

Report By:

National TAB
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Report: Wingstop (Oakland, CA) TAB REPORT

Function: Test, Adjust, & Balance

Date: 02/23/2024

PROJECT

Wingstop (Oakland, CA)

10700 MACARTHUR BLVD #2A

OAKLAND, CA 94605

Client

KMS Resource Group Inc.

8502 E CHAPMAN AVE

SUITE 274

ORANGE, CA 92869

National TAB

Project: Wingstop (Oakland, CA)

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CERTIFICATION

PROJECT: Wingstop (Oakland, CA)

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-Southeast

REGISTRATION NO: 3755

CERTIFIED BY: J. Scott Springer 23312

DATE: 2/26/2024

The hydronic 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-Southeast

REGISTRATION NO: 3086

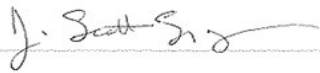
CERTIFIED BY: J. Scott Springer 23312

DATE: _____

Submitted and Certified by:

NEBB TAB FIRM: National TAB-Southeast

TAB PROFESSIONAL: J. Scott Springer

SIGNATURE: 

REGISTRATION NO: 3755 (NTAB) / 23312

CERTIFICATION EXP: 12/31/2024





National TAB

Testing, Adjusting, and Balancing Equipment



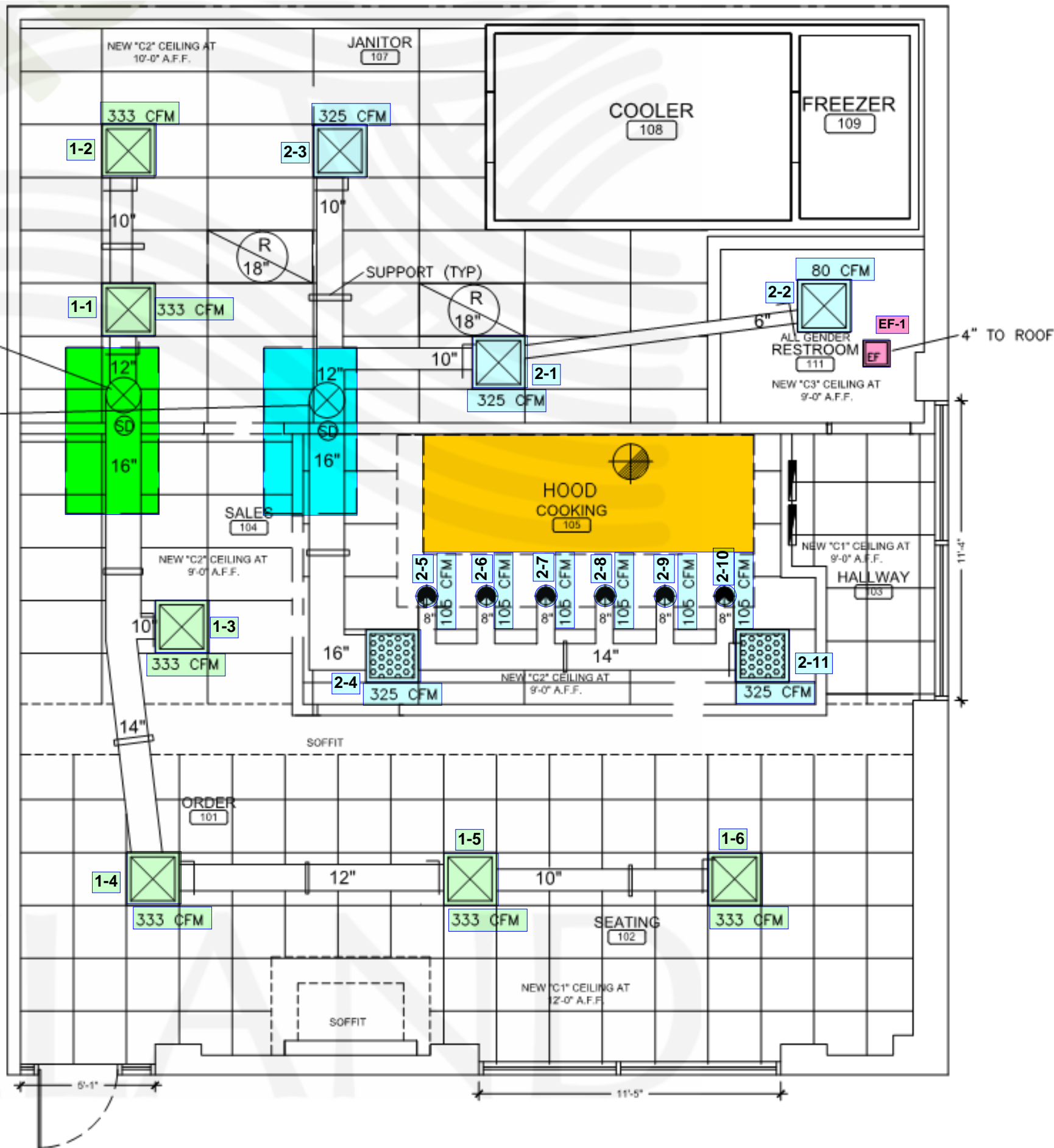
Function		Range	Minimum Accuracy	Instrument Information	Calibration Date	Date Due
AIR	AIR PRESSURE	0 in wg to 10 in wg	2% +/- 0.001 in wg	Shortridge ADM-860C S/N M19547	10/17/2023	10/16/2024
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	Shortridge ADM-860C S/N M19548	10/17/2023	10/16/2024
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 3 % +/- 7 cfm	Shortridge Flow Hood	10/17/2023	10/16/2024
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/20/2023	10/19/2024
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 5028	10/20/2023	10/19/2024
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/20/2023	10/19/2024
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 1075	10/20/2023	10/19/2024
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/20/2023	10/19/2024
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 4011	10/20/2023	10/19/2024
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper ATKINS - SRH77A S/N 090315046	10/20/2023	10/19/2024
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/16/2023	10/15/2024
	AMPERAGE MEASUREMENT	0 Amperers to 100 Amperes	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/16/2023	10/15/2024
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	Dwyer TAC-L - S/N S1100123	10/16/2023	10/15/2024
HYDRONIC	PRESSURE MEASUREMENT	-30 in Hg to 200 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/21/2023	6/20/2024
	DIFFERENTIAL PRESSURE MEASUREMENT	0 psi - 80 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/21/2023	6/20/2024
DALT	DUCT LEAKAGE	-10" - +10" wc	±1% of reading +/- 0.004" wc	Kanomax DALT 6900 S/N: 080439	5/2023	5/2024

Abbreviation List

A = Area (ft ²)	S.F. = Service Factor
AHU = Air Handling Unit	SF = Supply Fan
A _k = Effective Area	SP = Static Pressure
BHP = Brake Horsepower (IP) HP	SR = Supply Register
Btu = British Thermal Unit	T = Temperature
Btu/h = Btuh = BTUH = BTU/Hour	T _{ma} = Mixed Air Temperature
CL = Center Distance (used in belt formula)	T _{oa} = Outside Air Temperature
CD = Ceiling Diffuser	T _{ra} = Return Air Temperature
CF = Correction Factor	H = Head (in wc, ft wc, psi)
CFM = Volumetric Flow: Cubic Feet Per Minute	h = Enthalpy
CO ₂ = Carbon Dioxide	HP = Horsepower
CO = Carbon Monoxide	hr = Hour
C _v = Flow Constant	K _v = Flow constant (SI)
d = Diameter (in.) IP	kW = Kilowatt = 1000 Watts
Δ = Difference or Change (Final - Initial)	LAT = Leaving Air Temperature
DB = Dry Bulb	lb = Pounds
EA = Exhaust Air	LWT = Leaving Water Temperature
EAT = Entering Air Temperature	ma = Mixed Air
EF = Exhaust Fan	MIN = Minimum
Eff = Efficiency	MAX = Maximum
EG = Exhaust Grille	N/A = Not Applicable
ESP = External Static Pressure	NA = No Access
EWT = Entering Water Temperature	NL = Not Listed
°F = Degrees Fahrenheit, °F	NPSHA = Net Positive Suction Head Available
FPB = Fan Powered Box	NS = Not Specified
FLA = Full Load Amps	OA = Outside Air
fpm = Feet per Minute (fpm)	OAT = Outside Air Temperature
ft = Foot	PD = Sheave Pitch Diameter
gal = Gallons	P.D. = Pressure Drop
GPM = Gallons Per Minute (GPM)	PF = Power Factor
h = Enthalpy (BTU/lb dry air)	SG = Supply Grille
P = Pressure	SR = Supply Register
ppm = parts per million	TP = Total Pressure
psi = Pounds Per Square Inch	T _{ra} = Return Air Temperature
psid = PSI Differential	TS = Tip Speed (fpm) IP, (m/s) SI
r = Radius (in)	TSP = Total Static Pressure
% _{ra} = % of Return Air	V = Velocity
RA = Return Air	VAV = Variable Air Volume
RAT = Return Air Temperature	VD = Volume Damper
RF = Return Fan	VFD = Variable Frequency Drive
RG = Return Grille	W = Watt
RH = Relative Humidity	WB = Wet Bulb
RPM = Revolutions Per Minute	wg = wc = water gauge = water column
RTU = Roof Top Unit	WHP = Water Horsepower (IP)
SA = Supply Air	ω = Humidity Ratio

AC-1
5 TON HVAC ON ROOF
16" DROP - 2000 CFM

AC-2
5 TON HVAC ON ROOF
16" DROP - 2000 CFM



HVAC FLOOR PLAN

SCALE: 1/4" = 1'-0"

National TAB

Project: Wingstop (Oakland, CA)

System/Unit: AHU/RTU



Asset: RTU-1

AREA:102

Unit Data		
	Design	Actual
MFG	NA	JOHNSON CONTROLS
Serial Num	-	N2L3959691
Model Num	NA	ZYG06E2C1AA3B221A4
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	28X16
Num PreFilter 1	-	4
PreFilter Size 1	-	16X16X2

Test Data		
	Design	Actual
SF CFM	2000	1997
RA CFM	1685	1678
OA CFM	315	319
RL Voltage	208	209/210/211
RL Amperage	-	6.6/6.3/6.4
OA Damper Position	-	17%
Brake Horse Power	-	2.15

Motor Data		
	Design	Actual
Motor MFG	-	BALDOR RELIANCE
Frame	-	56HZ
Horsepower	-	2.9
Motor Rpm	-	1745
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	8.9
Service Factor	-	1.15

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.91"
Fan Suction SP	-	1.15"
Fan Discharge SP	-	0.28"
Total ESP	-	1.19"
Fan Total SP	-	1.43"

Completed By: Zack Eismin on 02/22/2024

National TAB

Project: Wingstop (Oakland, CA)

AHU/RTU



Diffuser Supply (GRD)

RTU-1/102

Asset							
Asset Name	Location	Type	Size	DESIGN CFM	CFM(1)	FINAL CFM	% to design
1-1	104			333	436	338	101.5
1-2	101			333	416	315	94.6
1-3	104			333	282	325	97.6
1-4	104			333	204	341	102.4
1-5	102			333	219	331	99.4
1-6	102			333	221	347	104.2
Total				1998	1778	1997	99.95%

National TAB

Project: Wingstop (Oakland, CA)

System/Unit: AHU/RTU



Asset: RTU-2

AREA:BOH

Unit Data		
	Design	Actual
MFG	NA	JOHNSON CONTROLS
Serial Num	-	N2C3509520
Model Num	NA	ZYG06E2C1AA3B221A4
Configuration	CERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	28X16
Num PreFilter 1	-	4
PreFilter Size 1	-	16X16X2

Test Data		
	Design	Actual
SF CFM	2000	2142
RA CFM	1685	1444
OA CFM	315	321
RL Voltage	208	211/210/209
RL Amperage	-	6.16/6.3/6.6
OA Damper Position	-	17%
Brake Horse Power	-	2.05

Motor Data		
	Design	Actual
Motor MFG	-	BALDOR RELIANCE
Frame	-	56HZ
Horsepower	-	2.9
Motor Rpm	-	1745
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	8.9
Service Factor	-	1.15

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.89"
Fan Suction SP	-	-1.1"
Fan Discharge SP	-	0.25"
Total ESP	-	1.14"
Fan Total SP	-	1.35"

Completed By: Zack Eismin on 02/22/2024

Notes:
CONNECTED LOAD IS 2130 CFM

Written By: Michael Gabbert on 02/19/2024

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Project: Wingstop (Oakland, CA)

AHU/RTU



Diffuser Supply (GRD)

RTU-2/BOH

Asset							
Asset Name	Location	Type	Size	DESIGN CFM	CFM(1)	FINAL CFM	% to design
2-1	BOH	CD		325	386	327	100.6
2-2	111	CD		80	105	83	103.8
2-3	BOH	CD		325	282	315	96.9
2-4	105	CD	8	325	50	319	98.2
2-5	105	PSP	8	125	102	127	101.6
2-6	105	PSP	8	125	101	127	101.6
2-7	105	PSP	8	125	101	127	101.6
2-8	105	PSP	8	125	102	127	101.6
2-9	105	PSP	8	125	101	127	101.6
2-10	105	PSP	8	125	102	127	101.6
2-11	105	CD		325	331	336	103.4
Total				2130	1763	2142	100.56%

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Project: Wingstop (Oakland, CA)

System/Unit: FAN - Supply



Asset: MUA-1

AREA:ROOF

Unit Data		
	Design	Actual
MFG	NA	CAPTIVEAIRE
Model Num	NA	A1-A5D
Serial Num	-	5821150
Type	MUA	MUA
Configuration	VERTICAL	VERTICAL
Num Filters Size 1	-	2
Filter Size 1	-	18X14

Test Data		
	Design	Actual
CFM	2250	2264
SF RPM	2047	2128
RL Voltage	-	209/210/209
RL Amperage	-	4.7/4.8/4.8
Suction ESP	-	NA
Discharge ESP	-	NA
Total ESP	0.500	NA
Brake Horse Power	-	1.75

Motor Data		
	Design	Actual
Motor MFG	-	TECO
Frame	-	145T
Horsepower	2.00	2
Motor Rpm	2047	1740
Phase	3	3
Voltage (rated)	208	230
Amperage (rated)	-	5.48
Service Factor	-	1.15

Completed By: Zack Eismin on 02/22/2024

National TAB

Project: Wingstop (Oakland, CA)

FAN - Supply



Diffuser Supply (GRD)

MUA-1/ROOF

Asset							
Asset Name	Location	Type	Size	DESIGN CFM	CFM(1)	FINAL CFM	% to design
SGRD1	HOOD-1	PSP	12X28	750			-
SGRD2	HOOD-1	PSP	12X28	750			-
SGRD3	HOOD-1	PSP	12X28	750			-
Total				2250	0	0	0%

National TAB

Project: Wingstop (Oakland, CA)

System/Unit: FAN - Exhaust



Asset: EF-1

AREA:111

Unit Data		
	Design	Actual
MFG	NA	ZHONGSHAN
Model Num	NA	BPT13-14D
Serial Num	-	795074
Type	CEILING	CEILING

Test Data		
	Design	Actual
CFM	80	78
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	-	0.11"

Motor Data		
	Design	Actual
Motor MFG	-	NL
Frame	-	NL
Horsepower	-	NL
Motor Rpm	-	NL
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	0.18
Service Factor	-	NL

Completed By: Zack Eismin on 02/22/2024

National TAB

Project: Wingstop (Oakland, CA)

System/Unit: FAN - Exhaust



Asset: KEF-1

AREA:ROOF

Unit Data		
	Design	Actual
MFG	NA	CAPTIVEAIRE
Model Num	NA	DU180HFA
Serial Num	-	5821150
Type	CRE UPBLAST	UPBLAST

Test Data		
	Design	Actual
CFM	2800	2808
RL Voltage	-	209/210/210
RL Amperage	-	7.1/7.2/7.1
Total ESP	1.50	1.47"

Motor Data		
	Design	Actual
Motor MFG	-	TECO
Frame	-	184T
Horsepower	2.000	2
Motor Rpm	1272	1165
Phase	3	3
Voltage (rated)	208	230
Amperage (rated)	-	7.51
Service Factor	-	1.15

Completed By: Zack Eismin on 02/22/2024

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Project: Wingstop (Oakland, CA)



System/Unit: Kitchen Hood Type I

Asset: HOOD-1

AREA:105

Unit Data		
	Design	Actual
MFG	NA	CAPTIVEAIRE
Model Num	NA	5430 ND-2-ACPSP-F
Job / Serial Num	-	5281150
Type	TPE I CANOPY	TYPE I CANOPY
Hood length	150	150"
Hood Width	54	54"
Supply Plenum Type	-	PSP
Supply Plenum Width	14	14"
Supply Plenum Length	162	162"

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	20X16	20X16
Filter Qty 1	9	9
Filter AK factor size 1	2.08	2.08
Filter Total AK Area	18.72	18.72
Filter1 FPM	-	134
Filter2 FPM	-	146
Filter3 FPM	-	137
Filter4 FPM	-	147
Filter5 FPM	-	165
Filter6 FPM	-	164
Filter7 FPM	-	156
Filter8 FPM	-	163
Filter9 FPM	-	139
Filter Ave FPM(corr)	-	150
CFM	2800	2808

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

Test Data Supply		
	Design	Actual
Total AK Area	15.75	15.75
Kv factor (Vel)	0.91	0.91
Num of Readings	-	12
Reading1 FPM	-	177
Reading2 FPM	-	167
Reading3 FPM	-	108
Reading4 FPM	-	177
Reading5 FPM	-	163
Reading6 FPM	-	139
Reading7 FPM	-	148
Reading8 FPM	-	170
Reading9 FPM	-	182
Reading10 FPM	-	135
Reading11 FPM	-	160
Reading12 FPM	-	170
Ave FPM(corr)	-	158
CFM	2250	2264

Completed By: Zack Eismin on 02/22/2024