Report By:

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

Report: **Test and Balance**
Date: **7/31/2020**

PROJECT

CHIPOTLE - LINDENHURST #31-3325 (LINDENHURST, NY)

96 E SUNRISE HWY
LINDENHURST, NY 11757

Client

Chipotle Mexican Grill
610 Newport Center Drive, Suite 1170
Newport Beach, CA 92660

National TAB

Project: CHIPOTLE - LINDENHURST #31-3325 (LINDENHURST, NY)

Table Of Contents

REMARKS

Assigned Organization: National TAB

Status: Not Submitted

Asset:

PRIORITY (HIGH/LOW/INFO ONLY)	
INFO ONLY	There are no remaining issues that require resolution.
INFO ONLY	Diffuser 6 on RTU-1 is operating at 171 CFM out of design of 225 CFM with the damper fully open. Unable to push air to this air device after multiple attempts without being a detriment to the overall airflow. No hood performance or comfort issues noted so no further action is necessary. The low airflow appears to be due to restricted flex duct due to limited ceiling space.

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.

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 +/-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 0.0037” 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 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

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	2400	2330	1900	1789	500	541	20.8%	23.2%						
RTU-2	DINING	3200	3276	2200	2187	1000	1089	31.3%	33.2%						
MUA-1	KITCHEN HOOD									1775	1638				
EF-1	KITCHEN HOOD											2925	3106		
EF-2	RESTROOM													150	155
TOTALS		5600	5606	4100	3976	1500	1630			1775	1638	2925	3106	150	155

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	3275	3268
TOTAL EXHAUST	3075	3261
NET AIRFLOW	200	7

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H20)
FRONT	0.005
SIDE	0.
REAR	0.006
AVERAGE	**0.0037**

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:

STOREFRONT

RTU1

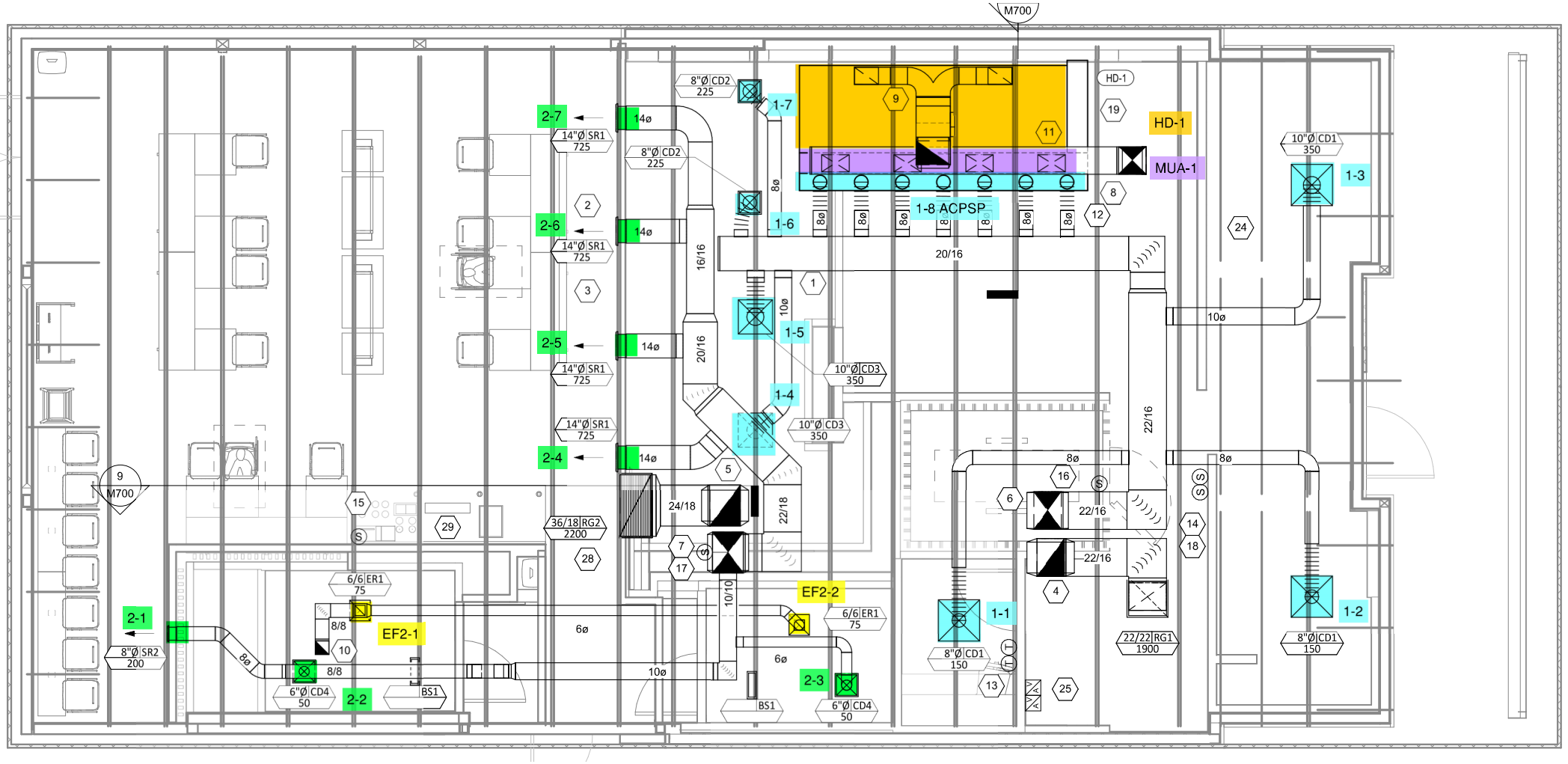
RTU2

EF1

MAU

EF2

HOOD


M700
HD-1
MUA-1
1-8 ACPSP
EF2-1
EF2-2
2-1
2-2
2-3
2-4
2-5
2-6
2-7
1-1
1-2
1-3
1-4
1-5
1-6
1-7
8"Ø CD2 225
14"Ø SR1 725
10"Ø CD1 350
10"Ø CD3 350
8"Ø CD1 150
8"Ø SR2 200
6"Ø CD4 50
6/6 ER1 75
36/18 RG2 2200
22/22 RG1 1900
20/16
16/16
24/18
22/18
22/16
10/10
8ø
10ø
14ø
6ø
BS1

TECH - STEP 1: INITIAL SITE WALKTHROUGH

Assigned Organization: National TAB

Status: Not Submitted

Asset:

INITIAL SITE WALKTHROUGH	
All diffusers and grilles are installed and match design?	YES
Deflector plates are removed from 1x1 diffusers on the serve line (double check that this is specified on the diffuser schedule first)	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?	YES

Notes/Comments:

TECH - STEP 2: UNIT DATA AND EVALUATION

Assigned Organization: National TAB

Status: Not Submitted

Asset:

UNIT DATA AND EVALUATION WHILE GATHERING UNIT DATA CHECK THE FOLLOWING:	
RTU's/AHU's	
IS ECONOMIZER BLANK PLATE INSTALLED BELOW THE OUTDOOR AIR FILTERS? (IF NO, REMOVE THE PIECE FROM UNDERNEATH THE COIL FILTER BANK AND INSTALL) Trane only (N/A = not applicable)	N/A
Economizers are assembled and functional?	YES
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.	N/A
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?	YES
Can kitchen equipment be turned on for final smoke test?	YES
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
Grease duct	YES

Notes/Comments:

TECH - STEP 3: TEST ADJUST AND BALANCE

Assigned Organization: National TAB

Status: Not 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: Not Submitted

Asset:

FINAL TESTS	
HOOD CAPTURE TEST	
List equipment turned on for testing	GRIDDLE
List smoke candle type used	90 SECOND EMITTER
Smoke test capture - Perimeter of hood	100%
Smoke test capture - Top of cooking surface	100%
WITNESS	
Date test was completed	7/30/2020
TAB tech name / Firm	JACK HITCHCOCK/NATIONAL TAB
Site super name / Firm	VIDEO RECORDED
Owner representative name / Firm (if Applicable)	VIDEO RECORDED
Video taken of smoke tests?	YES
Building pressure at front & back doors (All Systems On)	0.0036"
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? (If Lightstats put "N/A")	YES
If Lightstats, are the dimmers set to dim (Otherwise put N/A)	N/A

Notes/Comments:

System/Unit: AHU/RTU

Asset: RTU-1 AREA: KITCHEN

Unit Data

	Design	Actual
MFG	YORK	YORK
Model Num	ZJ078	ZJ078N12P2B5EAB2A2
Serial Num	-	N2D0696919
Type	RTU	RTU
Configuration	VERTICAL DISCHARGE	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	29X20.75
Num Final Filter 1	-	4
Final Filter Size 1	-	20X24X2
Num Final Filter 2	-	-
Final Filter Size 2	-	-

Motor Data

	Design	Actual
Motor MFG	-	BALDOR
Frame	-	56HZ
Horsepower	-	1.5
Motor Rpm	-	1740
Phase	3	3
Rated Voltage	208	208-230/460
Rated Amperage	-	4.3-4.2/2.1

Drive Data

	Design	Actual
Motor Sheave Size	-	1VL40
Motor Bore Size	-	7/8
Motor Sheave SetPt	-	0 TURNS OUT
Fan Sheave Size	-	AK74
Fan Sheave Bore	-	1
Belt CL Distance	-	19
Num of Belts	-	1
Belt Size	-	A53
Belt Alignment	-	GOOD

Test Data

	Design	Actual
SF CFM	2400	2330
SF RPM	-	869
RA CFM	1900	1789
OA CFM	500	541
RL Voltage	-	203/207/205
RL Amperage	-	2.8/3.3/2.5
SF Rotation	-	CW
RA Damper Position	-	84%
Min OA Damper Position	-	16%
Min OA Damper Type	-	ECONOMIZER

Performance Data

	Design	Actual
MA Plenum SP	-	-0.41"
Fan Suction SP	-	-0.61"
Fan Discharge SP	-	0.67"
Total ESP	0.80"	1.08"
Fan Total SP	-	1.28"

General

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

Completed By: Jack Hitchcock on 07/31/2020

Notes: MAX SPEED SET TO 60HZ.

Diffuser Supply (GRD)

RTU-1 / KITCHEN

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	OFFICE	CD1	8"	150	1	164	173	164	109.3
SGRD2	KITCHEN	CD1	8"	150	1	167	181	163	108.7
SGRD3	KITCHEN	CD1	10"	350	1	179	197	337	96.3
SGRD4	SERVICE LINE	CD3	10"	350	1	202	226	322	92.0
SGRD5	SERVICE LINE	CD3	10"	350	1	268	285	325	92.9
SGRD6	SERVICE LINE	CD2	8"	225	1	121	132	171	76.0
SGRD7	SERVICE LINE	CD2	8"	225	1	171	167	204	90.7
SGRD8	ACPSP	ACPSP	168"X6"	600	5.46	978	595	644	107.3

Completed By: Jack Hitchcock on 07/30/2020

Asset	Area Served	Notes
SGRD6	SERVICE LINE	Diffuser 6 on RTU-1 is operating at 171 CFM out of design of 225 CFM with the damper fully open. Unable to push air to this air device after multiple attempts without being a detriment to the overall airflow. No hood performance or comfort issues noted so no further action is necessary. The low airflow appears to be due to restricted flex duct due to limited ceiling space.

System/Unit: AHU/RTU

Asset: RTU-2 AREA: DINING

Unit Data		
	Design	**Actual**
MFG	YORK	YORK
Model Num	ZJ090	ZJ090N18R2B5 EAB2A2
Serial Num	-	N2D0696921
Type	RTU	RTU
Configuration	VERTICAL DISCHARGE	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	29X20.75
Num Final Filter 1	-	4
Final Filter Size 1	-	20X24X2
Num Final Filter 2	-	-
Final Filter Size 2	-	-

Motor Data		
	Design	**Actual**
Motor MFG	-	BALDOR
Frame	-	56HZ
Horsepower	-	3
Motor Rpm	-	1750
Phase	3	3
Rated Voltage	208	208-230/460
Rated Amperage	-	8.3-8.2/4.1

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	1VM50
Motor Bore Size	-	7/8
Motor Sheave SetPt	-	3 TURNS OUT
Fan Sheave Size	-	AK69
Fan Sheave Bore	-	1
Belt CL Distance	-	19
Num of Belts	-	1
Belt Size	-	A54
Belt Alignment	-	GOOD

Test Data		
	Design	**Actual**
SF CFM	3200	3276
SF RPM	-	988
RA CFM	2200	2187
OA CFM	1000	1089
RL Voltage	-	203/204/206
RL Amperage	-	3.8/4.2/5.2
SF Rotation	-	CW
RA Damper Position	-	84%
Min OA Damper Position	-	16%
Min OA Damper Type	-	ECONOMIZER

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.51"
Fan Suction SP	-	-0.92"
Fan Discharge SP	-	0.75"
Total ESP	0.80"	1.26"
Fan Total SP	-	1.67"

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

Completed By: Jack Hitchcock on 07/31/2020

Notes: MAX SPEED SET TO 56HZ

Diffuser Supply (GRD)

RTU-2 / DINING

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	DINING	SR2	8"	200	1	86	102	182	91.0
SGRD2	CORRIDOR	CD4	8"	50	1	59	103	53	106.0
SGRD3	CORRIDOR	CD4	8"	50	1	55	91	55	110.0
SGRD4	DINING	SR1	14"	725	1	307	583	741	102.2
SGRD5	DINING	SR1	14"	725	1	247	519	772	106.5
SGRD6	DINING	SR1	14"	725	1	308	648	705	97.2
SGRD7	DINING	SR1	14"	725	1	284	600	768	105.9

Completed By: Jack Hitchcock on 07/30/2020

Asset	Area Served	Notes

System/Unit: FAN - Supply

Asset: MUA-1 AREA: HD-1 - COOKLINE

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	A1-D.250-G10	A1-D.250-G10
Serial Num	-	4027098
Type	MUA	MUA
Configuration	VERTICAL DISCHARGE	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	WEG
Frame	-	56HZ
Horsepower	2	2.0
Motor Rpm	-	1740
Phase	3	3
Voltage (rated)	208	230/460
Amperage (rated)	-	5.38/2.69
Service Factor	-	1.15

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	-	0.38"

Test Data		
	Design	**Actual**
CFM	1775	1638
SF RPM	-	1120
Motor RPM	-	1766
RL Voltage	-	205/205/205
RL Amperage	-	3.3/3.4/3.4
Total ESP	0.80"	NA
Fan Discharge SP	-	NA

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

Completed By: Jack Hitchcock on 07/31/2020

Notes:

System/Unit: FAN - Exhaust

Asset: EF-1 AREA: HD-1 - COOKLINE

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	NCA24HPFA	NCA24HPFA
Serial Num	-	4027098
Type	CENTRIFUGAL	CENTRIFUGAL
Configuration	UPBLAST	UPBLAST

Motor Data		
	Design	**Actual**
Motor MFG	-	WEG
Frame	-	56HZ
Horsepower	2	2.0
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	-	2VP42
Motor Bore Size	-	7/8
Motor Sheave SetPt	-	1.5 TURNS OUT
Fan Sheave Size	-	2BK80H
Fan Sheave Bore	-	1
Belt CL Distance	-	8
Num of Belts	-	2
Belt Size	-	BX-31

Test Data		
	Design	**Actual**
CFM	2925	3106
Fan RPM	-	918
Fan Rotation	-	CCW
Motor RPM	-	1752
RL Voltage	-	205/205/205
RL Amperage	-	3.6/3.8/3.6
Suction ESP	-	-1.12"
Discharge ESP	-	ATM
Total ESP	1.20"	1.12"

Completed By: Jack Hitchcock on 07/31/2020

Notes:

System/Unit: FAN - Exhaust

Asset: EF-2 AREA: RR

Unit Data		
	Design	**Actual**
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	DR12HFA	DR12HFA
Serial Num	-	4027098
Type	CENTRIFUGAL	CENTRIFUGAL
Configuration	DOWNBLAST	DOWNBLAST

Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Frame	-	42
Horsepower	0.18	1/4
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	120	115
Amperage (rated)	-	2.9
Service Factor	-	NL

Test Data		
	Design	**Actual**
CFM	150	155
Fan RPM	-	860
Fan Rotation	-	CCW
Motor RPM	-	860
System SetPt	-	48%
RL Voltage	-	125
RL Amperage	-	0.23
Total ESP	0.60"	0.41"
Fan Inlet SP	-	-0.41"
Fan Discharge SP	-	ATM

Completed By: Jack Hitchcock on 07/31/2020

Notes:

Diffuser Ret/Exh (GRD)

EF-2 / RR

Asset	Area Served	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
EGRD1	RR	ER1	6"X6"	75	1	123	-	81	108.0
EGRD2	RR	ER1	6"X6"	75	1	116	-	74	98.7

Completed By: Jack Hitchcock on 07/31/2020

Asset	Area Served	Notes

System/Unit: Kitchen Hood Type I

Asset: HD-1 AREA: COOK LINE

Unit Data

	Design	Actual
MFG	CAPTIVE-AIRE	CAPTIVE-AIRE
Model Num	5424 ND-2-ACPSP-F	5424 ND-2-ACPSP-F
Job / Serial Num	-	4027098
Type	TYPE I CANOPY	TYPE I
Hood length	156	156
Hood Width	54	54
Supply Plenum Type	ACPSP	ACPSP
Supply Plenum Width	12	12
Supply Plenum Length	168	168

Test Data Exhaust

	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	16X16	16X16
Filter Qty 1	9	9
Filter AK factor size 1	1.62	1.62
Filter Total AK Area	14.58	14.58
Filter1 FPM	-	215
Filter2 FPM	-	236
Filter3 FPM	-	223
Filter4 FPM	-	202
Filter5 FPM	-	196
Filter6 FPM	-	183
Filter7 FPM	-	225
Filter8 FPM	-	229
Filter9 FPM	-	210
Filter Ave FPM(corr)	-	213
CFM	2925	3106

Cooking Equipment

	Design	Actual
Item 1	-	GRIDDLE
Item 2	-	GRILL
Item 3	-	RICE COOKER
Item 4	-	FRYER

Test Data Supply

	Design	Actual
AK factor	1	1
Total AK Area	14	14
Kv factor (Vel)	0.87	0.87
Reading1 FPM	-	178
Reading2 FPM	-	128
Reading3 FPM	-	113
Reading4 FPM	-	129
Reading5 FPM	-	148
Reading6 FPM	-	135
Reading7 FPM	-	106
Reading8 FPM	-	126
Reading9 FPM	-	161
Reading10 FPM	-	159
Reading11 FPM	-	133
Reading12 FPM	-	107
Reading13 FPM	-	117
Reading14 FPM	-	121
Ave FPM(corr)	-	117
CFM	1775	1638

Performance Data

	Design	Actual
Exh-Supply Net CFM	1150	1468
Smoke Generation Type	-	90 SECOND EMITTER
Cooking Equip Heat On	-	YES
Hood Capture %	-	100%
End Panels Installed (Y/N)	-	YES
Space Offset Temp Riser 1	-	15
Space Offset Temp Riser 2	-	15
Riser Temp F (idle) Riser 1	-	72.8
Riser Temp F (idle) Riser 2	-	73.3
Ambient Room Temp	-	72.0
100% override functional	-	YES

General

	Design	Actual
Third Party Witness	-	VIDEO RECORDED
Third Party Company	-	VIDEO RECORDED

Project: CHIPOTLE - LINDENHURST #31-3325 (LINDENHURST, NY)

System/Unit: Kitchen Hood Type I

General		
	Design	**Actual**
Tech Witness	-	JACK HITCHCOCK
Tech Company	-	NATIONAL TAB

Completed By: Jack Hitchcock on 07/31/2020

Notes:

Rectangular Duct Traverse Report

System: RTU-2 (YORK-ZJ090N18R2B5EAB2A2-DINING)

Service:

Altitude: Density: Factor:

Duct		Design	Actual
Width: 22	Readings: 4	SCFM:	SCFM:
Height: 18	Readings: 3	FPM:	FPM: 1116
Area: 2.75		CFM:	CFM: 3069
S.P.:	Temp:		

Notes:

Duct Traverse Data Points

1439	1411	1357	1038
1214	1121	959	937
1225	943	851	894