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.

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.

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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.

Comfort. Under control.

10-17 CULVERS - COLUMBIA CITY, IN

CheckList Information

Name :	TECH - STEP 1: INITIAL WALKTHROUGH	**Status :**	NotSubmitted
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?	
Hood is free of alarms?	
Thermostats have power?	
Have trades/general contractor been notified about any issues and are they created on FaciliBuild?	

Notes/Comments :

Comfort. Under control.

10-17 CULVERS - COLUMBIA CITY, IN

CheckList Information

Name :	TECH - STEP 2: UNIT DATA AND EVAL	**Status :**	NotSubmitted
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?	YES
DCV Max damper opening position is set to minimum?	NA
Free cooling enthalpy set point set for lowest setting (Typically "D")	NA
Motors are all operating below the FLA rating?	YES
Are belts tight?	YES
If direct drive unit is the speed controller working.	NA
Is gas piping installed and valves turned on?	YES
Unit free of noticeable noise and vibration	YES
EF's	
Rotation is correct?	
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?	NO BACKDRAFT DAMPER
Unit free of noticeable noise and vibration?	YES
MUA	
Rotation is correct?	NA
Gas piping is installed and valves are in on position?	NA
Heater tested and is functional?	NA
Internal motorized damper is fully opening?	NA
Motor is operating below the FLA rating?	NA
Unit free of noticeable noise and vibration?	NA
HOODS	
Kitchen equipment installed in proper places?	YES
Can kitchen equipment be turned on for final smoke test?	NO
DOCUMENTATION	
Have trades/general contractor been notified about any issues and are they created on FaciliBuild?	YES

Notes/Comments :

Comfort. Under control.

10-17 CULVERS - COLUMBIA CITY, IN

CheckList Information

Name :	TECH - STEP 3: TEST, ADJUST AND BALANCE	**Status :**	NotSubmitted
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?	
Is space comfortable in all areas?	
Is the space free of ventilation noise?	
If deviations from design were necessary to resolve 1-3 what were they? Otherwise put "NA".	

Notes/Comments :

Comfort. Under control.

10-17 CULVERS - COLUMBIA CITY, IN

CheckList Information

Name :	TECH - STEP 4: FINAL TESTS	**Status :**	NotSubmitted
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		

CheckList Item Details

FINAL TESTS	
HOOD CAPTURE TEST	
List equipment turned on for testing	
List smoke candle type used	
Smoke test capture - Perimeter of hood	
Smoke test capture - Top of cooking surface	
WITNESS	
Date test was completed	
TAB tech name / Firm	
Site super name / Firm	
Owner representative name / Firm (if Applicable)	
Building pressure at front & back doors (All Systems On)	
ADDITIONAL	
Do actual net building airflow, design net building airflow, and pressure coincide? If not why? (All three should either be positive or negative)	
Thermostats are programmed?	

Notes/Comments :

Comfort. Under control.

10-17 CULVERS - COLUMBIA CITY, IN

CheckList Information

Name :	TECH - STEP 5: FINAL DOCUMENTATION	**Status :**	NotSubmitted
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		

CheckList Item Details

FINAL DOCUMENTATION

Marked Data capture complete for all assets?	
Picture file sent to processing team or uploaded?	
Balance schedule complete and uploaded?	
Prelim report generated and reviewed?	

Notes/Comments :

National TAB

Project: 10-17 CULVERS - COLUMBIA CITY, IN

System/Unit: AHU/RTU

Comfort. Under control.

Asset: RTU1 AREA:DINING

Unit Data		
	Design	**Actual**
MFG	LENNOX	LENNOX
Serial Num	-	5622C02481
Model Num	LGH240H4B	LGH240H4B
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	3
OA Filter Size 1	-	24x16”
Num Final Filter 1	-	6
Final Filter Size 1	-	24x24x2”

Motor Data		
	Design	**Actual**
Motor MFG	-	NIDEC
Frame	-	184TZ
Horsepower	-	5.00
Motor Rpm	-	1765
Phase	3	3
Rated Voltage	208/230	208/230
Rated Amperage	-	13.8/13.0

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	4.75”
Motor Bore Size	-	1”
Motor Sheave SetPt	-	3 turns out
Fan Sheave Size	-	9.5”
Fan Sheave Bore	-	1.25”
Belt CL Distance	-	20.75”
Num of Belts	-	1
Belt Size	-	BX61
Belt Alignment	-	GOOD

Test Data		
	Design	**Actual**
SF CFM	6150	
SF RPM	-	
RA CFM	4350	
OA CFM	1800	1752
RL Voltage	-	214/214/212
RL Amperage	-	8.2/8.9/9.1
SF Rotation	-	CCW
RA Damper Position	-	OPEN
Min OA Damper Position	-	27%
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	12.00 M.A

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.49
Fan Suction SP	-	-0.75
Fan Discharge SP	-	0.58
Total ESP	-	1.07
Fan Total SP	-	1.33

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

Completed By: Wale Odofin

Notes:

National TAB

Project:10-17 CULVERS - COLUMBIA CITY, IN

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**
RTU1-SGRD1	ENTRY	SD4	8"	150		114			-
RTU1-SGRD2	DINING	SD1	8"	450		416			-
RTU1-SGRD3	DINING	SD1	8"	150		292			-
RTU1-SGRD4	DINING	SD1	8"	150		162			-
RTU1-SGRD5	DINING	SD1	8"	150		169			-
RTU1-SGRD6	DINING	SD1	8"	150		209			-
RTU1-SGRD7	DINING	SD1	8"	150		124			-
RTU1-SGRD8	DINING	SD1	8"	150		215			-
RTU1-SGRD9	DINING	SD1	8"	150		207			-
RTU1-SGRD10	DINING	SD1	8"	150		126			-
RTU1-SGRD11	DINING	SD1	8"	150		215			-
RTU1-SGRD12	DINING	SD1	8"	150		187-			-
RTU1-SGRD13	DINING	SD1	8"	150		193			-
RTU1-SGRD14	DINING	SD1	8"	150		190			-
RTU1-SGRD15	DINING	SD1	8"	150		191			-
RTU1-SGRD16	DINING	SD1	8"	150		163			-
RTU1-SGRD17	DINING	SD1	10"	300		349			-
RTU1-SGRD18	ENTRY	SD1	8"	150		313			-
RTU1-SGRD19	DRIVE THRU	SD1	12"	500		284			-
RTU1-SGRD20	CUSTOMER SERVICE	SD1	10"	350		256			-
RTU1-SGRD21	CUSTOMER SERVICE	SD1	10"	350		273			-
RTU1-SGRD22	CUSTOMER SERVICE	SD1	10"	350		299			-
RTU1-SGRD23	CUSTOMER SERVICE	SD1	10"	350		282			-
RTU1-SGRD24	DINING	SD1	12"	450		578			-
RTU1-SGRD25	DINING	SD1	8"	150		209			-
RTU1-SGRD26	RESTROOM	SD4	8"	150		193			-
RTU1-SGRD27	RESTROOM	SD4	8"	150		191			-
RTU1-SGRD28	MOP ROOM	SD1	8"	200		109			-

Completed By: Wale Odofin on

National TAB

Project: 10-17 CULVERS - COLUMBIA CITY, IN

System/Unit: AHU/RTU

Comfort. Under control.

Asset: RTU2 AREA:KITCHEN

Unit Data		
	Design	**Actual**
MFG	LENNOX	LENNOX
Serial Num	-	5622E03181
Model Num	LGH240H4B	LGH240H4B
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	3
OA Filter Size 1	-	24X16"
Num Final Filter 1	-	6
Final Filter Size 1	-	24X24X2"

Motor Data		
	Design	**Actual**
Motor MFG	-	NIDEC
Frame	-	184TZ
Horsepower	-	5.00
Motor Rpm	-	1765
Phase	3	3
Rated Voltage	208/230	208/230
Rated Amperage	-	13.8-13.0

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	4.75"
Motor Bore Size	-	1"
Motor Sheave SetPt	-	3 turns out
Fan Sheave Size	-	9.5"
Fan Sheave Bore	-	1.25"
Belt CL Distance	-	21"
Num of Belts	-	1
Belt Size	-	BX61
Belt Alignment	-	GOOD

Test Data		
	Design	**Actual**
SF CFM	6225	
SF RPM	-	
RA CFM	4525	
OA CFM	1700	1784
RL Voltage	-	214/212/213
RL Amperage	-	8.2/9.0/9.2
SF Rotation	-	CCW
RA Damper Position	-	OPEN
Min OA Damper Position	-	27%
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	12.00 MA

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.52
Fan Suction SP	-	-0.79
Fan Discharge SP	-	0.57
Total ESP	-	
Fan Total SP	-	

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

Completed By: Wale Odofin

Notes:

National TAB

Project:10-17 CULVERS - COLUMBIA CITY, IN

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**
RTU2-SGRD1	KITCHEN	SD5	10"	200		278	207	194	97.0
RTU2-SGRD2	KITCHEN	SD5	12"	375		628	372	409	109.1
RTU2-SGRD3	KITCHEN	SD5	12"	350		479	561	380	108.6
RTU2-SGRD4	KITCHEN	SD5	12"	400		460	423	386	96.5
RTU2-SGRD5	KITCHEN	SD5	12"	350		501	569	434	124.0
RTU2-SGRD6	KITCHEN	SD5	12"	400		551	395	432	108.0
RTU2-SGRD7	KITCHEN	SD5	12"	350		372	560	392	112.0
RTU2-SGRD8	KITCHEN	SD5	10"	250		383	249	241	96.4
RTU2-SGRD9	KITCHEN	SD5	10"	275		493	269	256	93.1
RTU2-SGRD10	SUNDAE SERVICE	SD1	12"	600		361	462	500	83.3
RTU2-SGRD11	SUNDAE SERVICE	SD1	12"	600		414	366	429	71.5
RTU2-SGRD12	UTILITY ROOM	SD1	12"	600		318	375	418	69.7
RTU2-SGRD13	UTILITY ROOM	SD1	12"	600		299	469	376	62.7
RTU2-SGRD14	DRY GOODS	SD4	6"	75		130	136	78	104.0
RTU2-SGRD15	DRY GOODS	SD1	12"	600		282	502		-
RTU2-SGRD16	DRY GOODS	SD1	10"	200		362	293	185	92.5

Completed By: Wale Odofin on

National TAB

Project: 10-17 CULVERS - COLUMBIA CITY, IN

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: EFA1 AREA:MOP ROOM

Unit Data		
	Design	**Actual**
MFG	ACCUREX	ACCUREX
Model Num	XCRB80	XCRB80
Serial Num	-	NA
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Frame	-	NA
Horsepower	0.01	NA
Motor Rpm	900	NA
Phase	1	NA
Voltage (rated)	115	NA
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	**Actual**
CFM	75	69
Fan RPM	885	NA
Fan Rotation	-	NA
Motor RPM	-	NA
System SetPt	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.125"	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	ATM

Completed By: Wale Odofin

Notes:

National TAB

Project: 10-17 CULVERS - COLUMBIA CITY, IN

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: PRV1 AREA:RESTROOM

Unit Data		
	Design	**Actual**
MFG	ACCUREX	ACCUREX
Model Num	XRED090VG	XRED090VG
Serial Num	-	20584095
Type	DOWNBLAST	DOWNBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	VARI-GREEN
Frame	-	NL
Horsepower	0.060	0.10
Motor Rpm	1725	1750
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	1.38
Service Factor	-	1.0

Test Data		
	Design	**Actual**
CFM	300	370
Fan RPM	1465	1750
Fan Rotation	-	CW
Motor RPM	-	1750
System SetPt	-	NA (no controller)
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.5"	0.39”
Fan Inlet SP	-	-0.39
Fan Discharge SP	-	ATM

Completed By: Wale Odofin

Notes:

National TAB

Project:10-17 CULVERS - COLUMBIA CITY, IN

FAN - Exhaust

Comfort. Under control.

Diffuser Ret/Exh (GRD)

PRV1/RESTROOM

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
PRV1-EGRD1	RESTROOM	EG1	10X10	150		152			-
PRV1-EGRD2	RESTROOM	EG1	10X10	150		218			-

Completed By: Wale Odofin on

National TAB

Project: 10-17 CULVERS - COLUMBIA CITY, IN

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: PRV2 AREA:KITCHEN HOOD

Unit Data		
	Design	**Actual**
MFG	ACCUREX	ACCUREX
Model Num	XRUB160XP15	XRUB160XP15
Serial Num	-	20584214
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NEMA
Frame	-	56H
Horsepower	1.29	1.5
Motor Rpm	1725	1760
Phase	3	3
Voltage (rated)	208	208
Amperage (rated)	-	4.20
Service Factor	-	1.15

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	3"
Motor Bore Size	-	1"
Motor Sheave SetPt	-	2.5 turns out
Fan Sheave Size	-	4"
Fan Sheave Bore	-	0.5"
Belt CL Distance	-	6.25"
Num of Belts	-	1
Belt Size	-	AP23

Test Data		
	Design	**Actual**
CFM	1500	
Fan RPM	2411	
Fan Rotation	-	CW
Motor RPM	-	
RL Voltage	-	
RL Amperage	-	
Suction ESP	-	
Discharge ESP	-	ATM
Total ESP	2.337"	

Completed By: Wale Odofin

Notes:

National TAB

Project: 10-17 CULVERS - COLUMBIA CITY, IN

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: PRV3 AREA:KITCHEN HOOD

Unit Data		
	Design	**Actual**
MFG	ACCUREX	ACCUREX
Model Num	XRUB140-7	XRUB1407
Serial Num	-	20594193
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

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

Drive Data		
	Design	**Actual**
Motor Sheave Size	-	4"
Motor Bore Size	-	0.625"
Motor Sheave SetPt	-	2 turns out
Fan Sheave Size	-	3"
Fan Sheave Bore	-	0.5"
Belt CL Distance	-	6"
Num of Belts	-	1
Belt Size	-	A23

Test Data		
	Design	**Actual**
CFM	1500	
Fan RPM	1377	
Fan Rotation	-	
Motor RPM	-	
RL Voltage	-	
RL Amperage	-	
Suction ESP	-	
Discharge ESP	-	
Total ESP	1"	

Completed By: Wale Odofin

Notes:

National TAB

Project: 10-17 CULVERS - COLUMBIA CITY, IN

System/Unit: Kitchen Hood Type I

Comfort. Under control.

Asset: HD1 AREA:KITCHEN

Unit Data		
	Design	**Actual**
MFG	ACCUREX	ACCUREX
Model Num	XGEP64-S	XGEP64-S
Job / Serial Num	-	20569612
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	-	238
Filter2 FPM	-	216
Filter3 FPM	-	294
Filter4 FPM	-	273
Filter Ave FPM(corr)	-	255
CFM	1500	1560

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

Completed By: Jack Bain

Notes:

National TAB

Project: 10-17 CULVERS - COLUMBIA CITY, IN

System/Unit: Kitchen Hood Type I

Comfort. Under control.

Asset: HD2 AREA:KITCHEN

Unit Data		
	Design	**Actual**
MFG	ACCUREX	ACCUREX
Model Num	XXEP83-S	XXEP83-S
Job / Serial Num	-	20569609
Type	TYPE I LOW PROXIMITY	TYPE I LOW PROXIMITY
Hood length	83	83"
Hood Width	23	23"

Test Data Exhaust		
	Design	**Actual**
Filter Type	XTRACTOR	GREASE GRABBER
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	-	220
Filter2 FPM	-	199
Filter3 FPM	-	212
Filter4 FPM	-	203
Filter5 FPM	-	208
Filter Ave FPM(corr)	-	208
CFM	1500	1591

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

Completed By: Jack Bain

Notes: