Report By:

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

NATIONAL TAB

Comfort. Under control.

Report: TAB REPORT
Function: Test, Adjust, & Balance
Date: 05/05/2023

PROJECT

04-17-23 IHOP - COCKEYSVILLE, MD

150 CRANBROOK RD

COCKEYSVILLE, MD 21030

Client

B & L Construction, Inc.
1081 Poplar Trace

Danville, VA 24540

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

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Issue List

- RTU-4 is always running

CheckList List

- TECH - SITE PICTURE
- TECH - STEP 1: INITIAL WALKTHROUGH
- TECH - STEP 2: UNIT DATA AND EVAL
- TECH - STEP 3: TEST, ADJUST AND BALANCE
- TECH - STEP 4: FINAL TESTS

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04-17-23 IHOP - COCKEYSVILLE, MD

Project Issue Information

Issue Name : RTU-4 is always running

Description : RTU-4 is always running with stage 2 cooling being active and does not look like it is controlled by the thermostat. Recommend having Mechanical contractor to troubleshoot thermostat wiring.

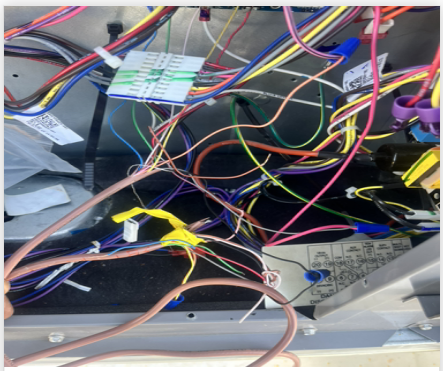
Created By : National TAB **Assigned To :** National TAB - David Annan

Status : Open

Originated Date : 05/17/2023 - David Annan - National TAB

Project Issue File Details

Thermostat
05/17/2023



Thermostat-2
05/17/2023

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Project Summary

The summary below provides a quick understanding of our scope of work and general testing procedures. Enclosed in the report is further detail about your building performance including recommendations, asset data, and pictures. 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 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.

RTU's (Roof Top Units) w/ Diffusers
Each of the RTU's were measured at their terminal devices or via traverse to establish a total flow for that unit. Each RTU was adjusted to within tolerance of the engineer's design flow. Each outlet was then adjusted to within tolerance of the design flow. Outside air was measured by reading the intake air opening with a velocity grid and multiplying by the free area. The outside air damper was adjusted until the airflow was within the design requirements. Any equipment that fell outside of that 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 within tolerance of the design flow. . Any EF's that fell outside of this tolerance is noted throughout the report.

MUA (Make Up Air Unit) w/ PSP
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 design tolerance. Any MUA's that fell outside of this tolerance is noted throughout the report.

General Exhaust Fans w/ Grilles
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 tolerance of design. 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.

Final Building Tests
After completing the test and balance the final building pressure was measured. It was confirmed that the building pressure fell within acceptable tolerances of -0.02" wc to +0.02" wc and that the pressure measurement coincides with the actual and design net airflow. Any deviations from these standards are noted throughout the report.
The hood capture was tested at the perimeter of the hood and the cook top level with the equipment heat on to ensure satisfactory hood capture and containment.

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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	DINING	3040	3183	2275	2390	765	793	25.2%	24.9%						
RTU-2	DINING	3040	3175	2275	2368	765	807	25.2%	25.4%						
RTU-3	DINING	2160	2206	1620	2206	540	0	25.0%	0.0%						
RTU-4	KITCHEN	6650	6395	5300	4811	1350	1584	20.3%	24.8%						
MUA-1	COOKLINE									4425	4362				
KEF-1	HOOD 1											1665	1810		
KEF-2	HOOD 2											1665	1797		
KEF-3	HOOD 3											1665	1797		
KEF-4	HOOD 4											600	641		
DEF-1	DISH HOD											900	891		
TEF-1	RESTROOMS													600	606
TOTALS		14890	14959	11470	11775	3420	3184			4425	4362	6495	6936	600	606

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	7845	7546
TOTAL EXHAUST	7095	7542
NET AIRFLOW	750	4

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H20)
FRONT	0.0137
SIDE	-
REAR	0.0043
AVERAGE	**0.009**

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:

OA intake for RTU-1, RTU-2, and RTU-4 were increased to compensate missing OA from RTU-3

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CheckList Information

Name :	TECH - SITE PICTURE	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		

CheckList Item Details

STORE FRONT

Storefront
05/03/2023

RTU-1

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RTU-1
05/03/2023

RTU-2

RTU-2(1)
05/03/2023

RTU-3

RTU-3
05/03/2023

RTU-4

RTU-4
05/03/2023

KEF-1

KEF-1
05/03/2023

KEF-2

KEF-2
05/03/2023

KEF-3

KEF-3
05/03/2023

KEF-4

KEF-4
05/03/2023

DEF-1

DEF-1
05/03/2023

TEF-1

TEF-1
05/03/2023

HOOD 1

Hood-1
05/03/2023

HOOD 2

Hood-2
05/03/2023

HOOD 3

Hood-3
05/03/2023

HOOD 4

Hood-4
05/03/2023

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CheckList Information

Name :	TECH - STEP 1: INITIAL WALKTHROUGH	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		

CheckList Item Details

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?	Yes

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CheckList Information

Name :	TECH - STEP 2: UNIT DATA AND EVAL	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		

CheckList Item Details

UNIT DATA AND EVALUATION WHILE GATHERING UNIT DATA CHECK THE FOLLOWING:

RTU's/AHU's	
Economizers are assembled and functional?	RTU-3 (Temporary) does not have an economizer. RTU-4 economizer not functional.
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?	NA
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

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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

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CheckList Information

Name :	TECH - STEP 3: TEST, ADJUST AND BALANCE	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		

CheckList Item Details

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".	Yes

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CheckList Information

Name :	TECH - STEP 4: FINAL TESTS	**Status :**	Not Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		

CheckList Item Details

FINAL TESTS	
HOOD CAPTURE TEST	
List equipment turned on for testing	Grill,Fryer, Stove
List smoke candle type used	Live Cooking
Smoke test capture - Perimeter of hood	100%
Smoke test capture - Top of cooking surface	100%
WITNESS	
Date test was completed	04/18/2023
TAB tech name / Firm	David Annan
Site super name / Firm	NA
Owner representative name / Firm (if Applicable)	IHOP
Building pressure at front & back doors (All Systems On)	Front: 0.0137" Rear:0.0043"
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

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: AHU/RTU

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Asset: RTU1 AREA:DINING ENTRY

Unit Data		
	Design	**Actual**
MFG	LENNOX	Carrier
Serial Num	-	48F02M08A2A5A0A0A0
Model Num	LGH102	48F02M08A2A5A0A0A0
Type	RTU	RTU
Configuration	VERTICAL	Vertical
Num OA Filters 1	-	2
OA Filter Size 1	-	16X23
Num Final Filter 1	-	4
Final Filter Size 1	-	16X20X2

Motor Data		
	Design	**Actual**
Motor MFG	-	N/L
Frame	-	N/L
Horsepower	2	2
Motor Rpm	-	N/L
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	6.4

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	3040	3183
SF RPM	858	NA
RA CFM	2275	2059
OA CFM	765	1124
RL Voltage	-	205/206/206
RL Amperage	-	4.3/4.4/4.5
SF Rotation	-	CCW
RA Damper Position	-	86%
Min OA Damper Position	-	14%
Min OA Damper Type	-	SBD
OA Enthalpy Setpt	-	NA

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.63"
Fan Suction SP	-	-1.04"
Fan Discharge SP	-	0.41"
Total ESP	0.75"	1.04"
Fan Total SP	-	1.45"

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

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Diffuser Supply (GRD)

RTU1/DINING ENTRY

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	LOBBY	SD	12"	400	1	261	242	392	98.0
SGRD2	DINING	GD	9"	200	1	73	117	191	95.5
SGRD3	DINING	GD	9"	200	1	85	109	184	92.0
SGRD4	DINING	CD	12	320	1	279	217	349	109.1
SGRD5	DINING	CD	10"	320	1	73	204	324	101.3
SGRD6	DINING	CD	10"	320	1	450	219	350	109.4
SGRD7	DINING	CD	10"	320	1	281	203	325	101.6
SGRD8	DINING	CD	10"	320	1	200	241	397	124.1
SGRD9	DINING	CD	10"	320	1	262	206	331	103.4
SGRD10	DINING	CD	10"	320	1	61	212	340	106.3

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: AHU/RTU

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Asset: RTU2 AREA:DINING MAIN

Unit Data		
	Design	**Actual**
MFG	LENNOX	Carrier
Serial Num	-	3822P3890
Model Num	LGH102	48FCEM08A2A5A0A0A0
Type	RTU	RTU
Configuration	VERTICAL	Vertical
Num OA Filters 1	-	2
OA Filter Size 1	-	16X23
Num Final Filter 1	-	4
Final Filter Size 1	-	16X20X2

Motor Data		
	Design	**Actual**
Motor MFG	-	N/L
Frame	-	N/L
Horsepower	2	2
Motor Rpm	-	N/L
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	6.4

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	3040	3175
SF RPM	858	NA
RA CFM	2275	2082
OA CFM	765	1093
RL Voltage	-	202/202/203
RL Amperage	-	4.3/5.1/5.5
SF Rotation	-	CCW
RA Damper Position	-	%
Min OA Damper Position	-	14%
Min OA Damper Type	-	SBD
OA Enthalpy Setpt	-	NA

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.72"
Fan Suction SP	-	-1.15"
Fan Discharge SP	-	0.49"
Total ESP	0.75"	1.21"
Fan Total SP	-	1.64"

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

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Diffuser Supply (GRD)

RTU2/DINING MAIN

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	DINING	CD	10"	380	1	234	230	414	108.9
SGRD2	DINING	CD	10"	380	1	207	220	392	103.2
SGRD3	DINING	CD	10"	380	1	215	226	401	105.5
SGRD4	DINING	CD	10"	380	1	195	210	378	99.5
SGRD5	DINING	CD	10"	380	1	231	231	417	109.7
SGRD6	DINING	CD	10"	380	1	208	215	384	101.1
SGRD7	DINING	CD	10"	380	1	208	214	386	101.6
SGRD8	DINING	CD	10"	380	1	275	224	403	106.1

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: AHU/RTU

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Asset: RTU3 AREA:DINING-TORP

Unit Data		
	Design	**Actual**
MFG	LENNOX	Carrier
Serial Num	-	4922C07884
Model Num	LGH074	48FCEM07A2A5A0A0A0
Type	RTU	RTU
Configuration	VERTICAL	Vertical
Num OA Filters 1	-	NA
OA Filter Size 1	-	NA
Num Final Filter 1	-	4
Final Filter Size 1	-	16X16X2

Motor Data		
	Design	**Actual**
Motor MFG	-	N/L
Frame	-	N/L
Horsepower	2	2
Motor Rpm	-	N/L
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	4.5

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	2160	2206
SF RPM	833	NA
RA CFM	1620	2206
OA CFM	540	0
RL Voltage	-	202/201/202
RL Amperage	-	0.9/0.9/0.8
SF Rotation	-	CCW
RA Damper Position	-	100%
Min OA Damper Position	-	NA
Min OA Damper Type	-	NA
OA Enthalpy Setpt	-	NA

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.19"
Fan Suction SP	-	-0.47"
Fan Discharge SP	-	0.41"
Total ESP	0.75"	0.60"
Fan Total SP	-	0.89"

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

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Diffuser Supply (GRD)

RTU3/DINING-TORP

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	DINING	CD	10"	355	1	160	190	340	95.8
SGRD2	DINING	CD	10"	355	1	219	214	383	107.9
SGRD3	DINING	CD	10"	290	1	182	172	307	105.9
SGRD4	DINING	CD	10"	290	1	174	163	293	101.0
SGRD5	DINING	CD	10"	290	1	182	185	317	109.3
SGRD6	DINING	CD	10"	290	1	178	165	296	102.1
SGRD7	DINING	CD	10"	290	1	155	140	270	93.1

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: AHU/RTU

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Asset: RTU4 AREA:KITCHEN

Unit Data		
	Design	**Actual**
MFG	LENNOX	Carrier
Serial Num	-	4322P15878
Model Num	LGH210	48HCEE20B2M5A6W4J0
Type	RTU	RTU
Configuration	VERTICAL	Vertical
Num OA Filters 1	-	4
OA Filter Size 1	-	14.5X23
Num Final Filter 1	-	6
Final Filter Size 1	-	20X25X2

Motor Data		
	Design	**Actual**
Motor MFG	-	Marathon
Frame	-	145TZ
Horsepower	5	4.9 BHP
Motor Rpm	-	1745
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	14

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	VP50
Motor Bore Size	-	7/8"
Motor Sheave SetPt	-	3 Turns Out
Fan Sheave Size	-	BK110
Fan Sheave Bore	-	1 3/16"
Belt CL Distance	-	11 1/2"
Num of Belts	-	1
Belt Size	-	BX49
Belt Alignment	-	Good

Test Data		
	Design	**Actual**
SF CFM	6650	6395
SF RPM	1350	872
RA CFM	5300	5037
OA CFM	1350	1358
RL Voltage	-	206/206/206
RL Amperage	-	4.2/5.3/4.7
SF Rotation	-	CCW
RA Damper Position	-	Marked
Min OA Damper Position	-	Marked
Min OA Damper Type	-	OBD
OA Enthalpy Setpt	-	NA

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.57"
Fan Suction SP	-	-0.91"
Fan Discharge SP	-	0.40"
Total ESP	0.75"	0.97"
Fan Total SP	-	1.31"

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

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Project:04-17-23 IHOP - COCKEYSVILLE, MD

AHU/RTU

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Diffuser Supply (GRD)

RTU4/KITCHEN

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	MENS RESTROOMS	GD	8"	175	1	174	170	170	97.1
SGRD2	E.E RESTROOM	GD	8"	60	1	72	57	57	95.0
SGRD3	WOMENS RESTROOMS	GD	8"	175	1	190	180	180	102.9
SGRD4	SERVICE AREA	KD	12"	500	1	297	475	475	95.0
SGRD5	SERVICE AREA	KD	12"	500	1	345	469	469	93.8
SGRD6	SERVICE AREA	KD	12"	500	1	254	470	470	94.0
SGRD7	SERVICE AREA	KD	12"	500	1	284	467	467	93.4
SGRD8	SERVICE AREA	KD	12"	500	1	330	473	473	94.6
SGRD9	OFFICE	KD	10"	200	1	251	204	204	102.0
SGRD10	KITCHEN	KD	12"	500	1	318	465	465	93.0
SGRD11	GALLEY	KD	12"	180	1	149	191	191	106.1
SGRD12	GALLEY	KD	12"	180	1	129	184	184	102.2
SGRD13	GALLEY	KD	12"	180	1	83	190	190	105.6
SGRD14	GALLEY	KD	12"	500	1	262	474	474	94.8
SGRD15	KITCHEN	KD	12"	500	1	233	463	463	92.6
SGRD16	HOOD 1	ACPSP	8"	500	4.17	342	486	486	97.2
SGRD17	HOOD 2	ACPSP	8"	500	4.21	455	497	497	99.4
SGRD18	HOOD 3	ACPSP	8"	500	4.67	360	480	480	96.0

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: FAN - Exhaust

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Asset: DEF1 AREA:DISH HOOD

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	DU33HFA	DU33HFA
Serial Num	-	4302986
Type	UPBLAST	Upblast
Configuration	VERTICAL	Vertical

Motor Data		
	Design	**Actual**
Motor MFG	-	Telco
Frame	-	N/L
Horsepower	0.33	0.33
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	4.3
Service Factor	-	1.15

Test Data		
	Design	**Actual**
CFM	900	891
Fan RPM	1365	1468
Fan Rotation	-	CCW
Motor RPM	-	1468
System SetPt	-	77P
RL Voltage	-	124
RL Amperage	-	1.1
Total ESP	0.35"	0.46"
Fan Inlet SP	-	-0.46"
Fan Discharge SP	-	ATM

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: KEF1 AREA:HOOD 1

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	DU85HFA	DU85HFA
Serial Num	-	4302986
Type	UPBLAST	Upblast
Configuration	VERTICAL	Vertical

Motor Data		
	Design	**Actual**
Motor MFG	-	HSSA
Frame	-	N/L
Horsepower	0.75	0.75
Motor Rpm	-	1725
Phase	3	3
Voltage (rated)	208	208
Amperage (rated)	-	2.6
Service Factor	-	1.15

Test Data		
	Design	**Actual**
CFM	1665	1810
Fan RPM	1346	891
Fan Rotation	-	CCW
Motor RPM	-	891
System SetPt	-	31 HZ
RL Voltage	-	83/83/83
RL Amperage	-	1.5 "VFD"
Total ESP	1.10"	0.49"
Fan Inlet SP	-	-0.49"
Fan Discharge SP	-	ATM

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: KEF2 AREA:HOOD 2

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	DU85HFA	DU85HFA
Serial Num	-	4302986
Type	UPBLAST	Upblast
Configuration	VERTICAL	Vertical

Motor Data		
	Design	**Actual**
Motor MFG	-	HSSA
Frame	-	N/L
Horsepower	0.75	0.75
Motor Rpm	-	1725
Phase	3	3
Voltage (rated)	208	208
Amperage (rated)	-	2.6
Service Factor	-	1.15

Test Data		
	Design	**Actual**
CFM	1665	1797
Fan RPM	1346	891
Fan Rotation	-	CCW
Motor RPM	-	891
System SetPt	-	31 HZ
RL Voltage	-	
RL Amperage	-	1.5 "VFD"
Total ESP	1.10"	0.42"
Fan Inlet SP	-	-0.42"
Fan Discharge SP	-	ATM

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: KEF3 AREA:HOOD 3

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	DU85HFA	DU85HFA
Serial Num	-	4302986
Type	UPBLAST	Upblast
Configuration	VERTICAL	Vertical

Motor Data		
	Design	**Actual**
Motor MFG	-	HSSA
Frame	-	N/L
Horsepower	0.75	0.75
Motor Rpm	-	1725
Phase	3	3
Voltage (rated)	208	208
Amperage (rated)	-	2.6
Service Factor	-	1.15

Test Data		
	Design	**Actual**
CFM	1665	1797
Fan RPM	1346	891
Fan Rotation	-	CCW
Motor RPM	-	891
System SetPt	-	31 HZ
RL Voltage	-	83/83/83
RL Amperage	-	1.5 "VFD"
Total ESP	1.10"	0.46"
Fan Inlet SP	-	-0.46"
Fan Discharge SP	-	ATM

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System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: KEF4 AREA:HOOD 4

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	DU33HFA	DU33HFA
Serial Num	-	4302986
Type	UPBLAST	Upblast
Configuration	VERTICAL	Vertical

Motor Data		
	Design	**Actual**
Motor MFG	-	Telco
Frame	-	N/L
Horsepower	0.33	0.33
Motor Rpm	-	1800
Phase	3	1
Voltage (rated)	208	115
Amperage (rated)	-	4.3
Service Factor	-	N/L

Test Data		
	Design	**Actual**
CFM	600	641
Fan RPM	1412	1511
Fan Rotation	-	CCW
Motor RPM	-	1511
System SetPt	-	NA
RL Voltage	-	122
RL Amperage	-	1.2
Total ESP	0.80"	0.65"
Fan Inlet SP	-	-0.65"
Fan Discharge SP	-	ATM

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: TEF1 AREA:RESTOOMS

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	DU33HFA	DR33HFA
Serial Num	-	4302986
Type	DOWNBLAST	Downblast
Configuration	VERTICAL	Vertical

Motor Data		
	Design	**Actual**
Motor MFG	-	Telco
Frame	-	N/L
Horsepower	0.33	0.33
Motor Rpm	1307	1800
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	4.3
Service Factor	-	N/L

Test Data		
	Design	**Actual**
CFM	600	606
Fan RPM	1307	1140
Fan Rotation	-	CCW
Motor RPM	-	1140
System SetPt	-	62P
RL Voltage	-	122
RL Amperage	-	0.8
Total ESP	0.50"	0.41"
Fan Inlet SP	-	-0.41"
Fan Discharge SP	-	ATM

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Project:04-17-23 IHOP - COCKEYSVILLE, MD

FAN - Exhaust

Comfort. Under control.

Diffuser Ret/Exh (GRD)

TEF1/RESTOOMS

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
EGRD1				175	1	423	310	310	177.1
EGRD2				300	1	398	296	296	98.7

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: FAN - Supply

Comfort. Under control.

Asset: MUA1 AREA:COOKLINE

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	A2-D.500-20D-MPU	A2-D.500-20D-MPU
Serial Num	-	5838171
Type	MUA	MUA
Configuration	VERTICAL	Vertical

Motor Data		
	Design	**Actual**
Motor MFG	-	Westinghouse
Frame	-	184T
Horsepower	5	5
Motor Rpm	-	1750
Phase	3	3
Voltage (rated)	208	208
Amperage (rated)	-	15
Service Factor	-	1.15

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

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	-	0.46"

Test Data		
	Design	**Actual**
CFM	4425	4362
SF RPM	1834	1648
Motor RPM	-	1648
RL Voltage	-	203/203/203
RL Amperage	-	9.2 "VFD"
Total ESP	-	0.67"
Fan Discharge SP	-	0.67"

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

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: Kitchen Hood Type I

Comfort. Under control.

Asset: HD1 AREA:

Unit Data		
	Design	**Actual**
MFG	NA	CaptiveAire
Model Num	NA	5424 ND-2
Job / Serial Num	-	4302986
Type	-	Type I High Proximity
Hood length	-	100"
Hood Width	-	54"
Supply Plenum Type	-	ACPSP
Supply Plenum Width	-	16"
Supply Plenum Length	-	100"

Test Data Supply		
	Design	**Actual**
Total AK Area	-	11.11
Kv factor (Vel)	-	0.91
Ave FPM(corr)	-	NA
CFM	1474	-

Test Data Exhaust		
	Design	**Actual**
Filter Type	-	Captrate Solo
Filter Size 1	-	16X20
Filter Qty 1	-	6
Filter AK factor size 1	-	2.08
Filter Total AK Area	-	12.48
Filter1 FPM	-	137
Filter2 FPM	-	142
Filter3 FPM	-	153
Filter4 FPM	-	160
Filter5 FPM	-	141
Filter6 FPM	-	134
Filter Ave FPM(corr)	-	145
CFM	1665	1810

Cooking Equipment		
	Design	**Actual**
Item 1	-	Grill
Item 2	-	Grill

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Notes: Readings at the perforated PSP were turbulent and inaccurate. Total was read at the MUA intake.

Date: 04/18/2023

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: Kitchen Hood Type I

Comfort. Under control.

Asset: HD2 AREA:

Unit Data		
	Design	**Actual**
MFG	NA	Captive Aire
Model Num	NA	5424 ND-2
Job / Serial Num	-	4302986
Type	-	Type I Canopy
Hood length	-	101"
Hood Width	-	54"
Supply Plenum Type	-	ACPSP"
Supply Plenum Width	-	16"
Supply Plenum Length	-	101"

Test Data Exhaust		
	Design	**Actual**
Filter Type	-	Captrate Solo
Filter Size 1	-	16X20
Filter Qty 1	-	6
Filter AK factor size 1	-	2.08
Filter Total AK Area	-	12.48
Filter1 FPM	-	137
Filter2 FPM	-	138
Filter3 FPM	-	148
Filter4 FPM	-	139
Filter5 FPM	-	158
Filter6 FPM	-	145
Filter Ave FPM(corr)	-	144
CFM	1665	1797

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

Test Data Supply		
	Design	**Actual**
Total AK Area	-	11.22
Kv factor (Vel)	-	0.91
Num of Readings	-	8
Reading1 FPM	-	206
Reading2 FPM	-	183
Reading3 FPM	-	173
Reading4 FPM	-	223
Reading5 FPM	-	196
Reading6 FPM	-	133
Reading7 FPM	-	159
Reading8 FPM	-	193
Ave FPM(corr)	-	183
CFM	1474	1868

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: Kitchen Hood Type I

Comfort. Under control.

Asset: HD3 AREA:

Unit Data		
	Design	**Actual**
MFG	NA	Captive Aire
Model Num	NA	5424 ND-2
Job / Serial Num	-	4302986
Type	-	Type I High Proximity
Hood length	-	100"
Hood Width	-	54"
Supply Plenum Type	-	ACPSP
Supply Plenum Width	-	16"
Supply Plenum Length	-	112"

Test Data Exhaust		
	Design	**Actual**
Filter Type	-	Captrate Solo
Filter Size 1	-	16X20
Filter Qty 1	-	6
Filter AK factor size 1	-	2.08
Filter Total AK Area	-	12.48
Filter1 FPM	-	141
Filter2 FPM	-	140
Filter3 FPM	-	146
Filter4 FPM	-	151
Filter5 FPM	-	149
Filter6 FPM	-	140
Filter Ave FPM(corr)	-	144
CFM	1665	1797

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

Test Data Supply		
	Design	**Actual**
Total AK Area	-	12.44
Kv factor (Vel)	-	0.91
Num of Readings	-	8
Reading1 FPM	-	167
Reading2 FPM	-	111
Reading3 FPM	-	157
Reading4 FPM	-	207
Reading5 FPM	-	186
Reading6 FPM	-	148
Reading7 FPM	-	179
Reading8 FPM	-	208
Ave FPM(corr)	-	170
CFM	1474	1924

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: Kitchen Hood Type I

Comfort. Under control.

Asset: HD4 AREA:

Unit Data		
	Design	**Actual**
MFG	NA	Captive Aire
Model Num	NA	3650 BD-2
Job / Serial Num	-	4302986
Type	-	Type I Low Proximity
Hood length	-	40"
Hood Width	-	42"
Supply Plenum Type	-	NA

Test Data Exhaust		
	Design	**Actual**
Filter Type	-	Captrate Solo
Filter Size 1	-	16X16
Filter Qty 1	-	2
Filter AK factor size 1	-	1.62
Filter Total AK Area	-	3.24
Filter1 FPM	-	208
Filter2 FPM	-	187
Filter Ave FPM(corr)	-	198
CFM	600	641

Cooking Equipment		
	Design	**Actual**
Item 1	-	Fryer
Item 2	-	Fryer

Test Data Supply		
	Design	**Actual**

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Project: 04-17-23 IHOP - COCKEYSVILLE, MD

System/Unit: Kitchen Hood Type II

Comfort. Under control.

Asset: DISH HD1 AREA:

Unit Data		
	Design	**Actual**
MFG	NA	Captiveaire
Model Num	NA	4824 VHB
Serial Num	-	4302986
Type	-	Type II Canopy
Hood length	-	72"
Hood Width	-	48"

Test Data		
	Design	**Actual**
Exhaust CFM	900	891

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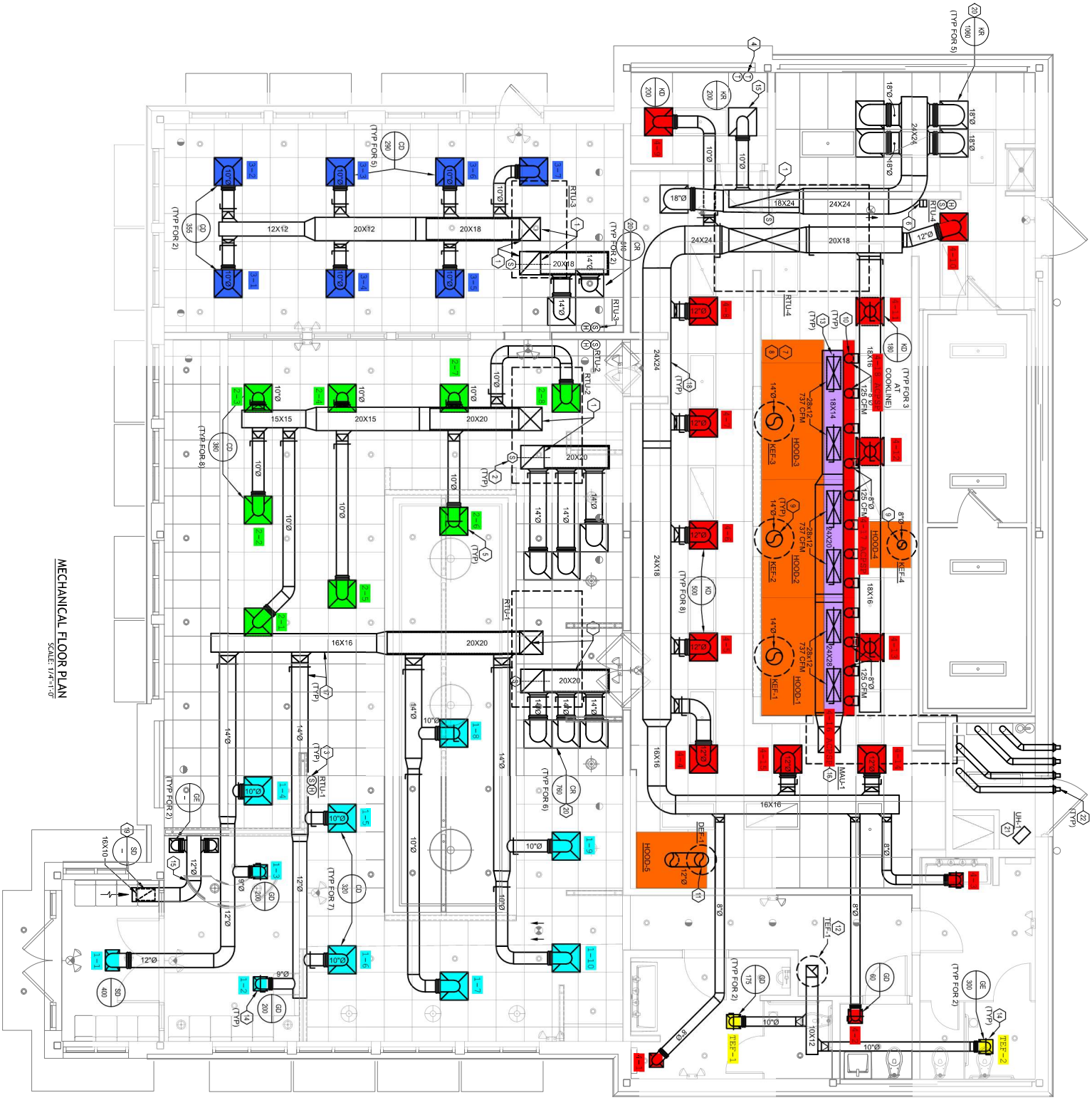

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