

Report By:

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Comfort. Under control.

**Report: FINAL TAB REPORT
Function: Test, Adjust, & Balance
Date: 09/27/2022**

**PROJECT
09-26 NIKE - THE WOODLANDS, TX**

9595 SIX PINES DR

THE WOODLANDS, TX

Client

Alliance Retail Construction Inc.
5952 Clark Center Ace
Sarasota, FL 34238

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Project: 09-26 NIKE - THE WOODLANDS, TX

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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

Each of the RTU's were measured at their terminal devices utilizing a flow hood. The sum of these readings is equal to the total flow for that particular unit. The total flow of each RTU was then adjusted within tolerance of the specified design. Each terminal diffuser was balanced to within tolerance of the engineer's design volume utilizing the provided hand damper located at the takeoff of the main & branch trunk line(s). Any equipment that fell outside of this tolerance is noted throughout the report.

Variable Air Volume (VAV) Terminals

The VAV's were calibrated in a call for max cooling and the correction factors are reported on the individual asset. While in a call for full cooling, the individual air devices were then balanced within design tolerance. The VAVs were then stroked to minimum cool and the airflow values reported. The VAV was then stroked to heating and the airflow values reported. It was verified that there was a sufficient temp rise on each VAV.

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.

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	SALES	3660	3681	2675	2726	985	955	26.9%	25.9%						
RTU-2	BOH	2135	2164	1785	1797	350	367	16.4%	17.0%						
EF-1	RESTROOM													200	200
EF-2	IT CLOSET													1000	990
TOTALS		5795	5845	4460	4523	1335	1322			0	0	0	0	200	200

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	1335	1322
TOTAL EXHAUST	200	200
NET AIRFLOW	1135	1122

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H2O)
FRONT	0.017
SIDE	-
REAR	0.016
AVERAGE	0.0165

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:

EF-2 DOES NOT EXHAUST AIR TO OUTSIDE. EF-2 AIR FLOW REMOVED FROM NET PRESSURIZATION CALCULATION.



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CheckList Information

Name : TECH - SITE PICTURES **Status :** Submitted
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB

CheckList Item Details

STORE FRONT



Image_2022_09_22T2304...

RTU-1



Image_2022_10_02T1844...

RTU-1 CURB/ROOF TOP DUCT



Image_2022_10_02T1844...

RTU-2



Image_2022_10_02T1844...

RTU-2 CURB/ROOF TOP DUCT



Image_2022_10_02T1844...

EF-1



Image_2022_09_22T2309...

EF-2



Image_2022_09_22T2304...

VAV- 1



Image_2022_09_22T2309...

VAV-2



Image_2022_09_22T2309...

Notes/Comments :



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CheckList Information

Name : TECH - STEP 1: INITIAL WALKTHROUGH **Status :** Submitted

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

CheckList Item Details

INITIAL SITE WALKTHROUGH

Review Plan Review Checklist, has it been signed off and meets our standards to start balancing? If not contact processor to ensure job is ready.	YES
All diffusers and grilles are installed and match design?	YES
Thermostats have power?	UNITS RUN OFF BAS.
All HVAC units and fans are powered and operational?	RTUs HAVE POWER. RTU-2 SUPPLY IS DUCTED TO RETURN AND RETURN IS DUCTED TO SUPPLY. MECHANICAL TO CORRECT. RETURN TRIP SCHEDULED FOR 9/30. (RETURN TRIP COMPLETED)
VAV diffusers (if applicable) are powered and responding to adjustment at thermostat?	YES BUT COULD NOT BE SET DUE TO VAV DIFFUSERS BEING DUCTED TO RETURN. (RETURN TRIP COMPLETED. VAV DIFFUSERS SET)
Have trades/general contractor been notified about any issues and are they created on FaciliBuild?	YES

Notes/Comments :



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CheckList Information

Name : TECH - STEP 2: UNIT DATA AND EVAL **Status :** Submitted

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
Motors are all operating below the FLA rating?	RTU-1 OPERATING AT FLA.
Are belts tight?	YES
If direct drive unit is the speed controller working.	N/A
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?	N/A
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?	EF-2 RATTLES DURING OPERATION. UNIT KEPT OFF. FAN TO BE BALANCED ON RETURN TRIP ON 9/30. (RETURN TRIP COMPLETED. EF-2 BALANCED TO DESIGN.)

DOCUMENTATION

Have trades/general contractor been notified about any issues and are they created on FaciliBuild?

YES

Notes/Comments :



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CheckList Information

Name :	TECH - STEP 3: TEST, ADJUST AND BALANCE	Status :	Submitted
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?	GRILLES ON SALES FLOOR ARE NOISY DUE TO BEING DAMPERED NEARLY CLOSED. BRANCH DAMPER MISSING. MECHANICAL TO INSTALL. BRANCH DAMPER TO BE SET AT RETURN TRIP ON 9/30. (RETURN TRIP COMPLETED. BRANCH DAMPER USED TO BALANCE SALES FLOOR GRILLES. VENTILATION NOISE GREATLY REDUCED.)
If deviations from design were necessary to resolve 1-3 what were they? Otherwise put "NA".	NA

FABRIC DUCT STATIC PRESSURES (IF APPLICABLE)

Take static pressures near takeoff for each fabric duct once balancing is completed. Input this into the "VEL (1)" field on the diffuser asset. If not a fabric duct then, put "N/A" into the "VEL (1)" field instead.	NO FABRIC DUCT
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Notes/Comments :



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CheckList Information

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

CheckList Item Details

FINAL TESTS

BUILDING PRESSURE

Building pressure at front & back doors (All Systems On)	FRONT 0.017" BACK 0.016"
Do actual net building airflow, design net building airflow, and pressure coincide? If not why? (All three should either be positive or negative)	YES

CARRIER VFD PARAMETERS (IF APPLICABLE)

Use Carrier provided VFD cable to verify VFD speed parameters for each unit (Defaults - high speed = 60Hz, low speed = 40Hz). Can adjust high speed parameter for balancing but requires that the low speed is proportionally adjusted. Record VFD speeds on the individual assets	N/A
--	-----

TEMPERATURES/HUMIDITIES

Measure temperatures/humidities for outside air (taken in shade), return air, and supply air for each HVAC unit during full cooling and input into appropriate fields on the individual asset	YES
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VAV DIFFUSERS (IF APPLICABLE)

Each VAV-diffuser is calibrated for max airflow?	VAV DIFFUSERS NOT SET YET DUE TO RTU-2 BEING DUCTED BACKWARDS. VAV DIFFUSERS TO BE SET AT RETURN TRIP ON 9/30. (RETURN TRIP COMPLETED. VAV DIFFUSER BALANCE COMPLETED.)
Each VAV diffuser is set for minimum airflow? Record value in notes on the individual diffuser asset	VAV DIFFUSERS NOT SET YET DUE TO RTU-2 BEING DUCTED BACKWARDS. VAV DIFFUSERS TO BE SET AT RETURN TRIP ON 9/30. (RETURN TRIP COMPLETED. VAV DIFFUSER BALANCE COMPLETED.)

Notes/Comments :

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Project: 09-26 NIKE - THE WOODLANDS, TX

System/Unit: AHU/RTU



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Asset: RTU1

AREA:SALES

Unit Data		
	Design	Actual
MFG	CARRIER	CARRIER
Serial Num	-	2522P26569
Model Num	48HCDE17	48HCDE17A2M6A2X1G0
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL DISCHARGE
Num OA Filters 1	-	4
OA Filter Size 1	-	16x24
Num Final Filter 1	-	6
Final Filter Size 1	-	20x25x2

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON
Frame	-	56HZ
Horsepower	-	NL
Motor Rpm	-	1750
Phase	3	3
Rated Voltage	480	460
Rated Amperage	-	4.6

Drive Data		
	Design	Actual
Motor Sheave Size	-	1VM50
Motor Bore Size	-	7/8"
Fan Sheave Size	-	BK100
Fan Sheave Bore	-	1 3/16"
Belt CL Distance	-	12"
Num of Belts	-	1
Belt Size	-	BX44

Electrical		
	Design	Actual

Completed By: Wesley John

Notes:

Test Data		
	Design	Actual
SF CFM	3660	3681
SF RPM	-	826
RA CFM	2675	2726
OA CFM	985	955
RL Voltage	-	479/480/477
RL Amperage	-	4.3/4.6/4.6
SF Rotation	-	CW
RA Damper Position	-	65%
Min OA Damper Position	-	35%
Min OA Damper Type	-	OPPOSED BLADE

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.71"
Fan Suction SP	-	-1.02"
Fan Discharge SP	-	0.62"
Total ESP	1.25"	1.33"
OA Temp (db/wb)	-	100.6/94.9
RA Temp (db/wb)	-	72.1/62.7
SA Temp (db/wb)	-	55.5/49.6

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES

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Project:09-26 NIKE - THE WOODLANDS, TX

AHU/RTU



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Diffuser Supply (GRD)

RTU1/SALES

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	SALES	DSG1	12X8	125	0.54	4567	-	131	104.8
SGRD2	SALES	DSG1	12X8	125	0.54	-	-	127	101.6
SGRD3	SALES	DSG1	12X8	125	0.54	-	-	132	105.6
SGRD4	SALES	DSG1	12X8	125	0.54	--	-	134	107.2
SGRD5	SALES	DSG1	12X8	175	0.54	-	-	192	109.7
SGRD6	SALES	DSG1	12X8	175	0.54	-	-	187	106.9
SGRD7	SALES	DSG1	12X8	175	0.54	-	-	186	106.3
SGRD8	RR HALL	CSD3	6"	65	1.00	-	-	70	107.7
SGRD9	SALES	CSD2	6"	75	1.00	-	-	78	104.0
SGRD10	SALES	CSD2	6"	75	1.00	-	-	78	104.0
SGRD11	SALES	DSG1	12X8	175	0.54	-	-	183	104.6
SGRD12	SALES	DSG1	12X8	175	0.54	-	-	188	107.4
SGRD13	SALES	DSG1	12X8	175	0.54	-	-	182	104.0
SGRD14	SALES	DSG1	12X8	175	0.54	-	-	190	108.6
SGRD15	SALES	DSG1	12X8	175	0.54	-	-	189	108.0
SGRD16	SALES	DSG1	12X8	175	0.54	-	-	180	102.9
VAV1	SOLAR ZONE		12"	1070		-	-	975	91.1
VAV2	FITTING ROOMS		7"	300		-	-	279	93.0

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Asset	Notes
SGRD1	CFM1 COLUMN MEASUREMENT IS A TOTAL TRAVERSE.

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Project: 09-26 NIKE - THE WOODLANDS, TX

System/Unit: AHU/RTU



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Asset: RTU2

AREA:BOH

Unit Data		
	Design	Actual
MFG	CARRIER	CARRIER
Serial Num	-	2822P78836
Model Num	48HCDE08	48HCDE08A2M6A2W1G0
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL DISCHARGE
Num OA Filters 1	-	1
OA Filter Size 1	-	20x36
Num Final Filter 1	-	4
Final Filter Size 1	-	20x20x2

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON
Frame	-	56HZ
Horsepower	-	NL
Motor Rpm	-	1670
Phase	3	3
Rated Voltage	480	460
Rated Amperage	-	3.3

Drive Data		
	Design	Actual
Motor Sheave Size	-	1VL44
Motor Bore Size	-	5/8"
Fan Sheave Size	-	AFD74
Fan Sheave Bore	-	1"
Belt CL Distance	-	16 3/4"
Num of Belts	-	1
Belt Size	-	A48

Electrical		
	Design	Actual

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Notes: SGRD-1 99 CFM @100% / 29 CFM @8% SGRD-2&3 131, 139 CFM @100% / 37, 48 CFM @5% SGRD-4 179 CFM @100% / 54 CFM @12%

Test Data		
	Design	Actual
SF CFM	2135	2164
SF RPM	-	988
RA CFM	1785	1797
OA CFM	350	367
RL Voltage	-	482/482/484
RL Amperage	-	2.8/2.8/2.8
SF Rotation	-	CCW
RA Damper Position	-	75%
Min OA Damper Position	-	25%
Min OA Damper Type	-	OPPOSED BLADE

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.42"
Fan Suction SP	-	-0.68"
Fan Discharge SP	-	0.51"
Total ESP	1.25"	0.93"
OA Temp (db/wb)	-	82.9/60.8
RA Temp (db/wb)	-	72.8/52.8
SA Temp (db/wb)	-	55.6/43.2

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES

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Project:09-26 NIKE - THE WOODLANDS, TX

AHU/RTU



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Diffuser Supply (GRD)

RTU2/BOH

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	QUIET ROOM	CSD1	6"	90	1.0	120	129	99	110.0
SGRD2	BREAK ROOM	CSD1	8"	135	1.0	208	226	131	97.0
SGRD3	BREAK ROOM	CSD1	8"	140	1.0	131	144	139	99.3
SGRD4	COACH'S OFFICE	CSD1	8"	170	1.0	216	235	179	105.3
SGRD5	BOH	CSD2	8"	200	1.0	120	131	194	97.0
SGRD6	ELECTRICAL	CSD3	6"	100	1.0	124	129	108	108.0
SGRD7	IT ROOMS	CSD3	8"	200	1.0	154	167	210	105.0
SGRD8	BOH	CSD2	8"	200	1.0	174	190	198	99.0
SGRD9	BOH	CSD2	8"	200	1.0	120	127	187	93.5
SGRD10	BOH	CSD2	8"	200	1.0	152	163	189	94.5
SGRD11	BOH	CSD2	10"	250	1.0	222	243	261	104.4
SGRD12	BOH	CSD2	8"	175	1.0	213	233	191	109.1
SGRD13	RESTROOM (ADA)	CSD3	6"	75	1.0	89	94	78	104.0

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Project: 09-26 NIKE - THE WOODLANDS, TX

System/Unit: FAN - Exhaust



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Asset: EF1

AREA:RESTROOM

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	SQ-080-VG	SQ-80-VG-X
Serial Num	-	19945953
Type	INLINE	CENTRIFUGAL
Configuration	HORIZONTAL	INLINE

Motor Data		
	Design	Actual
Motor MFG	-	BROAD OCEAN
Frame	-	NL
Horsepower	1/10	0.10
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	NL
Service Factor	-	NL

Test Data		
	Design	Actual
CFM	200	200
Fan RPM	1548	DIRECT DRIVE
Fan Rotation	-	CW
Motor RPM	-	DIRECT DRIVE
System SetPt	-	LOW
RL Voltage	-	121
RL Amperage	-	0.94
Total ESP	0.5"	0.39"
Fan Inlet SP	-	-0.22"
Fan Discharge SP	-	0.17"

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Notes:

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Project:09-26 NIKE - THE WOODLANDS, TX

FAN - Exhaust



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Diffuser Ret/Exh (GRD)

EF1/RESTROOM

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
EGRD1	RESTROOM	CEG1	6"	100	1.0	136	93	97	97.0
EGRD2	JANITOR	CEG1	6"	100	1.0	162	109	103	103.0

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Project: 09-26 NIKE - THE WOODLANDS, TX

System/Unit: FAN - Exhaust



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Asset: EF2

AREA:IT CLOSET

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	SQ-100-VG	SQ-100-VG-4-X
Serial Num	-	19945973
Type	INLINE	CENTRIFUGAL
Configuration	HORIZONTAL	INLINE

Motor Data		
	Design	Actual
Motor MFG	-	BROAD OCEAN
Frame	-	NL
Horsepower	1/4	0.25
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	NL
Service Factor	-	NL

Test Data		
	Design	Actual
CFM	1000	990
Fan RPM	1385	DIRECT DRIVE
Fan Rotation	-	CW
Motor RPM	-	DIRECT DRIVE
System SetPt	-	HIGH
RL Voltage	-	122
RL Amperage	-	1.6
Total ESP	0.3"	0.41"
Fan Inlet SP	-	-0.14"
Fan Discharge SP	-	0.27"

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VAV - Single Duct

3HVAC EQUIPMENT/

Asset									
Asset Name	Type	Size	Design Max CFM	Max CFM	Design Min CFM	Min CFM	Design Heat CFM	Heat CFM	Ak (max)
VAV1	VAV	12"	975	975	0	0	535	540	2250
VAV2	VAV	7"	300	279	175	170	175	178	670

