Report By:

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

Report: TAB REPORT

Function: Test, Adjust, & Balance

Date: 09/30/2024

Completed By: National TAB

PROJECT

09-30-24 DOLLAR TREE - UNION GROVE, WI

1141 15th AVE

UNION GROVE, WI 53182

Client

Oliphant Heating

208 WOLLARD BLVD

RICHMOND, MO

National TAB

Project: 09-30-24 DOLLAR TREE - UNION GROVE, WI

Table Of Contents

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.

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 and that the pressure measurement coincides with the actual and design net airflow. Any deviations from these standards are noted throughout the report.

NATIONAL TAB

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	STORAGE	1750	1801	1600	1661	150	140	8.6%	7.8%						
RTU 2	CHECKOUT	2800	2827	2150	2168	650	659	23.2%	23.3%						
RTU 3	SALES	2800	2837	2150	2164	650	673	23.2%	23.7%						
RTU 4	SALES	3500	3497	2725	2729	775	768	22.1%	22.0%						
EF-1	RR													75	70
EF-2	RR													75	72
EF-3	MOP													50	55
TOTALS		10850	10962	8625	8722	2225	2240			0	0	0	0	200	197

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	2225	2240
TOTAL EXHAUST	200	197
NET AIRFLOW	2025	2043

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H20)
FRONT	0.0241
SIDE	0.0237
REAR	0.0238
AVERAGE	**0.0239**

FINAL CHECKS

ACTUAL NET AIRFLOW COINCIDES WITH DESIGN:	✓
MEASURED PRESSURES COINCIDES WITH ACTUAL NET AIRFLOW:	✓
PRESSURE FALLS WITHIN IMC TOLERANCE OF +/-0.03" W.C.	✓

NOTES:

CheckList List

- TECH - STEP 1: INITIAL WALKTHROUGH
- TECH - STEP 2: UNIT DATA AND EVAL
- TECH - STEP 3: TEST, ADJUST AND BALANCE

09-30-24 DOLLAR TREE - UNION GROVE, WI

CheckList Information

Name :	TECH - STEP 1: INITIAL WALKTHROUGH	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/30/2024 - Laura Robinson - National TAB		
Completed Date :	09/30/2024 - Michael McDonnell - 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.

Comment:

Yes

All diffusers and grilles are installed and match design?

Comment:

Yes

Thermostats have power?

Comment:

Yes

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

Comment:

Yes

09-30-24 DOLLAR TREE - UNION GROVE, WI

CheckList Information

Name :	TECH - STEP 2: UNIT DATA AND EVAL	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/30/2024 - Laura Robinson - National TAB		
Completed Date :	09/30/2024 - Michael McDonnell - 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
Comment:	
DCV Max damper opening position is set to minimum?	Yes
Comment:	
Free cooling enthalpy set point set for lowest setting (Typically "D")	Yes
Comment:	
Motors are all operating below the FLA rating?	Yes
Comment:	
Are belts tight?	

Comment:

NA, units are direct drive.

If direct drive unit is the speed controller working.

Comment:

Yes

Is gas piping installed and valves turned on?	Yes

Comment:

Unit free of noticeable noise and vibration	Yes

Comment:

EF's

Rotation is correct?	Yes

Comment:

Belts are tight?

Comment:

DOCUMENTATION

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

Comment:

Notes/Comments :

[1] RTU-4 Disconnect not operational at time of TAB. Scheduled to be replaced.

Date :09/30/2024

09-30-24 DOLLAR TREE - UNION GROVE, WI

CheckList Information

Name :	TECH - STEP 3: TEST, ADJUST AND BALANCE	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	09/30/2024 - Laura Robinson - National TAB		
Completed Date :	09/30/2024 - Michael McDonnell - National TAB		

CheckList Item Details

TEST, ADJUST, AND BALANCE ALL EQUIPMENT:	
DURING TESTING MAKE NOTE OF THE FOLLOWING:	
Is space free of drafting?	Yes
Comment:	
Is space comfortable in all areas?	Yes
Comment:	
Is the space free of ventilation noise?	Yes
Comment:	
If deviations from design were necessary to resolve 1-3 what were they? Otherwise put "NA".	
Comment:	

National TAB

Project: 09-30-24 DOLLAR TREE - UNION GROVE, WI

System/Unit: AHU/RTU

Asset: RTU 1 AREA:STORAGE

Unit Data		
	Design	**Actual**
MFG	CARRIER	CARRIER
Serial Num	-	3723C10441
Model Num	48FCEM12A2M5A6F1J0	48GCEM05F2M5A6F1C0
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	28X14
Num Final Filter 1	-	2
Final Filter Size 1	-	18X24X2

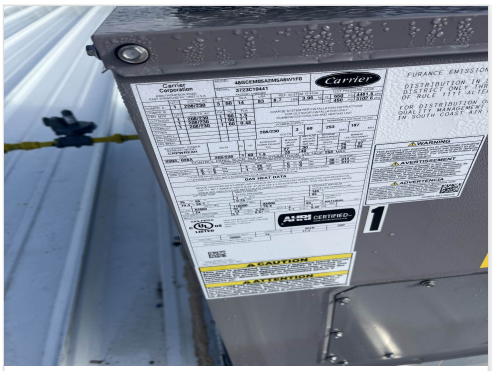
Test Data		
	Design	**Actual**
SF CFM	1750	1801
SF RPM	-	2051
RA CFM	1600	1661
OA CFM	150	140
RL Voltage	-	211
RL Amperage	-	3.6
SF Rotation	-	CORRECT
SF System SetPt	-	9.0 VDC (CAV)
RA Damper Position	-	MECHANICALLY LINKED
Min OA Damper Position	-	3.75V (22%)
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	ES5

Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Horsepower	1.4	NL
Motor Rpm	-	NL
Phase	1	1
Rated Voltage	208	208
Rated Amperage	-	7.1

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.64"
Fan Suction SP	-	-0.92"
Fan Discharge SP	-	0.35"
Total ESP	1.00	0.99"
Fan Total SP	-	1.27

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

Unit Data - PHOTO LOG



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Completed By: Michael McDonnell on 09/30/2024

Diffuser Supply (GRD)

RTU 1/STORAGE

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
RTU 1-SGRD1	STORAGE	D	14X6	375	0.42	280	356	384	102.4
RTU 1-SGRD2	STORAGE	A	8	100	1.0	166	94	102	102.0
RTU 1-SGRD3	STORAGE	D	14X6	375	0.42	284	351	379	101.1
RTU 1-SGRD4	STORAGE	D	14X6	375	0.42	280	348	375	100.0
RTU 1-SGRD5	STORAGE	D	14X6	375	0.42	304	359	387	103.2
RTU 1-SGRD7	STORAGE	C	8	50	1.0	182	42	45	90.0
RTU 1-SGRD8	STORAGE	C	8	50	1.0	113	44	48	96.0
RTU 1-SGRD9	STORAGE	C	8	50	1.0	96	48	81	162.0
Total				1750		1705	1642	1801	102.91%

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National TAB

Project: 09-30-24 DOLLAR TREE - UNION GROVE, WI

System/Unit: AHU/RTU

Asset: RTU 2 AREA:WEST SALES

Unit Data		
	Design	**Actual**
MFG	CARRIER	CARRIER
Serial Num	-	3223P67741
Model Num	48FCEM12A2M5A6F1J0	48HCED08F2M5A6F1J0
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	35X19.5
Num Final Filter 1	-	4
Final Filter Size 1	-	16X20X2

Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Horsepower	2.4	NL
Motor Rpm	-	NL
Phase	3	3
Rated Voltage	208 V	208
Rated Amperage	-	6.4

Test Data		
	Design	**Actual**
SF CFM	2800	2827
SF RPM	-	1446
RA CFM	2150	2168
OA CFM	650	659
RL Voltage	-	211/212/211
RL Amperage	-	2.2/2.3/2.1
SF Rotation	-	CORRECT
SF System SetPt	-	6.8VDC (MSAV)
RA Damper Position	-	MECHANICALLY LINKED
Min OA Damper Position	-	HIGH: 3.8V (22%) LOW: 5.05V (38%)
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	ES5

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.47"
Fan Suction SP	-	-0.68"
Fan Discharge SP	-	0.44"
Total ESP	1.00	0.91"
Fan Total SP	-	1.12"

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

Unit Data - PHOTO LOG

tmp_19c48ce6_2418_439..

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National TAB

Project:09-30-24 DOLLAR TREE - UNION GROVE, WI

AHU/RTU

Diffuser Supply (GRD)

RTU 2/WEST SALES

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
RTU 2-SGRD1	WEST SALES	B	12	350	1.0	502	391	341	97.4
RTU 2-SGRD2	WEST SALES	B	12	350	1.0	535	421	348	99.4
RTU 2-SGRD3	WEST SALES	B	12	350	1.0	522	434	375	107.1
RTU 2-SGRD4	WEST SALES	B	12	350	1.0	485	368	378	108.0
RTU 2-SGRD5	WEST SALES	B	12	350	1.0	444	356	350	100.0
RTU 2-SGRD6	WEST SALES	B	12	350	1.0	391	309	332	94.9
RTU 2-SGRD7	WEST SALES	B	12	350	1.0	482	386	363	103.7
RTU 2-SGRD8	WEST SALES	B	12	350	1.0	451	360	340	97.1
Total				2800		3812	3025	2827	100.96%

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Project: 09-30-24 DOLLAR TREE - UNION GROVE, WI

System/Unit: AHU/RTU

Asset: RTU 3 AREA:EAST SALES

Unit Data		
	Design	**Actual**
MFG	CARRIER	CARRIER
Serial Num	-	3223P67837
Model Num	48FCEM12A2M5A6F1J0	48HCED08F2M5A6F1J0
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	35X19.5
Num Final Filter 1	-	4
Final Filter Size 1	-	16X20X2

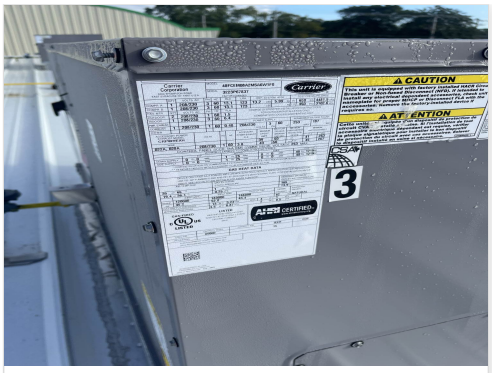
Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Horsepower	2.4	NL
Motor Rpm	-	NL
Phase	3	3
Rated Voltage	208 V	208
Rated Amperage	-	6.4

Test Data		
	Design	**Actual**
SF CFM	2800	2837
SF RPM	-	1448
RA CFM	2150	2164
OA CFM	650	673
RL Voltage	-	212/212/212
RL Amperage	-	2.2/2.4/2.2
SF Rotation	-	CORRECT
SF System SetPt	-	6.8VDC (MSAV)
RA Damper Position	-	MECHANICALLY LINKED
Min OA Damper Position	-	HIGH: 3.85V (23%) LOW: 5.15 (39%)
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	ES5

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.46"
Fan Suction SP	-	-0.68"
Fan Discharge SP	-	0.50"
Total ESP	1.00	0.96"
Fan Total SP	-	1.18"

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

Unit Data - PHOTO LOG



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Completed By: Michael McDonnell on 09/30/2024

Diffuser Supply (GRD)

RTU 3/EAST SALES

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
RTU 3-SGRD1	EAST SALES	B	12	350	1.0	335	355	355	101.4
RTU 3-SGRD2	EAST SALES	B	12	350	1.0	414	370	370	105.7
RTU 3-SGRD3	EAST SALES	B	12	350	1.0	422	338	338	96.6
RTU 3-SGRD4	EAST SALES	B	12	350	1.0	333	343	343	98.0
RTU 3-SGRD5	EAST SALES	B	12	350	1.0	343	370	370	105.7
RTU 3-SGRD6	EAST SALES	B	12	350	1.0	405	351	351	100.3
RTU 3-SGRD7	EAST SALES	B	12	350	1.0	422	345	345	98.6
RTU 3-SGRD8	EAST SALES	B	12	350	1.0	355	365	365	104.3
Total				2800		3029	2837	2837	101.32%

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National TAB

Project: 09-30-24 DOLLAR TREE - UNION GROVE, WI

System/Unit: AHU/RTU

Asset: RTU 4 AREA:SOUTH SALES

Unit Data		
	Design	**Actual**
MFG	CARRIER	CARRIER
Serial Num	-	3523P69284
Model Num	48FCEM12A2M5A6F1J0	48FCEM12A2M5A6F1J0
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	35X19.5
Num Final Filter 1	-	4
Final Filter Size 1	-	20X20X2

Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Horsepower	3.0	NL
Motor Rpm	-	NL
Phase	3	3
Rated Voltage	208 V	208
Rated Amperage	-	6.4

Test Data		
	Design	**Actual**
SF CFM	3500	3497
SF RPM	-	DD
RA CFM	2725	2729
OA CFM	775	768
RL Voltage	-	212/212/212
RL Amperage	-	3.6/3.6/3.4
SF Rotation	-	CORRECT
SF System SetPt	-	7.8VDC (MSAV)
RA Damper Position	-	MECHANICALLY LINKED
Min OA Damper Position	-	HIGH: 4.4V (30%) LOW: 5.75V (46%)
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	ES5

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.56"
Fan Suction SP	-	-0.78"
Fan Discharge SP	-	0.62"
Total ESP	1.00	1.18"
Fan Total SP	-	1.40"

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

Unit Data - PHOTO LOG

tmp_d19e3f2c_ddca_42c..

tmp_28a7fbdc_6292_455..

Completed By: Michael McDonnell on 09/30/2024

Diffuser Supply (GRD)

RTU 4/SOUTH SALES

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
RTU 4-SGRD1	SOUTH SALES	B	12	440	1.0	447	444	444	100.9
RTU 4-SGRD2	SOUTH SALES	B	12	435	1.0	496	434	434	99.8
RTU 4-SGRD3	SOUTH SALES	B	12	435	1.0	502	424	424	97.5
RTU 4-SGRD4	SOUTH SALES	B	12	440	1.0	402	423	423	96.1
RTU 4-SGRD5	SOUTH SALES	B	12	440	1.0	457	476	476	108.2
RTU 4-SGRD6	SOUTH SALES	B	12	435	1.0	532	444	444	102.1
RTU 4-SGRD7	SOUTH SALES	B	12	435	1.0	499	429	429	98.6
RTU 4-SGRD8	SOUTH SALES	B	12	440	1.0	424	423	423	96.1
Total				3500		3759	3497	3497	99.91%

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National TAB

Project: 09-30-24 DOLLAR TREE - UNION GROVE, WI

System/Unit: FAN - Exhaust

Asset: EF1 AREA:RR

Unit Data		
	Design	**Actual**
MFG	BROAN	BROAN
Model Num	AE80B-B	AE80B-B
Serial Num	-	42E22T
Type	CWIING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Phase	-	1
Voltage (rated)	120	115
Amperage (rated)	-	0.3

Test Data		
	Design	**Actual**
CFM	75	70
Fan RPM	-	DD
Fan Rotation	-	CCW, CORRECT
Motor RPM	-	DD
System SetPt	-	SINGLE SPEED
RL Voltage	-	119
RL Amperage	-	NA

Unit Data - PHOTO LOG

tmp_66b96225_8215_476..

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Project: 09-30-24 DOLLAR TREE - UNION GROVE, WI

System/Unit: FAN - Exhaust

Asset: EF2 AREA:RR

Unit Data		
	Design	**Actual**
MFG	BROAN	BROAN
Model Num	AE80B-B	AE80B-B
Serial Num	-	42E15T
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NA
Motor Rpm	-	DD
Phase	-	1
Voltage (rated)	120	115
Amperage (rated)	-	0.3

Test Data		
	Design	**Actual**
CFM	75	72
Fan RPM	-	DD
Fan Rotation	-	CCW CORRECT
Motor RPM	-	DD
System SetPt	-	SINGLE SPEED
RL Voltage	-	120
RL Amperage	-	NA

Unit Data - PHOTO LOG

tmp_532713c2_3ceb_489..

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National TAB

Project: 09-30-24 DOLLAR TREE - UNION GROVE, WI

System/Unit: FAN - Exhaust

Asset: EF3 AREA:MOP

Unit Data		
	Design	**Actual**
MFG	BROAN	BROAN
Model Num	NL	NL
Serial Num	-	NL

Test Data		
	Design	**Actual**
CFM	50	55

Unit Data - PHOTO LOG

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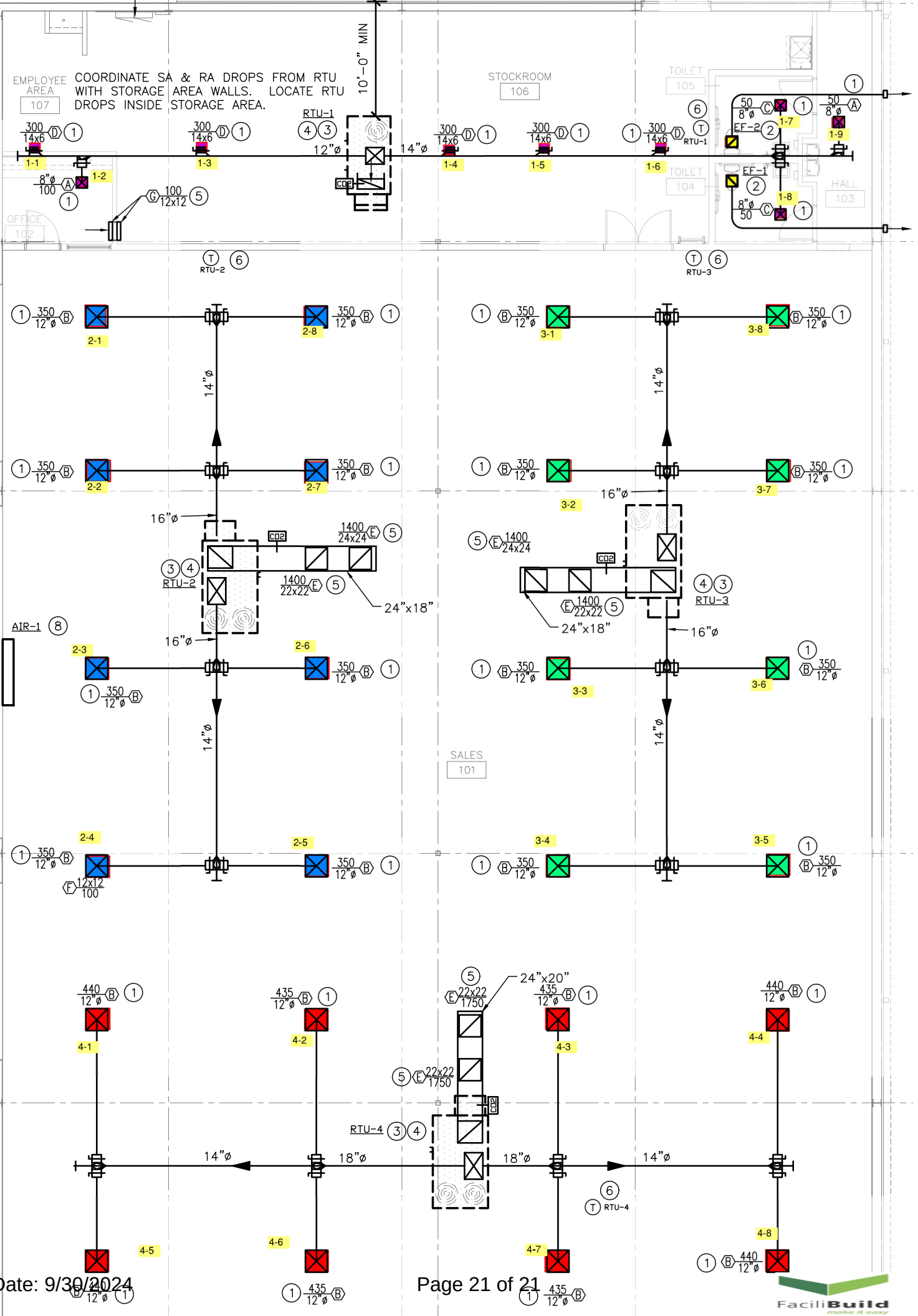
Completed By: Michael McDonnell on 09/30/2024


EMPLOYEE AREA 107
COORDINATE SA & RA DROPS FROM RTU WITH STORAGE AREA WALLS. LOCATE RTU DROPS INSIDE STORAGE AREA.
10'-0" MIN
STOCKROOM 106
TOILET 105
TOILET 104
HALL 103
OFFICE 102
SALES 101
RTU-1
RTU-2
RTU-3
RTU-4
EF-1
EF-2
AIR-1
24"x18"
24"x20"
14"ø
16"ø
18"ø