-	169
Reading5 FPM	-	122
Reading6 FPM	-	120
Reading7 FPM	-	170
Reading8 FPM	-	156
Reading9 FPM	-	127
Reading10 FPM	-	111
Reading11 FPM	-	168
Reading12 FPM	-	121
Reading13 FPM	-	161
Reading14 FPM	-	171
Ave FPM(corr)	-	134
CFM	1774	1888

Performance Data		
	Design	Actual
Exh-Supply Net CFM	443	341
Smoke Generation Type	-	45 SEC SMOKE CANDLE
Cooking Equip Heat On	-	YES
Hood Capture %	-	100

General		
	Design	Actual
Third Party Witness	-	GREG O'DAY
Third Party Company	-	NATIONAL TAB
Tech Witness	-	CLINT
Tech Company	-	CAPTIVE AIRE

Completed By: Andrew Becerra on 10/15/2021

Notes:

System/Unit: Kitchen Hood Type I

Asset: HD6

AREA: ITEM 90

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	6024 ND-2 PSP-F
Job / Serial Num	-	4633218
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	84	84
Hood Width	60	60
Supply Plenum Type	PSP	PSP
Supply Plenum Width	20	20
Supply Plenum Length	84	84

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	-	20X16
Filter Qty 1	-	5
Filter AK factor size 1	2.08	2.08
Filter Total AK Area	10.40	10.40
Filter1 FPM	-	159
Filter2 FPM	-	204
Filter3 FPM	-	196
Filter4 FPM	-	188
Filter5 FPM	-	168
Filter6 FPM	-	NA
Filter7 FPM	-	NA
Filter8 FPM	-	NA
Filter9 FPM	-	NA
Filter Ave FPM(corr)	-	183
CFM	3150	1903

Cooking Equipment		
	Design	Actual
Item 1	-	GRILL
Item 2	-	NA
Item 3	-	NA
Item 4	-	NA
Item 5	-	NA

Test Data Supply		
	Design	Actual
AK factor	1	1
Total AK Area	11.67	11.67
Kv factor (Vel)	0.89	0.89
Num of Readings	-	6
Reading1 FPM	-	43
Reading2 FPM	-	36
Reading3 FPM	-	67
Reading4 FPM	-	81
Reading5 FPM	-	49
Reading6 FPM	-	97
Reading7 FPM	-	NA
Reading8 FPM	-	NA
Reading9 FPM	-	NA
Reading10 FPM	-	NA
Reading11 FPM	-	NA
Reading12 FPM	-	NA
Reading13 FPM	-	NA
Reading14 FPM	-	NA
Ave FPM(corr)	-	55
CFM	2575	642

Performance Data		
	Design	Actual
Exh-Supply Net CFM	575	1261
Smoke Generation Type	-	45 SEC SMOKE CANDLE
Cooking Equip Heat On	-	YES
Hood Capture %	-	100

General		
	Design	Actual
Third Party Witness	-	CLINT
Third Party Company	-	CAPTIVE AIRE
Tech Witness	-	GREG O'DAY
Tech Company	-	NATIONAL TAB

Completed By: Andrew Becerra on 10/15/2021

Notes: [1] Per Captive Aire Engineer and Start up tech, due to the back-to-back 90deg turns out the top of the hood is creating a system effect on the hood that is reducing airflow. Hood has 100% capture.
 [2] Unable to push supply airflow from hood 7.

System/Unit: Kitchen Hood Type I

Asset: HD7

AREA: ITEM 69

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	6024 ND-2 PSP-F
Job / Serial Num	-	4633218
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	150	150
Hood Width	60	60
Supply Plenum Type	PSP	PSP
Supply Plenum Width	18	18
Supply Plenum Length	150	150

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	-	20X16
Filter Qty 1	-	9
Filter AK factor size 1	2.08	2.08
Filter Total AK Area	18.72	18.72
Filter1 FPM	-	109
Filter2 FPM	-	123
Filter3 FPM	-	154
Filter4 FPM	-	140
Filter5 FPM	-	134
Filter6 FPM	-	155
Filter7 FPM	-	163
Filter8 FPM	-	176
Filter9 FPM	-	168
Filter Ave FPM(corr)	-	147
CFM	2938	2752

Cooking Equipment		
	Design	Actual
Item 1	-	OVEN
Item 2	-	OVEN
Item 3	-	FRYER
Item 4	-	NA
Item 5	-	NA

Test Data Supply		
	Design	Actual
AK factor	1	1
Total AK Area	18.75	18.75
Kv factor (Vel)	0.88	0.88
Num of Readings	-	12
Reading1 FPM	-	219
Reading2 FPM	-	152
Reading3 FPM	-	204
Reading4 FPM	-	183
Reading5 FPM	-	151
Reading6 FPM	-	185
Reading7 FPM	-	187
Reading8 FPM	-	181
Reading9 FPM	-	195
Reading10 FPM	-	208
Reading11 FPM	-	165
Reading12 FPM	-	206
Reading13 FPM	-	NA
Reading14 FPM	-	NA
Ave FPM(corr)	-	164
CFM	2600	3075

Performance Data		
	Design	Actual
Exh-Supply Net CFM	338	323
Smoke Generation Type	-	45 SEC SMOKE CANDLE
Cooking Equip Heat On	-	YES
Hood Capture %	-	100

General		
	Design	Actual
Third Party Witness	-	CLINT
Third Party Company	-	CAPTIVE AIRE
Tech Witness	-	GREG ODAY
Tech Company	-	NATIONAL TAB

Completed By: Andrew Becerra on 10/15/2021

Notes: [1] Per Captive Aire unable to push supply airflow to hood 6. Left high to compensate for hood 6. No effect on hood capture.

System/Unit: Kitchen Hood Type I

Asset: HD8

AREA: ITEM 140

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	5424 ND-2-PSP-F
Job / Serial Num	-	4633218
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	54	54
Hood Width	54	54
Supply Plenum Type	PSP	PSP
Supply Plenum Width	14	14
Supply Plenum Length	54	54

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	SOLO
Filter Size 1	-	16X16
Filter Qty 1	-	3
Filter AK factor size 1	1.62	1.62
Filter Total AK Area	4.86	4.86
Filter1 FPM	-	148
Filter2 FPM	-	151
Filter3 FPM	-	149
Filter4 FPM	-	NA
Filter5 FPM	-	NA
Filter6 FPM	-	NA
Filter7 FPM	-	NA
Filter8 FPM	-	NA
Filter9 FPM	-	NA
Filter Ave FPM(corr)	-	149
CFM	788	724

Cooking Equipment		
	Design	Actual
Item 1	-	OVEN
Item 2	-	NA
Item 3	-	NA
Item 4	-	NA
Item 5	-	NA

Test Data Supply		
	Design	Actual
AK factor	1	1
Total AK Area	5.25	5.26
Kv factor (Vel)	0.89	0.89
Num of Readings	-	4
Reading1 FPM	-	118
Reading2 FPM	-	135
Reading3 FPM	-	130
Reading4 FPM	-	121
Reading5 FPM	-	NA
Reading6 FPM	-	NA
Reading7 FPM	-	NA
Reading8 FPM	-	NA
Reading9 FPM	-	NA
Reading10 FPM	-	NA
Reading11 FPM	-	NA
Reading12 FPM	-	NA
Reading13 FPM	-	NA
Reading14 FPM	-	NA
Ave FPM(corr)	-	112
CFM	630	589

Performance Data		
	Design	Actual
Exh-Supply Net CFM	158	135
Smoke Generation Type	-	45 SEC SMOKE CANDLE
Cooking Equip Heat On	-	YES
Hood Capture %	-	100%

General		
	Design	Actual
Third Party Witness	-	NA
Third Party Company	-	NA
Tech Witness	-	ANDREW DECERRA
Tech Company	-	NATIONAL TAB

Completed By: Greg O'Day on 09/03/2021

Notes:

System/Unit: Kitchen Hood Type I

Asset: HD9

AREA: ITEM 143

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	5424 ND-2-PSP-F
Job / Serial Num	-	4633218
Type	TYPE I CANOPY	TYPE I CANOPY
Hood length	48	48
Hood Width	54	54
Supply Plenum Type	PSP	PSP
Supply Plenum Width	12	12
Supply Plenum Length	60	60

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	-	16X20
Filter Qty 1	-	2
Filter AK factor size 1	2.08	2.08
Filter Total AK Area	4.16	4.16
Filter1 FPM	-	155
Filter2 FPM	-	149
Filter3 FPM	-	NA
Filter4 FPM	-	NA
Filter5 FPM	-	NA
Filter6 FPM	-	NA
Filter7 FPM	-	NA
Filter8 FPM	-	NA
Filter9 FPM	-	NA
Filter Ave FPM(corr)	-	152
CFM	700	632

Cooking Equipment		
	Design	Actual
Item 1	-	FRYER
Item 2	-	NA
Item 3	-	NA
Item 4	-	NA
Item 5	-	NA

Test Data Supply		
	Design	Actual
AK factor	1	1
Total AK Area	5.0	5.0
Kv factor (Vel)	0.87	0.87
Num of Readings	-	4
Reading1 FPM	-	176
Reading2 FPM	-	165
Reading3 FPM	-	180
Reading4 FPM	-	193
Reading5 FPM	-	NA
Reading6 FPM	-	NA
Reading7 FPM	-	NA
Reading8 FPM	-	NA
Reading9 FPM	-	NA
Reading10 FPM	-	NA
Reading11 FPM	-	NA
Reading12 FPM	-	NA
Reading13 FPM	-	NA
Reading14 FPM	-	NA
Ave FPM(corr)	-	156
CFM	600	780

Performance Data		
	Design	Actual
Exh-Supply Net CFM	100	--148
Smoke Generation Type	-	SMOKE CANDLE
Cooking Equip Heat On	-	YES
Hood Capture %	-	100

General		
	Design	Actual
Third Party Witness	-	NA
Third Party Company	-	NA
Tech Witness	-	ANDREW BECERRA
Tech Company	-	NATIONAL TAB

Completed By: Andrew Becerra on 10/15/2021

Notes: [1] Per Captive Aire supply airflow was left high to compensate for MAU4. No effect on hood capture.

System/Unit: Kitchen Hood Type II

Asset: HD10

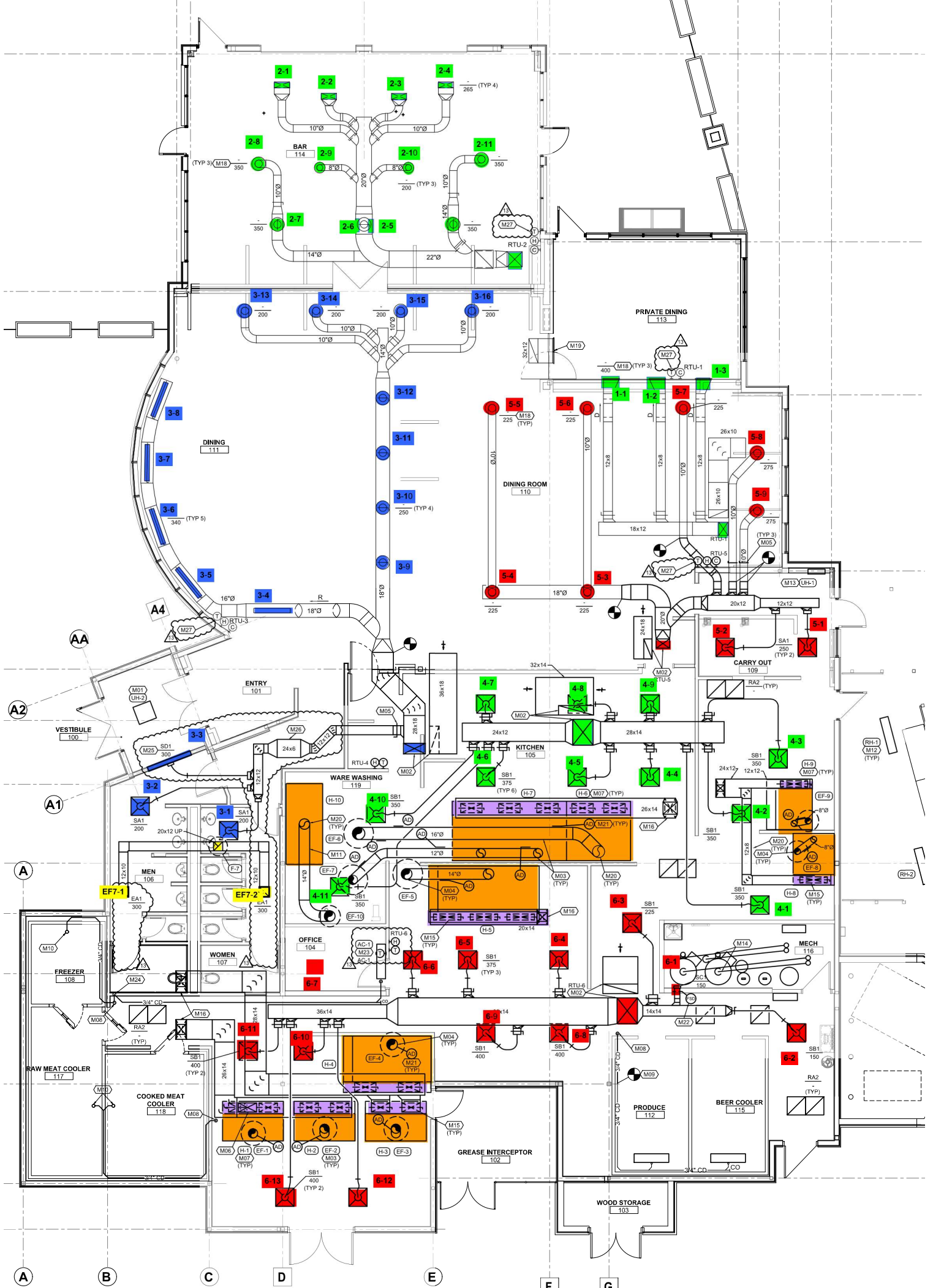
AREA: ITEM 237

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE-AIRE
Model Num	NA	4824 VHB G
Serial Num	-	4633218
Type	TYPE II CANOPY	TY II CANOPY
Hood length	106	106
Hood Width	48	48

Test Data		
	Design	Actual
Exhaust CFM	1325	1197

Completed By: Andrew Becerra on 10/15/2021

Notes:



NEBB Fundamental Formulas

NEBB ABBREVIATIONS

A = Area (ft ²) IP, (m ²) SI	M = Mass (lb) IP, (kg) SI
ACH = Air Changes per Hour	ma = Mixed Air
A _k = Effective Area	m = meter (metre)
AV = Average	m ³ /s = Volumetric Flow: Cubic Meters Per Second
BHP = Brake Horsepower (IP) HP	NLA = No Load Amperage
BP = Brake Power (SI) kW	NPSHA = Net Positive Suction Head Available
Btu = British Thermal Unit	oa = Outside Air
Btu/h = Btuh = BTUH = BTU/Hour	% _{oa} = % of Outside Air
ϕ = Center Distance (used in belt formula)	Ω = Ohm
°C = Degrees Celsius, °C	P = Pressure
C = Friction Loss Coefficient (For Duct Fittings)	P _a = Atmospheric Pressure
CCF = 100 Cubic Feet	P _{ab} = Absolute Pressure (Atmospheric Pressure + Gauge Pressure)
CFM = Volumetric Flow: Cubic Feet Per Minute	Pa = Pascals, Pressure SI
C _p = Specific Heat	π = 3.14
C _v = Flow Constant (IP)	PD = Sheave Pitch Diameter
ρ = Density (lb/ft ³) IP, (kg/m ³) SI	P _ϕ = Pressure at Pump Centerline
d = Diameter (in.) IP, (mm) SI	ppm = parts per million
Δ = Difference or Change (Final - Initial)	psi = Pounds Per Square Inch
d _{imp} = Impeller Diameter	psia = Pounds Per Square Inch Absolute
E = Volts	psig = Pounds Per Square Inch Gauge
Eff = Efficiency	P _{vp} = Absolute Vapor Pressure
EP = Pump Efficiency	Q (flow) = Volumetric Fluid Flow Rate: (i.e. CFM, GPM, m ³ /s, l/s, etc.)
°F = Degrees Fahrenheit, °F	Q (heat) = Heat Flow Rate (BTU/Hour) IP, (W or kW) SI
f = Friction Factor	°R = °Rankin = Degrees Rankin, °R
FLA = Full Load Amps	r = Radius (in) IP, (mm) SI
fpm = Feet per Minute (fpm)	% _{ra} = % of Return Air
ft = Foot	R = Resistance
g = Acceleration of Gravity	ra = Return Air
gal = Gallons	rad = Radians
GPM = Gallons Per Minute (GPM)	RH = Relative Humidity
h = Enthalpy (BTU/lb dry air) IP, (kJ/kg dry air) SI	RPM = Revolutions Per Minute
H = Head (in wc, ft wc, psi) IP, (Pa, kPa) SI	R _{value} = Thermal Resistance
Hg = Mercury	s = second
h _{ma} = Mixed Air Enthalpy	SHR = Sensible Heat Ratio
h _{oa} = Outside Air Enthalpy	SME = Sash Movement Effect Performance Rating (SME-XX yyy)
HP = Horsepower	SP = Static Pressure
hr = Hour	Sp Gr = Specific Gravity (for water use 1.00)
h _{ra} = Return Air Enthalpy	T = Temperature
HT = Height (in) IP, (mm) SI	T _a = Absolute Temperature (460° + T) or °R
I = Amps	T _{ma} = Mixed Air Temperature
J = Joules	T _{oa} = Outside Air Temperature
K = Kelvin, K	TP = Total Pressure
K _v = Flow constant (SI)	T _{ra} = Return Air Temperature
kg = Kilogram	TS = Tip Speed (fpm) IP, (m/s) SI
kJ = Kilojoule	U = Heat Transfer Coefficient
kPa = Kilopascal	μ = viscosity, dynamic
kW = Kilowatt = 1000 Watts	V = Velocity
l = Liter (Litre)	VP = Velocity Pressure
l/s = Volumetric Flow: Liters Per Second	W = Watt
lb = Pounds	WD = Width (in) IP, (mm) SI
lm = Lumens	wg = wc = water gauge = water column
ln = natural log	WHP = Water Horsepower (IP)
LG = Length (in) IP, (mm) SI	WP = Water Power (SI)
lx = Lux	ω = Humidity Ratio (lb or grains of water/lb of dry air) (g H ₂ O/kg dry air)



National TAB

Testing, Adjusting, and Balancing Equipment



Function		Range	Minimum Accuracy	Instrument Information	Calibration Date	Date Due
AIR	AIR PRESSURE	0 in wg to 10 in wg	2% +/- 0.001 in wg	Shortridge ADM-860 M99048	8/5/2021	8/5/2022
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	Shortridge ADM-860 M99048	8/5/2021	8/5/2022
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 5 % +/- 7 cfm	Alnor EBT Micromanometer EBT731 EBT732117009	4/21/2021	4/21/2022
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/18/2021	8/18/2022
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/18/2021	8/18/2022
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/18/2021	8/18/2022
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/18/2021	8/18/2022
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/18/2021	8/18/2022
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/18/2021	8/18/2022
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper SRH77A S/N 100516003	8/18/2021	8/18/2022
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Fluke 323 S/N 35491023WS	8/17/2021	8/17/2022
	AMPERAGE MEASUREMENT	0 Amperers to 100 Amperes	2 % reading +/- 5 digits	Fluke 323 S/N 35491023WS	8/17/2021	8/17/2022
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	Shimpo DT 207Lp S/N D1690029R	8/18/2021	8/18/2022