Report By:

National TAB
1329 E Kemper Rd, Ste 4210
Cincinnati, OH 45246

Report: **Test and Balance**
Date: **2/26/2019**

PROJECT

FREDDY'S - EDWARDSVILLE, IL

2204 TROY RD
EDWARDSVILLE, IL 62025

Client

Freddy's Frozen Custard & Steakburgers (CORPORATE)
260 N Rock Rd
Suite 200
Wichita, KS 67206

National TAB

Project: FREDDY'S - EDWARDSVILLE, IL

Table Of Contents

Deficiency List

Assigned Organization: National TAB

Status: Not Submitted

Asset:

PRIORITY (HIGH/LOW/INFO ONLY)	
HIGH	Existing RTU 3 and 4 are low on airflow. There is a dirt build up on the fan wheels and filters. The coil is blow through style and was not accessible for inspection. The filters are mesh style and should be replaced with disposable filters. Did not find spec that the cleanliess of existing equipment was in mechanical contractors scope so this issue will be evaluated during the Renew program.
LOW	New RTU-1 and 2 low voltage wiring not completed from OCP terminal at RTU's to thermstat to enable economizer while restaurant is occupied. A jumper wire was temporarily installed so balancing could be completed. But wiring needs to be completed.
LOW	Grease trough is not installed on KEF 1 or KEF 2.
INFO ONLY	Existing RTU 3 and 4 Outside air damper motors do not work, Removed from linkage and opend up to maximum allowable point. Dampers were manually set to this position. No further action required at this time.
INFO ONLY	The Dish hood is only set up to run while the dishwasher is runing. While the dish hood is running the building pressure is neutral to slightly negative. While the dish hood is not running the building pressure is neutral to slightly positive.

Notes/Comments:

Project Summary

Preface
The summary below provides a quick understanding of how well your HVAC systems balanced in respect to the design criteria. The summary concludes with a quick understanding of your building environment and possible suggestions for each of your systems after testing has been performed. Our focus is to work with the trades to remedy any issues or deficiencies during the actual field balancing and not after the balancing has occurred. Our focus is to achieve a positive environment and outcome. The level of success is determined by the availability of the trades, possible parts needed, or time constraints. Also, enclosed are pictures of building assets and items listed below that will provide your team with more insight

Facility Identification and TAB Requirements
The mechanical equipment to be tested, adjusted, and balanced includes: All Roof Top Units (RTU), All Exhaust Fans (EF), All Make Up Air Units (MUA), All Kitchen Hoods, and all associated air devices.

Constant Volume RTU's with Lay-In Ceiling Diffusers
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 +/-10% of the specified design. Each terminal diffuser was balanced to within +/-10% 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 to +/-10% 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 +/-10% of design criteria. Any EF's or MUA's that fell outside of this tolerance is noted throughout the report.

General 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 +/-10% of design. Each terminal device was balanced to within +/-10% of the design volume using the installed volume dampers. Any equipment that fell outside of this tolerance is noted throughout the report.

Final Building Tests
After completing the test and balance, the final building pressure was recorded at -0.008" AVE with all systems running and 0.010" AVE with the dishwasher not running" W.C. average. This pressure falls within the recommended tolerances by the International Mechanical Code of +0.02" W.C. to -0.02" W.C. The building is designed for a net positive pressure and this measurement coincides with that requirement. The dish hood is set to only run with the dish washer.
The hood capture was tested at the perimeter of the hood and the cook top level with the equipment heat "on" and 100% capture was observed.

NATIONAL TAB

National TAB NEBB JOE HERTENSTEIN CERTIFICATION 3629 Exp. 3/31/19 Air and Hydronic Testing

AIR BALANCE SCHEDULE

UNIT	AREA SERVED	HVAC SUPPLY		HVAC RETURN		HVAC OUTDOOR		OA %		HOOD MAKE-UP		HOOD EXHAUST		GENERAL EXH.	
		DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
RTU-1	KITCHEN	1600	1576	1300	1265	300	311	18.8%	19.7%						
RTU-2	KITCHEN	3000	3945	2200	3134	800	811	26.7%	20.6%						
XRTU-3	DINING	1750	1322	1450	1138	300	184	17.1%	13.9%						
XRTU-4	DINING	1750	1412	1450	1295	300	117	17.1%	8.3%						
MUA-1	KITCHEN HOODS									2743	2751				
EF-1	FRYER											2584	2713		
EF-2	GRIDDLE											775	758		
EF-3	DISH HOOD											525	521		
EF-1	RESTROOM													150	139
EF-2	RESTROOM													150	125
TOTALS		8100	8255	6400	6832	1700	1423			2743	2751	3884	3992	300	264

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	4443	4174
TOTAL EXHAUST	4184	4256
NET AIRFLOW	259	-82

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H20)
FRONT	[1]
SIDE	
REAR	[1]
AVERAGE	**[1]**

FINAL CHECKS

ACTUAL NET AIRFLOW COINCIDES WITH DESIGN: !

MEASURED PRESSURES COINCIDES WITH ACTUAL NET AIRFLOW: !

PRESSURE FALLS WITHIN IMC TOLERANCE OF +/-0.02" W.C. !

NOTES:

[1] -0.008" AVE WITH ALL SYSTEMS RUNNING / 0.010" AVE WITH THE DISH EF OFF. DISH EF IS SET TO ONLY RUN WHEN DISH WASHER IS RUNNING

RTU1

RTU2

XRTU3

XRTU4

MAU

KEF1

KEF2

KEF3

Ceiling EF Switch

HD1

HD2

HD3

HD4

Typ XRTU Filter

Typ XRTU OA

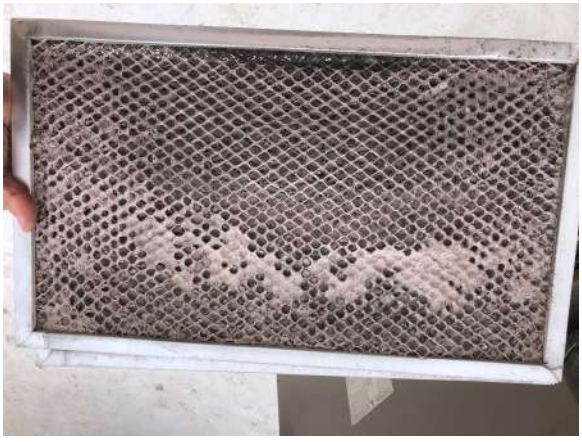
Typ XRTU OA

Typ XRTU Filter

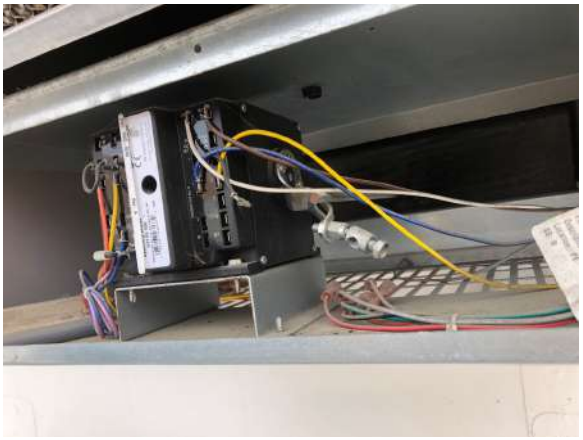
Typ XRTU Filter

XRTU Filter Band

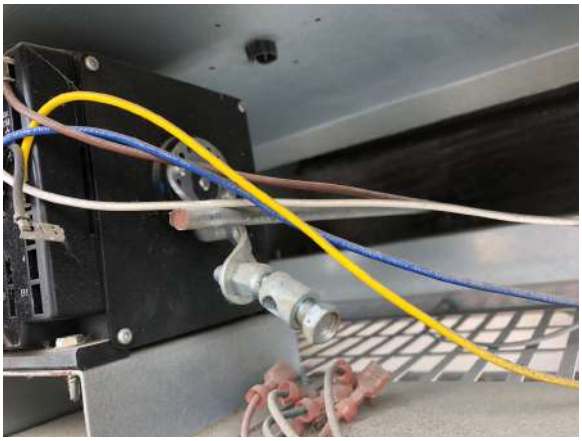
Typ XRTU Filters



Typ XRTU OA Damp



Typ XRTU Linkage



Typ XRTU Fan

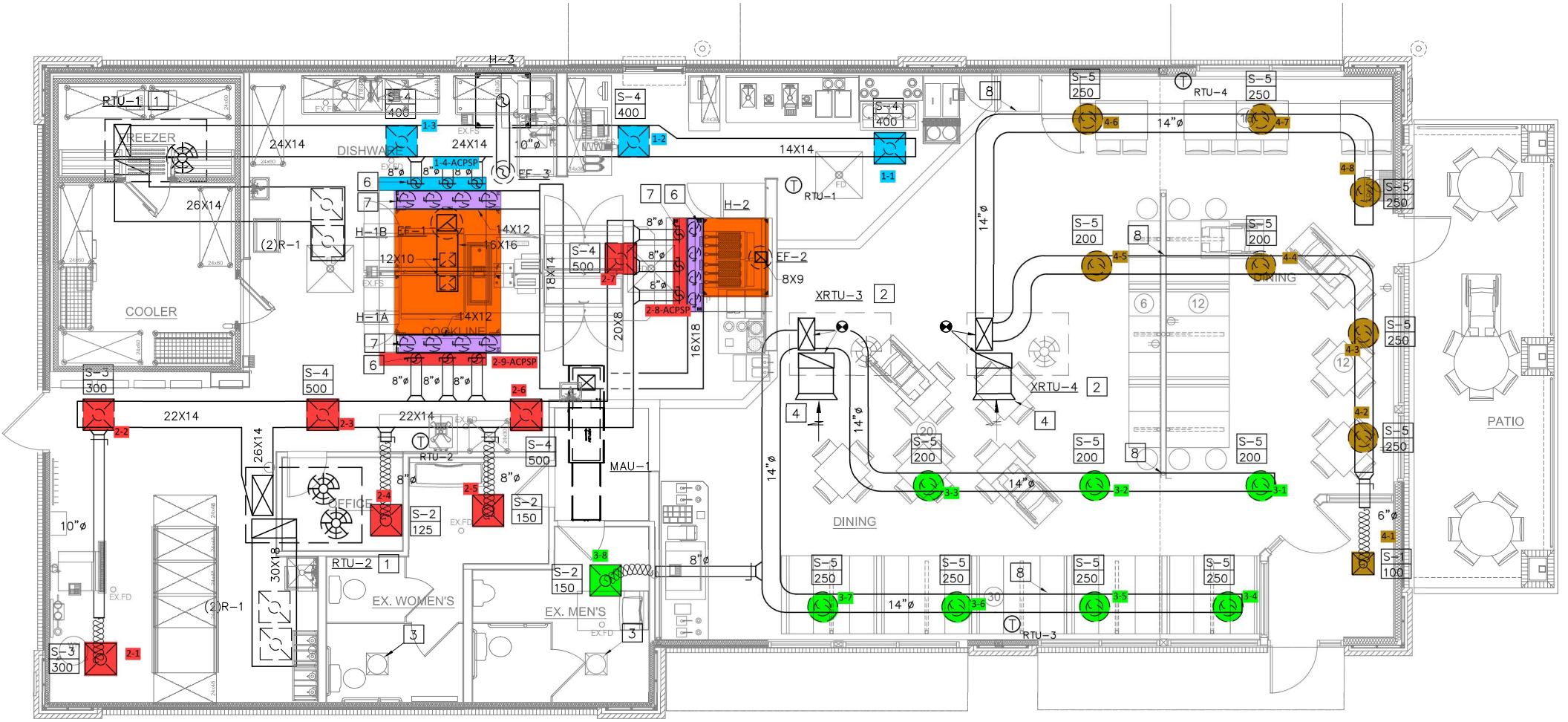
Left Thermostats

Right Thermostats

Jump B/t R and OCP

Typ Grease Trough

Front Of Store


RTU-1
FREEZER
COOLER
DISHWARE
COOK LINE
OFFICE
EX. WOMEN'S
EX. MEN'S
MAU-1
RTU-2
RTU-3
RTU-4
XRTU-3
XRTU-4
DINING
PATIO
EF-1
EF-2
EF-3
H-1A
H-1B
H-2
H-3
(2)R-1
24X14
26X14
22X14
14X14
14X12
16X16
12X10
18X14
20X8
16X18
26X14
30X18
8X9
10"ø
14"ø
8"ø
6"ø
S-4 400
S-4 500
S-3 300
S-2 125
S-2 150
S-5 250
S-5 200
S-5 100
1-1
1-2
1-3
1-4-ACPSP
2-1
2-2
2-3
2-4
2-5
2-6
2-7
2-8-ACPSP
2-9-ACPSP
3-1
3-2
3-3
3-4
3-5
3-6
3-7
3-8
4-1
4-2
4-3
4-4
4-5
4-6
4-7
4-8

TECH - STEP 1 INITIAL SITE WALKTHROUGH

Assigned Organization: National TAB

Status: Submitted

Asset:

INITIAL SITE WALKTHROUGH	
All diffusers and grilles are installed and match design?	Yes
All hood filters installed and accounted for?	Yes
Hoods are wired and have power?	Yes
Hood is free of alarms?	Yes
Thermostats have power?	Yes
Have trades/general contractor been notified about any issues and are they created on FaciliBuild?	NA

Notes/Comments:

TECH - STEP 2 UNIT DATA AND EVAL

Assigned Organization: National TAB

Status: Submitted

Asset:

UNIT DATA AND EVALUATION WHILE GATHERING UNIT DATA CHECK THE FOLLOWING:	
RTU's/AHU's	
Economizers are assembled and functional?	No
DCV Max damper opening position is set to minimum?	Yes
Free cooling enthalpy set point set for lowest setting (Typically "D")	Yes
Motors are all operating below the FLA rating?	Yes
Are belts tight?	Yes
If direct drive unit is the speed controller working.	Yes
Is gas piping installed and valves turned on?	Yes
Unit free of noticeable noise and vibration	Yes
EF's	
Rotation is correct?	Yes
Belts are tight?	Yes
Grease cup installed on hood fan?	Yes
Hinge kit installed installed on hood fan?	Yes
Lean fan back. Is grease duct installation adequate and is duct ran all the way to the base of the fan?	Yes
Flex conduit is long enough so that fan can be completely tilted back?	Yes
There is no major leakage around base of fan?	Yes
Is the motor operating below the motor FLA rating?	Yes
For restroom fan(s) is the back draft damper installed and can it fully open?	Yes
Unit free of noticeable noise and vibration?	Yes
MUA	
Rotation is correct?	Yes

Gas piping is installed and valves are in on position?	Yes
Heater tested and is functional?	Yes
Internal motorized damper is fully opening?	Yes
Motor is operating below the FLA rating?	Yes
Unit free of noticeable noise and vibration?	Yes
HOODS	
Kitchen equipment installed in proper places?	No
Can kitchen equipment be turned on for final smoke test?	No
Griddle is completely centered underneath hood?	No
DOCUMENTATION	
Have trades/general contractor been notified about any issues and are they created on FaciliBuild?	Yes
PICTURES TAKEN OF:	
All Issues	Yes
Each Piece of equipment	Yes
Each Hood	Yes
Front of Store	Yes

Notes/Comments:

TECH - STEP 3 TEST
ADJUST AND BALANCE

Assigned Organization: National TAB

Status: Submitted

Asset:

TEST, ADJUST, AND BALANCE ALL EQUIPMENT:	
DURING TESTING MAKE NOTE OF THE FOLLOWING:	
Is space free of drafting?	Yes
Is space comfortable in all areas?	Yes
Is the space free of ventilation noise?	Yes
If deviations from design were necessary to resolve 1-3 what were they? Otherwise put "NA".	NA

Notes/Comments:

TECH - STEP 4 FINAL TESTS

Assigned Organization: National TAB

Status: Submitted

Asset:

FINAL TESTS	
HOOD CAPTURE TEST	
List equipment turned on for testing	NONE, EQUIPMENT HAS NOT BEEN STARTED UP
List smoke candle type used	SMOKE EMITTER
Smoke test capture - Perimeter of hood	100%
Smoke test capture - Top of cooking surface	100%
WITNESS	
Date test was completed	2/19/2019
TAB tech name / Firm	TRAVIS HALTER / NATIONAL TAB
Site super name / Firm	NOT PRESENT
Owner representative name / Firm (if Applicable)	NA
Building pressure at front & back doors (All Systems On)	-0.008" AVE WITH ALL SYSTEMS RUNNING / 0.010" AVE WITH THE DISH EF OFF [2]
ADDITIONAL	
Do actual net building airflow, design net building airflow, and pressure coincide? If not why? (All three should either be positive or negative)	Yes
Thermostats are programmed?	Yes
Thermostats Schdedules: Program all thermostats to following settings:	
All three thermostats have correct time/date? (if not set correctly)	Yes
Occupied Time: 8am-11:55pm	Yes
Occupied Fan ON	Yes
Occupied cooling 74	Yes
Occupied heating 68	Yes
Unoccupied Time 11:55pm-8am	Yes
Unoccupied Fan Auto	Yes
Unoccupied cooling 79	Yes
Unoccupied heating 63	Yes

Set a Partial Screen Lock for Thermostats (i.e., make sure temperature is adjustable but not schedule)	Yes
Password is set to 999 for Partial Screen Lock?	Yes
RTU Economizers	
Note: These instructions are for Lennox units. There are similar settings for other OEMs. Call office for assistance if needed.	
Enthalpy is set to "D" for all three units	Yes
"DCV Set" dials turned all the way to the left (counter clockwise)	Yes
"DCV Max" dials turned all the way to the left (counter clockwise)	Yes

Notes/Comments:

[1] For the existing units, RTU1 and 2 have prodegy board.
[2] This shows the outside bounds when in operation. The dish hood is currently wired to only run while the dishwasher is running.
[3] Password for thermostats is are 3074 3058 3064 3064 starting at the left most thermostat and going right. See pictures.

System/Unit: AHU/RTU

Asset: RTU1 AREA: KITCHEN

Unit Data		
	Design	**Actual**
MFG	LENNOX	LENNOX
Model Num	LGH048	LGH048H4ET4Y
Serial Num	-	5619A02934
Type	RTU	RTU
Configuration	VERTICAL DISCHARGE	VERTICAL
Num OA Filters 1	-	2
OA Filter Size 1	-	15.5X13.5
Num Final Filter 1	-	4
Final Filter Size 1	-	16X20X2

Motor Data		
	Design	**Actual**
Motor MFG	-	[1]
Frame	-	[1]
Horsepower	-	0.75
Motor Rpm	-	[1]
Phase	3	1
Rated Voltage	208	208
Rated Amperage	-	6.1

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
Belt Alignment	-	DD

Test Data		
	Design	**Actual**
SF CFM	1572	1576
SF RPM	-	DD
RA CFM	1300	1265
OA CFM	300	311
RL Voltage	-	216/216/216
RL Amperage	-	3.9/3.9/3.9
SF Rotation	-	CW, CORRECT
RA Damper Position	-	78%
Min OA Damper Position	-	22%
Min OA Damper Type	-	ECONOMIZER
Brake Horse Power	-	0.48

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.45”
Fan Suction SP	-	-0.64”
Fan Discharge SP	-	0.40”
Total ESP	0.75"	0.85”
Fan Total SP	-	1.04”

General		
	Design	**Actual**
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Travis Halter on 02/22/2019

Notes: [1] Motor sticker not accessible, motor data taken from unit sticker
[2] OCP not hooked up, Unit was jumped to set OA
[3] Speed set to 61%

Diffuser Supply (GRD)

RTU1 / KITCHEN

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	DISH WARE	S4	24X24	400	1	311	359	378	94.5
SGRD2	DRIVE-THRU	S4	24X24	400	1	374	389	408	102.0
SGRD3	ORDERING	S4	24X24	400	1	425	382	401	100.3
SGRD4	HOOD 1B ACPSP	ACPSP	82X6	372	1	366	371	389	104.6

Completed By: Travis Halter on 02/22/2019

Asset	Area Served	Notes

System/Unit: AHU/RTU

Asset: RTU2 AREA: KITCHEN

Unit Data		
	Design	**Actual**
MFG	LENNOX	LENNOX
Model Num	LGH092	LGH092H4BM3Y
Serial Num	-	5619A02030
Type	RTU	RTU
Configuration	VERTICAL DISCHARGE	VERTICAL
Num OA Filters 1	-	2
OA Filter Size 1	-	14.25X23
Num Final Filter 1	-	4
Final Filter Size 1	-	20X25X2

Motor Data		
	Design	**Actual**
Motor MFG	-	US MOTORS
Frame	-	56HZ
Horsepower	-	2
Motor Rpm	-	1755
Phase	3	3
Rated Voltage	208	200-230
Rated Amperage	-	6.0-5.7

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	3.125”
Motor Bore Size	-	0.875”
Motor Sheave SetPt	-	0.5 TURNS OUT
Fan Sheave Size	-	6”
Fan Sheave Bore	-	1”
Belt CL Distance	-	21.5”
Num of Belts	-	1
Belt Size	-	AX54
Belt Alignment	-	GOOD

Completed By: Travis Halter on 02/22/2019

Notes: [1] OCP not hooked up, OCP jumped to set OA

Test Data		
	Design	**Actual**
SF CFM	3000	2945
SF RPM	-	843
RA CFM	2200	2134
OA CFM	800	811
RL Voltage	-	215/215/215
RL Amperage	-	4.8/4.8/4.8
SF Rotation	-	CCW, CORRECT
RA Damper Position	-	59%
Min OA Damper Position	-	41%
Min OA Damper Type	-	ECONOMIZER
Brake Horse Power	-	1.6

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.54”
Fan Suction SP	-	-0.80”
Fan Discharge SP	-	0.60”
Total ESP	0.75"	1.14”
Fan Total SP	-	1.40”

General		
	Design	**Actual**
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Diffuser Supply (GRD)

RTU2 / KITCHEN

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	PREP	S3	24X24	300	1	339	264	300	100.0
SGRD2	PREP	S3	24X24	300	1	366	266	303	101.0
SGRD3	PREP	S4	24X24	500	1	350	395	450	90.0
SGRD4	OFFICE	S2	24X24	125	1	131	106	121	96.8
SGRD5	RESTROOM	S2	24X24	150	1	107	116	136	90.7
SGRD6	PREP	S4	24X24	500	1	410	421	480	96.0
SGRD7	PREP	S4	24X24	500	1	375	425	485	97.0
SGRD8	HOOD 2 ACPSP	ACPSP	82X6	306	1	314	289	329	107.5
SGRD9	HOOD 1A ACPSP	ACPSP	72X6	372	1	251	299	341	91.7

Completed By: Travis Halter on 02/22/2019

Asset	Area Served	Notes

Asset: XRTU3 AREA: DINING

Unit Data		
	Design	**Actual**
MFG	NA	YORK
Model Num	NA	D5NZ060N11025A
Serial Num	-	W1A3392373
Type	RTU	RTU
Configuration	VERTICAL DISCHARGE	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	19.25X13.25
Num Final Filter 1	-	2
Final Filter Size 1	-	19.5X11.5X1

Motor Data		
	Design	**Actual**
Motor MFG	-	[1]
Frame	-	[1]
Horsepower	-	1
Motor Rpm	-	[1]
Phase	-	1
Rated Voltage	-	208/230
Rated Amperage	-	7.6

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
Belt Alignment	-	DD

Test Data		
	Design	**Actual**
SF CFM	1750	1322
SF RPM	-	DD
RA CFM	1450	1138
OA CFM	300	184
RL Voltage	-	213
RL Amperage	-	5.4
SF Rotation	-	CW, CORRECT
RA Damper Position	-	NA
Min OA Damper Position	-	[4]
Min OA Damper Type	-	MOTORIZED DAMPE
Brake Horse Power	-	0.71

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.35”
Fan Suction SP	-	-0.70”
Fan Discharge SP	-	0.25”
Total ESP	-	0.60”
Fan Total SP	-	0.95”

General		
	Design	**Actual**
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Travis Halter on 02/22/2019

Notes: [1] Motor sticker is not accessible, motor data taken from unit sticker
[2] Internal Filters are metal mesh
[3] Unit has no way to increase speed, Diffusers are proportionally balanced
[4] OA damper motor does not work, removed from linkage and opened to max allowable point
[5] There is dirty buildup on fan wheel and filters, this means the coil is dirty and needs to be cleaned. Also the metal filters need to be replaced with typ fiber internal filters.

Diffuser Supply (GRD)

XRTU3 / DINING

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	DINING	S5	12"	200	1	199	141	141	70.5
SGRD2	DINING	S5	12"	200	1	188	159	159	79.5
SGRD3	DINING	S5	12"	200	1	185	144	144	72.0
SGRD4	DINING	S5	12"	250	1	155	189	189	75.6
SGRD5	DINING	S5	12"	250	1	159	195	195	78.0
SGRD6	DINING	S5	12"	250	1	151	191	191	76.4
SGRD7	DINING	S5	12"	250	1	157	199	199	79.6
SGRD8	RESTROOM	S2	8"	150	1	89	104	104	69.3

Completed By: Taylor Long on

Asset	Area Served	Notes

System/Unit: AHU/RTU

Asset: XRTU4 AREA: DINING

Unit Data		
	Design	**Actual**
MFG	NA	YORK
Model Num	NA	D5NZ060N11025A
Serial Num	-	W1A3392375
Type	RTU	RTU
Configuration	VERTICAL DISCHARGE	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	19.25X13.25
Num Final Filter 1	-	2
Final Filter Size 1	-	19.5X11.5X1

Motor Data		
	Design	**Actual**
Motor MFG	-	[1]
Frame	-	[1]
Horsepower	-	1
Motor Rpm	-	[1]
Phase	-	1
Rated Voltage	-	208/230
Rated Amperage	-	7.6

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
Belt Alignment	-	DD

Test Data		
	Design	**Actual**
SF CFM	1750	1412
SF RPM	-	DD
RA CFM	1450	1295
OA CFM	300	117
RL Voltage	-	213
RL Amperage	-	5.6
SF Rotation	-	CW
RA Damper Position	-	NA
Min OA Damper Position	-	[4]
Min OA Damper Type	-	MOTORIZED DAMPER
Brake Horse Power	-	0.76

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.43”
Fan Suction SP	-	-0.57”
Fan Discharge SP	-	0.23”
Total ESP	-	0.66”
Fan Total SP	-	0.80”

General		
	Design	**Actual**
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Travis Halter on 02/22/2019

Notes: [1] Motor sticker is not accessible, motor data taken from unit sticker
[2] Internal Filters are metal mesh
[3] Unit has no way to increase speed, Diffusers are proportionally balanced
[4] OA damper motor does not work, removed from linkage and opened to max allowable point
[5] There is dirty buildup on fan wheel and filters, this means the coil is dirty and needs to be cleaned. Also the metal filters need to be replaced with typ fiber internal filters.

Diffuser Supply (GRD)

XRTU4 / DINING

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	ENTRY	S1	6"	100	1	120	112	112	112.0
SGRD2	DINING	S5	12"	250	1	187	186	186	74.4
SGRD3	DINING	S5	12"	250	1	165	182	182	72.8
SGRD4	DINING	S5	12"	200	1	182	171	171	85.5
SGRD5	DINING	S5	12"	200	1	169	176	176	88.0
SGRD6	DINING	S5	12"	250	1	195	193	193	77.2
SGRD7	DINING	S5	12"	250	1	197	191	191	76.4
SGRD8	DINING	S5	12"	250	1	199	201	201	80.4

Completed By: Travis Halter on 02/22/2019

Asset	Area Served	Notes
SGRD1	ENTRY	[1] No damper installed.

System/Unit: FAN - Supply

Asset: MAU1 AREA: HOOD 1A, 1B, & 2

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	A1-D.250-G10	A1-D.250-G10
Serial Num	-	3441367
Type	MAU	MAU
Configuration	VERTICAL DISCHARGE	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	WEG
Frame	-	56HZ
Horsepower	2.00	2
Motor Rpm	-	1740
Phase	3	3
Voltage (rated)	208	230/460
Amperage (rated)	-	5.38/2.69
Service Factor	-	1.15

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	VL40
Motor Bore Size	-	0.625”
Fan Sheave Size	-	AX46
Fan Sheave Bore	-	0.75”
Belt CL Distance	-	14.25”
Num of Belts	-	1
Belt Size	-	AX39
Belt Alignment Verified	-	GOOD

Gas Heat		
	Design	**Actual**
Heater Operates (y/n)	-	YES
Flame Status (pass/fail)	-	PASS
Inlet Air Temp SetPt	55	55
Discharge Air Temp SetPt	60	60
Air Flow Switch SP Actual	-	0.65”

Test Data		
	Design	**Actual**
CFM	2743	2751
SF RPM	1263	1391
Motor RPM	-	1724
RL Voltage	-	211/211/211
RL Amperage	-	5.3/5.3/5.3
Total ESP	0.40"	NA
Fan Discharge SP	-	NA

General		
	Design	**Actual**
Fan Rotation Correct	-	YES

Completed By: Travis Halter on 02/22/2019

Notes:

System/Unit: FAN - Exhaust

Asset: EF1 AREA: MENS RESTROOM

Unit Data		
	Design	**Actual**
MFG	NA	PANASONIC
Model Num	NA	FV-1315RQ1
Serial Num	-	806
Type	-	CENTRIFUGAL
Configuration	-	CEILING

Motor Data		
	Design	**Actual**
Motor MFG	-	[1]
Frame	-	[1]
Horsepower	-	[1]
Motor Rpm	-	[1]
Phase	-	1
Voltage (rated)	-	120
Amperage (rated)	-	0.27
Service Factor	-	1.0

Test Data		
	Design	**Actual**
CFM	150	139
Fan RPM	-	DD
Fan Rotation	-	CCW, CORRECT
Motor RPM	-	DD
System SetPt	-	SWITCH SET TO 150 CFM
RL Voltage	-	[2]
RL Amperage	-	[2]
Total ESP	-	[3]
Fan Inlet SP	-	ATM
Fan Discharge SP	-	[3]

Completed By: Travis Halter on 02/18/2019

Notes: [1] Motor sticker not accessible, motor data taken from unit sticker
[2] No place to take volts and amps
[3] Ductwork located above hard ceiling, Unable to take SPs

System/Unit: FAN - Exhaust

Asset: EF2 AREA: WOMENS RESTROOM

Unit Data		
	Design	**Actual**
MFG	NA	PANASONIC
Model Num	NA	FV-1315RQ1
Serial Num	-	808
Type	-	CENTRIFUGAL
Configuration	-	CEILING

Motor Data		
	Design	**Actual**
Motor MFG	-	[1]
Frame	-	[1]
Horsepower	-	[1]
Motor Rpm	-	[1]
Phase	-	1
Voltage (rated)	-	120
Amperage (rated)	-	0.27
Service Factor	-	1.0

Test Data		
	Design	**Actual**
CFM	150	125
Fan RPM	-	DD
Fan Rotation	-	CCW, CORRECT
Motor RPM	-	DD
System SetPt	-	SWITCH SET TO 150 CFM
RL Voltage	-	[2]
RL Amperage	-	[2]
Total ESP	-	[3]
Fan Inlet SP	-	ATM
Fan Discharge SP	-	[3]

Completed By: Travis Halter on 02/18/2019

Notes: [1] Motor sticker not accessible, motor data taken from unit sticker
[2] No place to take volts and amps
[3] Ductwork located above hard ceiling, Unable to take SPs

System/Unit: FAN - Exhaust

Asset: KEF1 AREA: HOOD 1A & 1B FRYERS

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	NCA16HPFA	NCA16HPFA
Serial Num	-	3441367
Type	CENTRIFUGAL	CENTRIFUGAL
Configuration	UPBLAST	UPBLAST

Motor Data		
	Design	**Actual**
Motor MFG	-	WEG
Frame	-	56H
Horsepower	1.50	1.5
Motor Rpm	-	1760
Phase	3	3
Voltage (rated)	208	230/460
Amperage (rated)	-	4.2/2.1
Service Factor	-	1.15

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	VL40
Motor Bore Size	-	0.625”
Motor Sheave SetPt	-	2.5 TURNS OUT
Fan Sheave Size	-	4.5”
Fan Sheave Bore	-	1”
Belt CL Distance	-	6.25”
Num of Belts	-	1
Belt Size	-	AX23

Test Data		
	Design	**Actual**
CFM	2584	2713
Fan RPM	1329	1325
Fan Rotation	-	CCW
Motor RPM	-	1758
RL Voltage	-	210/210/210
RL Amperage	-	4.2/4.2/4.2
Suction ESP	-	-1.17”
Discharge ESP	-	ATM
Total ESP	1.40"	1.17”
Brake Horse Power	-	1.5

Completed By: Travis Halter on 02/18/2019

Notes: [1] Grease trough not installed

System/Unit: FAN - Exhaust

Asset: KEF2 AREA: HOOD 2 FRYERS

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	DU50HFA	DU50HFA
Serial Num	-	3441367
Type	CENTRIFUGAL	CENTRIFUGAL
Configuration	UPBLAST	UPBLAST

Motor Data		
	Design	**Actual**
Motor MFG	-	HSSA
Frame	-	48Y
Horsepower	0.50	0.5
Motor Rpm	-	1625
Phase	1	1
Voltage (rated)	115	115/230
Amperage (rated)	-	5.6/2.8
Service Factor	-	1.0

Test Data		
	Design	**Actual**
CFM	775	758
Fan RPM	1441	DD
Fan Rotation	-	CCW, CORRECT
Motor RPM	-	DD
System SetPt	-	NA
RL Voltage	-	80
RL Amperage	-	4.5
Total ESP	1.25"	0.55”
Fan Inlet SP	-	-0.55”
Fan Discharge SP	-	ATM

Completed By: Travis Halter on 02/18/2019

Notes: [1] Grease trough is not installed

System/Unit: FAN - Exhaust

Asset: KEF3 AREA: DISH HOOD

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	DU30HFA	DU30HFA
Serial Num	-	3441367
Type	CENTRIFUGAL	CENTRIFUGAL
Configuration	UPBLAST	UPBLAST

Motor Data		
	Design	**Actual**
Motor MFG	-	HSSA
Frame	-	48Y
Horsepower	0.25	0.25
Motor Rpm	-	1625
Phase	1	1
Voltage (rated)	115	115/230
Amperage (rated)	-	3.0/1.5
Service Factor	-	1.0

Test Data		
	Design	**Actual**
CFM	525	521
Fan RPM	1450	DD
Fan Rotation	-	CCW, CORRECT
Motor RPM	-	DD
System SetPt	-	NA
RL Voltage	-	74
RL Amperage	-	2.3
Total ESP	0.85"	0.49”
Fan Inlet SP	-	-0.49”
Fan Discharge SP	-	ATM

Completed By: Travis Halter on 02/18/2019

Notes:

System/Unit: Kitchen Hood Type I

Asset: HD1 AREA: GRIDDLE 1A

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	4824 ND-2-ACPSP-F	4824 ND-2
Job / Serial Num	-	3441367
Type	TYPE I CANOPY	TYPE I
Hood length	82	82”
Hood Width	48	48”
Supply Plenum Type	ACPSP	ACPSP
Supply Plenum Width	14	14”
Supply Plenum Length	82	82”

Test Data Exhaust		
	Design	**Actual**
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	16X16	16X16
Filter Qty 1	5	5
Filter AK factor size 1	1.62	1.62
Filter Total AK Area	8.1	8.1
Filter1 FPM	-	164
Filter2 FPM	-	170
Filter3 FPM	-	160
Filter4 FPM	-	173
Filter5 FPM	-	155
Filter Ave FPM(corr)	-	164
CFM	1292	1328

Cooking Equipment		
	Design	**Actual**
Item 1	-	GRIDDLE

Completed By: Travis Halter on 02/22/2019

Notes:

Test Data Supply		
	Design	**Actual**
AK factor	1	1
Total AK Area	7.97	7.97
Kv factor (Vel)	0.90	0.90
Reading1 FPM	-	112
Reading2 FPM	-	111
Reading3 FPM	-	127
Reading4 FPM	-	146
Reading5 FPM	-	153
Reading6 FPM	-	144
Ave FPM(corr)	-	132
CFM	1034	947

Performance Data		
	Design	**Actual**
Exh-Supply Net CFM	258	381
Smoke Generation Type	-	SMOKE EMITTER
Cooking Equip Heat On	-	NO
Hood Capture %	-	100%
End Panels Installed (Y/N)	-	NO
100% override functional	-	YES

General		
	Design	**Actual**
Third Party Witness	-	NONE
Third Party Company	-	NONE
Tech Witness	-	TRAVIS HALTER
Tech Company	-	NATIONAL TAB

National TAB

Project: FREDDY'S - EDWARDSVILLE, IL

System/Unit: Kitchen Hood Type I

Asset: HD2 AREA: GRIDDLE 1B

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	4824 ND-2-ACPSP-F	4824 ND-2
Job / Serial Num	-	3441367
Type	TYPE I CANOPY	TYPE I
Hood length	82	82”
Hood Width	48	48”
Supply Plenum Type	ACPSP	ACPSP
Supply Plenum Width	14	14”
Supply Plenum Length	82	82”

Test Data Exhaust		
	Design	**Actual**
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	16X16	16X16
Filter Qty 1	5	5
Filter AK factor size 1	1.62	1.62
Filter Total AK Area	8.1	8.1
Filter1 FPM	-	174
Filter2 FPM	-	174
Filter3 FPM	-	171
Filter4 FPM	-	176
Filter5 FPM	-	159
Filter Ave FPM(corr)	-	171
CFM	1292	1385

Cooking Equipment		
	Design	**Actual**
Item 1	-	GRIDDLE

Completed By: Travis Halter on 02/22/2019

Notes:

Test Data Supply		
	Design	**Actual**
AK factor	1	1
Total AK Area	7.97	7.97
Kv factor (Vel)	0.90	0.9
Reading1 FPM	-	147
Reading2 FPM	-	162
Reading3 FPM	-	184
Reading4 FPM	-	158
Reading5 FPM	-	138
Reading6 FPM	-	136
Ave FPM(corr)	-	154
CFM	1034	1105

Performance Data		
	Design	**Actual**
Exh-Supply Net CFM	258	280
Smoke Generation Type	-	SMOKE EMITTER
Cooking Equip Heat On	-	NO
Hood Capture %	-	100%
End Panels Installed (Y/N)	-	NO
100% override functional	-	YES

General		
	Design	**Actual**
Third Party Witness	-	NONE
Third Party Company	-	NONE
Tech Witness	-	TRAVIS HALTER
Tech Company	-	NATIONAL TAB

System/Unit: Kitchen Hood Type I

Asset: HD3 AREA: FRYER

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	5424 ND-2-ACPFP-F	5424 ND-2
Job / Serial Num	-	3441367
Type	TYPE I CANOPY	TYPE I
Hood length	60	60”
Hood Width	54	54”
Supply Plenum Type	ACPSP	ACPSP
Supply Plenum Width	12	12”
Supply Plenum Length	72	72”

Test Data Exhaust		
	Design	**Actual**
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	16X16	16X16
Filter Qty 1	3	3
Filter AK factor size 1	1.62	1.62
Filter Total AK Area	4.86	4.86
Filter1 FPM	-	157
Filter2 FPM	-	160
Filter3 FPM	-	152
Filter Ave FPM(corr)	-	156
CFM	775	758

Cooking Equipment		
	Design	**Actual**
Item 1	-	FRYER

Test Data Supply		
	Design	**Actual**
AK factor	1	1
Total AK Area	6	6
Kv factor (Vel)	0.87	0.87
Reading1 FPM	-	105
Reading2 FPM	-	136
Reading3 FPM	-	148
Reading4 FPM	-	137
Reading5 FPM	-	153
Reading6 FPM	-	129
Ave FPM(corr)	-	134
CFM	675	699

Performance Data		
	Design	**Actual**
Exh-Supply Net CFM	100	59
Smoke Generation Type	-	SMOKE EMITTER
Cooking Equip Heat On	-	NO
Hood Capture %	-	100%
End Panels Installed (Y/N)	-	NO

General		
	Design	**Actual**
Third Party Witness	-	NONE
Third Party Company	-	NONE
Tech Witness	-	TRAVIS HALTER
Tech Company	-	NATIONAL TAB

Completed By: Travis Halter on 02/22/2019

Notes:

System/Unit: Kitchen Hood Type II

Asset: HD(Type2)4 AREA: DISH HOOD

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	4224 ND-2	4224 ND-2
Serial Num	-	3441367
Type	TYPE II CANOPY	TYPE II
Hood length	42	42”
Hood Width	42	42”

Test Data		
	Design	**Actual**
Exhaust CFM	525	521

Completed By: Travis Halter on 02/22/2019

Notes: