

Report By:

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

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Comfort. Under control.

Report: TAB REPORT
Function: Test, Adjust, & Balance
Date: 8/31/2022

PROJECT
08-15 CULVERS - WHEATON, IL

908 E ROOSEVELT RD

WHEATON, IL

Client

Accurex

PO Box 410

Schofield, WI 54476

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Project: 08-15 CULVERS - WHEATON, IL

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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)

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.

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 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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Project: 08-15 CULVERS - WHEATON, IL

System/Unit: AHU/RTU



Comfort. Under control.

Asset: RTU1

AREA: DINING

Unit Data		
	Design	Actual
MFG	LENNOX	CAPTIVE AIRE
Serial Num	-	5313372
Model Num	LGH180H4B	CASRTU3-I.400-24-20T-DOAS
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	4
OA Filter Size 1	-	16X25X2
Num Final Filter 1	-	8
Final Filter Size 1	-	20X25X2

Test Data		
	Design	Actual
SF CFM	6150	5913
SF RPM	-	1755
RA CFM	4350	4045
OA CFM	1800	1868
RL Voltage	-	205 [1]
RL Amperage	-	24.9 [1]
SF Rotation	-	CCW
Min OA Damper Position	-	4.4V
Min OA Damper Type	-	ECONOMIZER
Brake Horse Power	-	10.25

Motor Data		
	Design	Actual
Motor MFG	-	TECO WESTINGHOUSE
Frame	-	215T
Horsepower	-	10.0
Motor Rpm	-	1755
Phase	3	3
Rated Voltage	208/230	230
Rated Amperage	-	24.3

Performance Data		
	Design	Actual
MA Plenum SP	-	1.08"
Fan Suction SP	-	2.88"
Fan Discharge SP	-	0.63"
Total ESP	-	1.71"
Fan Total SP	-	3.51"

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD
Motor Bore Size	-	DD
Motor Sheave SetPt	-	60 HZ
Fan Sheave Size	-	DD
Fan Sheave Bore	-	DD
Belt CL Distance	-	DD
Num of Belts	-	DD
Belt Size	-	DD
Belt Alignment	-	DD

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

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Notes: ADDED +50CFM OF OA TO UNIT TO OBTAIN POSITIVE BUILDING PRESSURE. [1] INFORMATION TAKEN FROM VFD. RECIEVED PERMISSION FROM CAPTIVE AIRE TO PUSH UNIT AS FAR AS UNIT STICKER FLA (27.0A) BASED ON UNIT VOLTAGE OF 205V. [2] SERVED BY LEFT HMI (THERMOSTAT) IN OFFICE.

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Project:08-15 CULVERS - WHEATON, IL

AHU/RTU



Comfort. Under control.

Diffuser Supply (GRD)

RTU1/DINING

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	ENTRY	SD3	8"	150	1.0	163	190	157	104.7
SGRD2	MENS RR	SD4	8"	150	1.0	153	170	145	96.7
SGRD3	WOMENS RR	SD4	8"	150	1.0	145	164	156	104.0
SGRD4	HALL	SD1	12"	450	1.0	303	354	410	91.1
SGRD5	DINING	SD1	8"	150	1.0	184	198	146	97.3
SGRD6	DINING	SD1	8"	150	1.0	230	257	162	108.0
SGRD7	DINING	SD1	8"	150	1.0	85	142	146	97.3
SGRD8	DINING	SD1	8"	150	1.0	150	180	147	98.0
SGRD9	DINING	SD1	8"	150	1.0	161	177	138	92.0
SGRD10	DINING	SD1	8"	150	1.0	126	153	156	104.0
SGRD11	DINING	SD1	8"	150	1.0	141	180	161	107.3
SGRD12	DINING	SD1	8"	150	1.0	169	136	162	108.0
SGRD13	DINING	SD1	8"	150	1.0	105	110	139	92.7
SGRD14	DINING	SD1	8"	150	1.0	126	139	140	93.3
SGRD15	DINING	SD1	8"	150	1.0	140	149	161	107.3
SGRD16	DINING	SD1	8"	150	1.0	153	169	143	95.3
SGRD17	DINING	SD1	8"	150	1.0	102	118	147	98.0
SGRD18	DINING	SD1	8"	150	1.0	180	184	137	91.3
SGRD19	DINING	SD1	8"	150	1.0	164	179	136	90.7
SGRD20	DRINKS & CONDIMENT S	SD1	8"	300	1.0	350	392	309	103.0
SGRD21	ENTRY	SD1	8"	150	1.0	230	248	150	100.0
SGRD22	CUSTOMER ORDERING AREA	SD1	12"	450	1.0	387	426	416	92.4
SGRD23	CUSTOMER SERVICE	SD1	10"	350	1.0	229	250	319	91.1
SGRD24	CUSTOMER SERVICE	SD1	10"	350	1.0	243	294	317	90.6
SGRD25	CUSTOMER SERVICE	SD1	10"	350	1.0	248	271	324	92.6
SGRD26	CUSTOMER SERVICE	SD1	10"	350	1.0	233	269	320	91.4
SGRD27	DRIVE THRU	SD1	12"	500	1.0	313	353	462	92.4
SGRD28	OFFICE	SD1	10"	200	1.0	274	290	207	103.5

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Project: 08-15 CULVERS - WHEATON, IL

System/Unit: AHU/RTU



Comfort. Under control.

Asset: RTU2

AREA: KITCHEN

Unit Data		
	Design	Actual
MFG	LENNOX	CAPTIVE AIRE
Serial Num	-	5313372
Model Num	LGH210H4B	CASRTU3-I.400-24-20T-DOAS
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	4
OA Filter Size 1	-	16X25X2
Num Final Filter 1	-	8
Final Filter Size 1	-	20X25X2

Test Data		
	Design	Actual
SF CFM	6150	6129
SF RPM	-	1755
RA CFM	4450	4341
OA CFM	1700	1788
RL Voltage	-	204 [2]
RL Amperage	-	24.2 [2]
SF Rotation	-	CCW
Min OA Damper Position	-	4.3V
Min OA Damper Type	-	ECONOMIZER
Brake Horse Power	-	9.96

Motor Data		
	Design	Actual
Motor MFG	-	TECO WESTINGHOUSE
Frame	-	215T
Horsepower	-	10.0
Motor Rpm	-	1755
Phase	3	3
Rated Voltage	208/230	230
Rated Amperage	-	24.3

Performance Data		
	Design	Actual
MA Plenum SP	-	-1.11"
Fan Suction SP	-	-2.91"
Fan Discharge SP	-	0.70"
Total ESP	-	1.81"
Fan Total SP	-	3.61"

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD
Motor Bore Size	-	DD
Motor Sheave SetPt	-	60 HZ
Fan Sheave Size	-	DD
Fan Sheave Bore	-	DD
Belt CL Distance	-	DD
Num of Belts	-	DD
Belt Size	-	DD
Belt Alignment	-	DD

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

Completed By: Michael McDonnell

Notes: [1] DIFFUSER 2-14 LOW ON AIRFLOW (480/600CFM-80%) DUE TO INCORRECT NECK SIZE. 10" INSTALLED, PLANS CALL FOR 12". REDUCER INSTALLED BEFORE NECK, CANNOT PUSH ANY MORE AIR TO DIFFUSER WITH ALL OTHER DIFFUSERS ACHIEVING DESIGN. [2] INFORMATION TAKEN FROM VFD. RECIEVED PERMISSION FROM CAPTIVE AIRE TO PUSH UNIT TO UNIT STICKER FLA (27.0A) BASED ON UNIT VOLTAGE OF 204V. [3] SERVED BY RIGHT HMI (THERMOSTAT) IN OFFICE.

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Project:08-15 CULVERS - WHEATON, IL

AHU/RTU



Comfort. Under control.

Diffuser Supply (GRD)

RTU2/KITCHEN

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	SUNDAE SERVICE	SD1	12"	600	1.0	421	552	581	96.8
SGRD2	SUNDAE SERVICE	SD1	12"	600	1.0	447	560	608	101.3
SGRD3	FRYERS	SD5	10"	200	1.0	273	205	211	105.5
SGRD4	FRYERS	SD5	12"	375	1.0	354	391	358	95.5
SGRD5	FOOD PREP	SD5	12"	400	1.0	537	405	424	106.0
SGRD6	FOOD PREP	SD5	12"	400	1.0	429	445	416	104.0
SGRD7	GRIDDLE	SD5	10"	250	1.0	329	298	256	102.4
SGRD8	GRIDDLE	SD5	10"	275	1.0	304	336	281	102.2
SGRD9	EMPLOYEE RESTROOM	SD	6"	75	1.0	133	83	76	101.3
SGRD10	ALCOVE	SD5	8"	125	1.0	245	153	128	102.4
SGRD11	FOOD PREP	SD5	12"	350	1.0	504	405	371	106.0
SGRD12	DISHWASHING	SD5	12"	350	1.0	476	365	339	96.9
SGRD13	DISHWASHING	SD5	12"	350	1.0	487	329	363	103.7
SGRD14	OFFICE	SD1	12"	600	1.0	339	437	480	80.0
SGRD15	DRY GOOD	SD1	12"	600	1.0	451	608	635	105.8
SGRD16	DRY GOODS	SD1	12"	600	1.0	527	633	602	100.3

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Project: 08-15 CULVERS - WHEATON, IL
System/Unit: FAN - Exhaust



Comfort. Under control.

Asset: EF-A1

AREA:MOP ROOM

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XCR-B80	XCR-B80
Serial Num	-	1942448
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	GREENHECK
Frame	-	NL
Horsepower	-	NL
Motor Rpm	900	900
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	0.16
Service Factor	-	NL

Test Data		
	Design	Actual
CFM	75	76
Fan RPM	885	DD
Fan Rotation	-	CW
Motor RPM	-	DD
System SetPt	-	SPEED CONTROLLER SET TO MAX [1]
RL Voltage	-	119
RL Amperage	-	0.13
Total ESP	0.125"	0.09"
Fan Inlet SP	-	ATM
Fan Discharge SP	-	0.09"

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Notes:

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Project: 08-15 CULVERS - WHEATON, IL
System/Unit: FAN - Exhaust



Comfort. Under control.

Asset: PRV1

AREA: RESTROOMS

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XRED-095-D	XRED-090-VG-1-17-X
Serial Num	-	19429773
Type	DOWNBLAST	DOWNBLAST
Configuration	HORIZONTAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	VARI-GREEN
Frame	-	NL
Horsepower	0.0667	0.1
Motor Rpm	1550	300-1750
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	1.38
Service Factor	-	NL

Test Data		
	Design	Actual
CFM	375	0
Fan RPM	1479	DD
Fan Rotation	-	INCORRECT
Motor RPM	-	DD
System SetPt	-	SPEED CONTROLLER [1]
RL Voltage	-	NR [1]
RL Amperage	-	NR [1]
Total ESP	0.5"	NR [1]
Fan Inlet SP	-	NR [1]
Fan Discharge SP	-	ATM

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Notes: [1] FAN NOT BALANCED DUE TO INCORRECT ROTATION. SINGLE PHASE MOTOR COMES FACTORY WIRED AND CANNOT BE CHANGED IN THE FIELD. ACCUREX IS SENDING REPLACEMENT.

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Project:08-15 CULVERS - WHEATON, IL

FAN - Exhaust



Comfort. Under control.

Diffuser Ret/Exh (GRD)

PRV1/RESTROOMS

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
EGRD1	MENS RR	EG1	8X8	150					-
EGRD2	WOMENS RR	EG1	8X8	150					-
EGRD3	EMPLOYEE RR	EG1	8X8	75					-

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Project: 08-15 CULVERS - WHEATON, IL
System/Unit: FAN - Exhaust



Comfort. Under control.

Asset: PRV2

AREA:HD1 GRIDDLE

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XRUB-160XP-15	XRUB-160XP-15
Serial Num	-	19430007
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Test Data		
	Design	Actual
CFM	1500	1530
Fan RPM	2411	2167
Fan Rotation	-	CW
Motor RPM	-	1775
RL Voltage	-	210/212/211
RL Amperage	-	3.1/3.1/3.2
Suction ESP	-	-1.03"
Discharge ESP	-	ATM
Total ESP	2.337"	1.03"

Motor Data		
	Design	Actual
Motor MFG	-	WEG
Frame	-	56
Horsepower	1.5	1.5
Motor Rpm	1725	1760
Phase	3	3
Voltage (rated)	208	230
Amperage (rated)	-	4.20
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	VP44
Motor Bore Size	-	5/8"
Motor Sheave SetPt	-	2 TURNS OPEN
Fan Sheave Size	-	AK30
Fan Sheave Bore	-	1"
Belt CL Distance	-	6"
Num of Belts	-	1
Belt Size	-	AX24

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Notes:

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Project: 08-15 CULVERS - WHEATON, IL
System/Unit: FAN - Exhaust



Comfort. Under control.

Asset: PRV3

AREA:HD2 FRYERS

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XRUB-140-7	XRUB-140-7
Serial Num	-	19430146
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	WEG
Frame	-	56
Horsepower	0.75	0.75
Motor Rpm	1725	1760
Phase	3	3
Voltage (rated)	208	230
Amperage (rated)	-	2.30
Service Factor	-	1.25

Drive Data		
	Design	Actual
Motor Sheave Size	-	VP34S
Motor Bore Size	-	5/8"
Motor Sheave SetPt	-	1.5 TURNS OPEN
Fan Sheave Size	-	AK30
Fan Sheave Bore	-	3/4"
Belt CL Distance	-	5-3/4"
Num of Belts	-	1
Belt Size	-	AP23

Test Data		
	Design	Actual
CFM	1500	1622
Fan RPM	1377	1440
Fan Rotation	-	CW
Motor RPM	-	1778
RL Voltage	-	210/212/211
RL Amperage	-	1.9/1.9/2.0
Suction ESP	-	-0.58"
Discharge ESP	-	ATM
Total ESP	1.0"	0.58"

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Notes:

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Project: 08-15 CULVERS - WHEATON, IL

System/Unit: Kitchen Hood Type I



Comfort. Under control.

Asset: HD1

AREA:GRIDDLE

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XGEP-64-S	XGEP-64-S
Job / Serial Num	-	19451846
Type	TYPE I LOW PROXIMITY	TYPE I LOW PROXIMITY
Hood length	64"	64"
Hood Width	23"	23"

Test Data Exhaust		
	Design	Actual
Filter Type	GREASE GRABBER	GREASE GRABBER
Filter Size 1	16X16	16X16
Filter Qty 1	4	4
Filter AK factor size 1	1.53	1.53
Filter Total AK Area	6.12	6.12
Filter1 FPM	-	258
Filter2 FPM	-	241
Filter3 FPM	-	237
Filter4 FPM	-	265
Filter Ave FPM(corr)	-	250
CFM	1500	1530

Cooking Equipment		
	Design	Actual
Item 1	-	GRIDDLE

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Notes:

Performance Data		
	Design	Actual
Smoke Generation Type	-	45 SEC SMOKE EMITTER
Hood Capture %	-	100%
End Panels Installed (Y/N)	-	NO

General		
	Design	Actual
Third Party Witness	-	VIDEO TAPED
Third Party Company	-	MCCON CONSTRUCTION
Tech Witness	-	MICHAEL MCDONNELL

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Project: 08-15 CULVERS - WHEATON, IL

System/Unit: Kitchen Hood Type I



Comfort. Under control.

Asset: HD2

AREA:FRYER

Unit Data		
	Design	Actual
MFG	ACCUREX	ACCUREX
Model Num	XXEP-83-S	XXEP-83-S
Job / Serial Num	-	19451845
Type	TYPE I LOW PROXIMITY	TYPE I LOW PROXIMITY
Hood length	83"	83"
Hood Width	23"	23"

Test Data Exhaust		
	Design	Actual
Filter Type	X-TRACTOR	X-TRACTOR
Filter Size 1	16X16	16X16
Filter Qty 1	5	5
Filter AK factor size 1	1.53	1.53
Filter Total AK Area	7.65	7.65
Filter1 FPM	-	234
Filter2 FPM	-	194
Filter3 FPM	-	200
Filter4 FPM	-	206
Filter5 FPM	-	226
Filter Ave FPM(corr)	-	212
CFM	1500	1622

Cooking Equipment		
	Design	Actual
Item 1	-	FRYER

Performance Data		
	Design	Actual
Smoke Generation Type	-	45 SEC SMOKE EMITTER
Hood Capture %	-	100%
End Panels Installed (Y/N)	-	NO

General		
	Design	Actual
Third Party Witness	-	VIDEO TAPED
Third Party Company	-	MCCON CONSTRUCTION
Tech Witness	-	MICHAEL MCDONNELL

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Notes:

E5 HVAC PLAN
 SCALE: 1/4" = 1'-0"

