Report By:

National TAB
1329 E. KEMPER ROAD
SUITE 4210
CINCINNATI, OH 45246

NATIONAL TAB

Comfort. Under control.

Report: Crave BBQ (Charleston, SC)
Function: Test, Adjust, & Balance
Date: 04/12/2023

PROJECT

Crave-Westedge

99 Westedge

Charleston, SC

Client

Air Pro Heating & Cooling
4135 Dorchester Rd

North Charleston, SC 29405

National TAB

Project: Crave-Westedge

Table Of Contents

CERTIFICATION

PROJECT: Crave BBQ (Charleston, SC)

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.

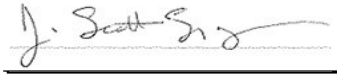
The air distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM:	National TAB-Southeast
REGISTRATION NO:	3755
CERTIFIED BY:	J. Scott Springer 23312
DATE:	4/12/2023

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:	

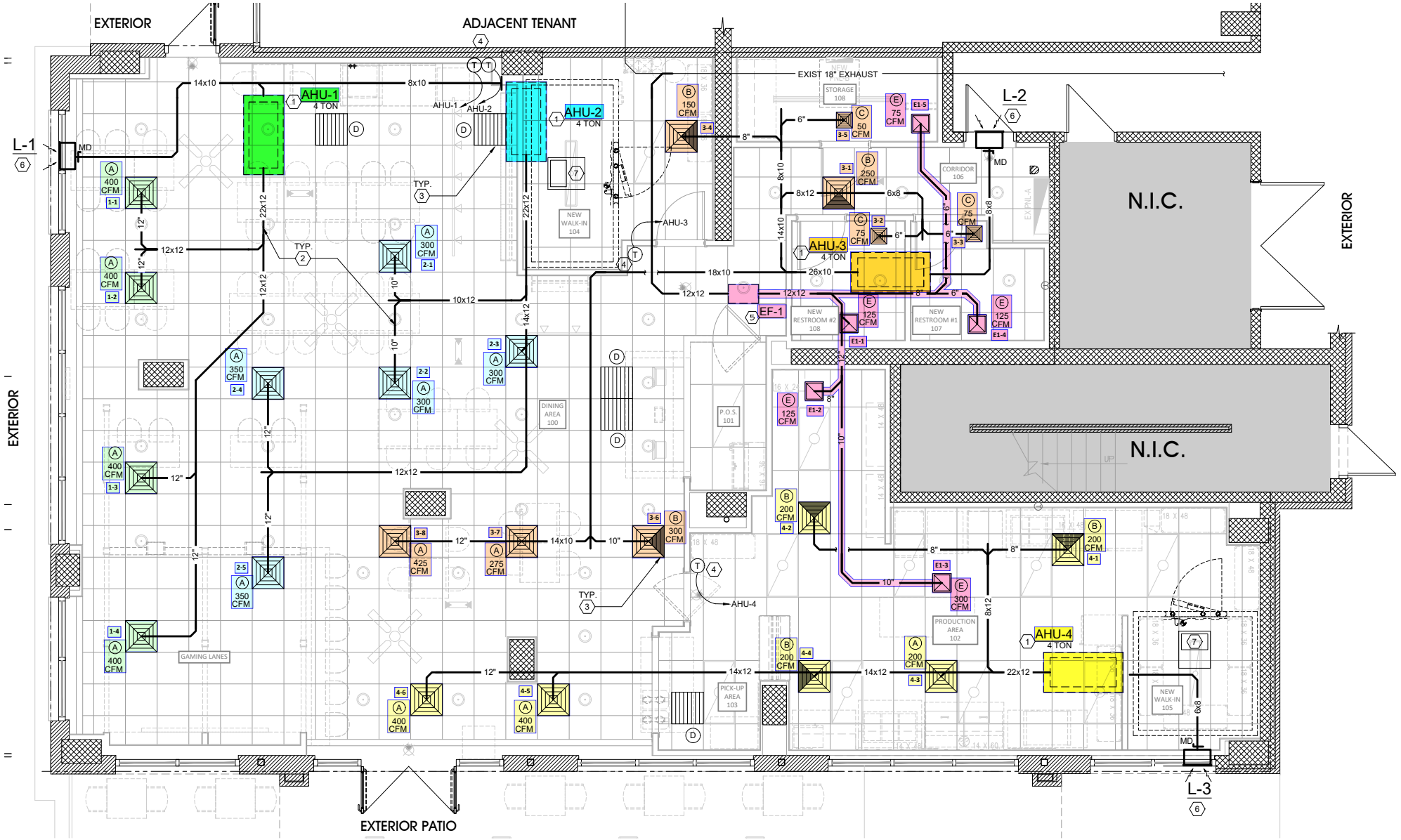
Submitted and Certified by:

NEBB TAB FIRM:	National TAB-Southeast
TAB PROFESSIONAL:	J. Scott Springer
SIGNATURE:	
REGISTRATION NO:	3755 (NTAB) / 23312
CERTIFICATION EXP:	12/31/2023

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 880C - S/N M05066	9/28/2022	9/28/2023
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	Shortridge ADM 880C - S/N M05066	9/28/2022	9/28/2023
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 3 % +/- 7 cfm	Shortridge ADM 880C - S/N M05066	9/28/2022	9/28/2023
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/12/2022	10/12/2023
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 5028	10/12/2022	10/12/2023
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/12/2022	10/12/2023
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 1075	10/12/2022	10/12/2023
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/12/2022	10/12/2023
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 4011	10/12/2022	10/12/2023
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper ATKINS - SRH77A S/N 090315046	10/12/2022	10/12/2023
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/12/2022	10/12/2023
	AMPERAGE MEASUREMENT	0 Amperers to 100 Amperes	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/12/2022	10/12/2023
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	Dwyer TAC-L - S/N S1100123	10/12/2022	10/12/2023
HYDRONIC	PRESSURE MEASUREMENT	-30 in Hg to 200 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/29/2022	6/29/2023
	DIFFERENTIAL PRESSURE MEASUREMENT	0 psi - 80 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/29/2022	6/29/2023

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
CO2 = 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



Mechanical HVAC Plan

National TAB

Project: Crave - Westedge

Address: 99 WESTEDGE STE 1100 CHARLESTON, SC

Asset: AHU-1 (EXISTING) **Area: DINING AREA**

Unit Data	
MFG	CARRIER
Model Num	FB4CNP048
Serial Num	2017A83728

Motor Data	
Motor MFG	N/L
Horsepower	0.75
Motor Rpm	N/L
Phase	1
Voltage (rated)	208
Amperage (rated)	3

Test Data		
	Design	**Actual**
SA CFM	1600	1451
Fan Speed		HIGH
OA CFM	375	75
RA CFM	1225	1376
RL Voltage	208	211
RL Amperage		3.2
Suction ESP		-0.398
Discharge ESP		0.127
Total ESP	0.5	0.525
Brake HP		N/A

Asset	Area Served	Type	Size	DESIGN CFM	Prelim CFM	FINAL CFM	% to design
1-1	100	A	12X12	400	363	360	0.90
1-2	100	A	12X12	400	347	364	0.91
1-3	100	A	12X12	400	386	366	0.92
1-4	GAMING	A	12X12	400	364	361	0.90
				1600		**1451**	**0.91**

Notes:

OUTSIDE AIR DUCT IS NOT DUCTED TO THE UNIT, UNIT HAS OPEN RETURN AND IS NOT ABLE TO PULL THE REQUIRED CFM THROUGH DUCTWORK. RECOMMEND A BOOSTER FAN BE INSTALLED/ ADDED. OA IN-LINE DAMPER IS 100% OPEN AND LOUVERS ARE OPEN AND DO NOT HAVE DAMPERS INSTALLED IN THEM.

National TAB

Project: Crave - Westedge

Address: 99 WESTEDGE STE 1100 CHARLESTON, SC

Asset: AHU-2 (EXISTING) **Area: DINING AREA**

Unit Data	
MFG	CARRIER
Model Num	FB4CNPO48
Serial Num	2017A83740

Motor Data	
Motor MFG	N/L
Horsepower	0.75
Motor Rpm	N/L
Phase	1
Voltage (rated)	208
Amperage (rated)	6

Test Data		
	Design	**Actual**
SA CFM	1600	1450
Fan Speed		HIGH
OA CFM	400	151
RA CFM	1200	1299
RL Voltage	208	211
RL Amperage		3.1
Suction ESP		-0.571
Discharge ESP		0.105
Total ESP	0.5	0.676
Brake HP		N/A

Asset	Area Served	Type	Size	DESIGN CFM	Prelim CFM	FINAL CFM	% to design
2-1	100	A	12X12	300	272	290	0.97
2-2	100	A	12X12	300	266	279	0.93
2-3	100	A	12X12	300	278	302	1.01
2-4	100	A	12X12	350	407	325	0.93
2-5	GAMING	A	12X12	350	223	254	0.73
				1600		**1450**	**0.91**

Notes:

THE OUTSIDE AIR DUCT IS NOT DUCTED TO THE UNIT, UNIT HAS OPEN RETURN AND IS NOT ABLE TO PULL THE REQUIRED CFM THROUGH DUCTWORK. RECOMMEND A BOOSTER FAN BE INSTALLED/ ADDED. OA IN-LINE DAMPER IS 100% OPEN AND LOUVERS ARE OPEN AND DO NOT HAVE DAMPERS INSTALLED IN THEM.

SGRD5 DAMPER IS 100% OPEN UNIT IS RUNNING IN HIGH SPEED, GRILLe IS UNABLE TO REACH DESIGN CFM. UNIT TOTAL IS WITHIN DESIGN.

National TAB

Project: Crave - Westedge

Address: 99 WESTEDGE STE 1100 CHARLESTON, SC

Asset: AHU-3 (EXISTING) **Area: DINING AREA**

Unit Data	
MFG	CARRIER
Model Num	FB4CNP048
Serial Num	2017A83733

Motor Data	
Motor MFG	N/L
Horsepower	0.75
Motor Rpm	N/L
Phase	1
Voltage (rated)	208
Amperage (rated)	6

Test Data		
	Design	**Actual**
SA CFM	1600	1456
Fan Speed		HIGH
OA CFM	275	90
RA CFM	1325	1366
RL Voltage	208	211
RL Amperage		3.3
Suction ESP		-0.679
Discharge ESP		0.25"
Total ESP	0.5	0.929
Brake HP		N/A

Asset	Area Served	Type	Size	DESIGN CFM	Prelim CFM	FINAL CFM	% to design
3-1	106	B	24X24	250	281	236	0.94
3-2	108	C	9X9	75	88	72	0.96
3-3	107	C	9X9	75	55	68	0.91
3-4	104	B	24X24	150	207	151	1.01
3-5	108	C	9X9	50	49	55	1.10
3-6	100	A	12X12	300	273	293	0.98
3-7	100	A	12X12	275	55	185	0.67
3-8	100	A	12X12	425	375	396	0.93
				1600		**1456**	**0.91**

Notes:

OUTSIDE AIR DUCT IS NOT DUCTED TO THE UNIT, UNIT HAS OPEN RETURN AND IS NOT ABLE TO PULL THE REQUIRED CFM THROUGH DUCTWORK. RECOMMEND A BOOSTER FAN BE INSTALLED/ ADDED. OA IN-LINE DAMPER IS 100% OPEN AND LOUVERS ARE OPEN AND DO NOT HAVE DAMPERS INSTALLED IN THEM.

SGRD7 DAMPER IS 100% OPEN UNIT IS RUNNING IN HIGH SPEED, GRILL IS UNABLE TO REACH DESIGN CFM. UNIT TOTAL IS WITHIN DESIGN.

National TAB

Project: Crave - Westedge

Address: 99 WESTEDGE STE 1100 CHARLESTON, SC

Asset: AHU-3 (EXISTING) **Area: PRODUCTION AREA**

Unit Data	
MFG	CARRIER
Model Num	FB4CNP048
Serial Num	2017A83755

Motor Data	
Motor MFG	N/L
Horsepower	0.75
Motor Rpm	N/L
Phase	1
Voltage (rated)	208
Amperage (rated)	6

Test Data		
	Design	**Actual**
SA CFM	1600	1477
Fan Speed		HIGH
OA CFM	175	65
RA CFM	1425	1412
RL Voltage	208	211
RL Amperage		2.8
Suction ESP		-0.393
Discharge ESP		0.16
Total ESP	0.5	0.553
Brake HP		N/A

Asset	Area Served	Type	Size	DESIGN CFM	Prelim CFM	FINAL CFM	% to design
4-1	102	B	12X12	200	167	181	0.91
4-2	102	B	12X12	200	185	190	0.95
4-3	102	A	12X12	200	196	182	0.91
4-4	102	B	12X12	200	184	185	0.93
4-5	100	B	12X12	400	365	379	0.95
4-6	100	B	12X12	400	356	360	0.90
				1600		**1477**	**0.92**

Notes:
OUTSIDE AIR DUCT IS NOT DUCTED TO THE UNIT. UNIT HAS OPEN RETURN AND IS NOT ABLE TO PULL THE REQUIRED CFM THROUGH DUCTWORK. RECOMMEND A BOOSTER FAN BE INSTALLED/ ADDED. OA IN-LINE DAMPER IS 100% OPEN AND LOUVERS ARE OPEN AND DO NOT HAVE DAMPERS INSTALLED IN THEM.

National TAB

Project: Crave - Westedge

Address: 99 WESTEDGE STE 1100 CHARLESTON, SC

Asset: EF-1 **Area: BUILDING EXHAUST**

Unit Data	
MFG	LOREN COOK COMPANY
Model Num	GEMINI 700
Serial Num	N/L
Type	INLINE

Motor Data	
Motor MFG	LOREN COOK COM.
Frame	N/L
Horsepower	149W
Motor Rpm	N/L
Phase	1
Voltage (rated)	115
Amperage (rated)	3.9
Service Factor	1

Test Data		
	Design	**Actual**
CFM	750	781
Fan RPM	900	DD / HIGH
RL Voltage	115	121
RL Amperage	3.9	3.9
Suction ESP	-	-0.219
Total ESP	0.5	0.219

Asset	Area Served	Type	Size	DESIGN	CFM(1)	FINAL CFM	% to design
E1-1	108	E	10X10	125	142	119	0.95
E1-2	102	E	10X10	125	144	124	0.99
E1-3	102	E	10X10	300	244	250	0.83
E1-4	107	E	10X10	125	141	128	1.02
E1-5	108	E	10X10	75	119	77	1.03
				750		**698**	**0.93**

Notes:
EF1 - EGRD3 IS LOW OF DESIGNCFM DAMPER IS 100% OPEN. FAN TOTAL IS WITHIN DESIGN CFM. FAN IS RUNNING IN HIGH SPEED

AHU-1

AHU - 2

AHU - 3

AHU - 4