

Report By:

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SUITE 4210
CINCINNATI, OH 45246



Report: TAB REPORT
Function: Test, Adjust, & Balance
Date: 08/23/2023

PROJECT
08-07-23 WALGREENS #4721 - PUEBLO, CO
2900 W NORTHERN AVE
PUEBLO, CO 81005

Client

Walgreens
200 WILMOT RD
DEERFIELD, IL 60015

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

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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.

Commissioning Activities

Equipment was inspected to ensure that the installation meets Walgreens requirements. Control and equipment setpoints were checked and after balancing was completed performance of each unit was verified. The full list of items that were verified along with any that failed are contained in the checklists in this report.

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 per Walgreens standards. Each outlet was then adjusted to within tolerance. 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. 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.

Issue List

- EF-2 Cross Ducted w/ Supply Duct
- EF-5 Removed from plans per MC
- RTU-6 SUPPLY EXCEEDS DESGN AFTER PULLEY CHANGE



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Project Issue Information

Issue Name : EF-2 Cross Ducted w/ Supply Duct
Description : Fan was reading slightly positive. Removed flex and observed that fan was exhausting into supply duct and being effectively neutralized. Contacted MC and was informed they would have someone on it in the coming days.
Created By : National TAB **Assigned To :** National TAB - Brianna Biggs
Status : Open
Originated Date : 08/09/2023 - Jordan Best - National TAB



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Project Issue Information

Issue Name : EF-5 Removed from plans per MC
Description : Contacted MC about status of EF-5 and was informed the decision was made to remove it from the plans.
Created By : National TAB **Assigned To :** National TAB - Brianna Biggs
Status : Closed
Originated Date : 08/09/2023 - Jordan Best - National TAB



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Project Issue Information

Issue Name : RTU-6 SUPPLY EXCEEDS DESGN AFTER PULLEY CHANGE
Description : RTU-6 STILL ABOVE DESIGN CFM AFTER CHANGING FAN PULLEY TO REDUCE CFM SAW A DROP FROM 4,006 TO 2423 BUT COULD NOT BRING DOWN FURTHER. DUCT IS A STRAIGHT DROP FROM UNIT INTO THE SPACE THAT DOES NOT RESTRICT FLOW AT ALL, I USPECT THIS IS THE REASON FOR THE EXCESSIVE CFM. BY MY ESTIMATIONS SPACE IS LARGE ENOUGH TO ACCOMODATE THE EXTRA CFM
Created By : National TAB **Assigned To :** National TAB - Brianna Biggs
Status : Open
Originated Date : 08/10/2023 - Jordan Best - 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	SALES	2975	2868	2422	2148	553	720	18.6%	25.1%						
RTU-2	SALES/OFFICE	2975	2927	2422	2242	553	685	18.6%	23.4%						
RTU-3	SALES	1750	1593	1650	1593	100	0	5.7%	0.0%						
RTU-4	SALES/BREAK	1750	1582	1650	1582	100	0	5.7%	0.0%						
RTU-5	PHARMACY	1400	1482	1400	1482	0	0	0.0%	0.0%						
RTU-6	RECEIVING	1400	2423	1300	2423	100	0	7.1%	0.0%						
EF-1	OFFICE													300	213
EF-2	EMPLOYEE RR													300	262
EF-3	MENS RR													250	242
EF-4	WOMENS RR													250	255
EF-5	PHOTO														
TOTALS		12250	12875	10844	11470	1406	1405			0	0	0	0	1100	972

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	1406	1405
TOTAL EXHAUST	1100	972
NET AIRFLOW	306	433

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H2O)
FRONT	0.013
SIDE	0.015
REAR	0.012
AVERAGE	0.0133

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:

UNABLE TO LOWER OA FRO RTU 1 & 2 TO DESIGN, WAS ABLE TO SATISFY OA REQUIREMENTS WITH THESE TWO UNITS ALONE SO I REDUCED OA FOR THE OTHER UNS TO 0.

CheckList List

- TECH - 01 RTU INSTALLATION CHECKLIST
- TECH - 02 EXHAUST FANS INSPECTIONS
- TECH - 03 START-UP CONTROLS PROGRAMMING
- TECH - 04 EMS/SENSOR VALIDATION
- TECH - 05 TAB CHECKLIST
- TECH - 06 FUNCTIONAL TESTS
- TECH - 07 TEMPERATURE SETPOINTS
- TECH - 08 ENTRANCE HEATERS
- TECH - SITE PICTURES



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CheckList Information

Name : TECH - 01 RTU INSTALLATION CHECKLIST **Status :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 08/03/2023 - Brianna Biggs - National TAB

Completed Date : 08/11/2023 - Jordan Best - National TAB

CheckList Item Details

General / Exterior Inspections

Verify all required equipment has been replaced per TA and BOM. Pass

Comment:

All units are installed in the proper locations Pass

Comment:

Units are labeled correctly Pass

Comment:

Asset tag installed Pass

Comment:

Roof is clear of debris. Pass

Comment:

Maintenance access for all unit access panels is acceptable and panels open freely. Pass

Comment:

Cabinet and general installation is complete.

Pass

Comment:

Unit is secure to curb and level horizontally and vertically.

Pass

Comment:

Access doors close tightly with no leaks

Pass

Comment:

Condensate and gas piping is properly supported.

Pass

Comment:

Costguard is installed per scope of work and piping unions are cemented.

Pass

Comment:

Additional Comments

Comment:

Interior Inspections

Fan rotation is correct

Pass

Comment:

Pulleys are correctly aligned and both motor and fan sheave pins are tightened in place.

Pass

Comment:

Return air and outside air dampers close tightly with no gaps

Pass

Comment:

Cabinet and coils are not damaged and in like new condition.

Pass

Comment:

Inside of unit is clean and clear of debris.

Pass

Comment:

Validate condensate is piped to splash block, draing, or roof drain per code requirements

Pass

Comment:

Verify filters are installed, clean and of proper size. Verify there is no air by-pass around filters.

Pass

Comment:

Curb is sealed with no air leakage.

Pass

Comment:

Additional Comments:

Comment:

Fire/Smoke Alarm Systems

In duct smoke detectors are installed

Pass

Comment:

Fire alarm panel status (visual inspection where possible)

Comment:



IMG_1306
08/11/2023

Additional Comments:

Comment:

Electrical

Electrical wiring is complete with no visible damage

Pass

Comment:

Electrical connections are tight with sealtight around any unit penetrations.

Pass

Comment:

Disconnect switch is installed in accessible location near or on unit.

Pass

Comment:

Verify overcurrent protection is HACR type, installed and sized correctly and labeled in panel.

Pass

Comment:

Maintenance electrical outlet is installed and functional.

Pass

Comment:

Main distribution panel is labeled correctly.

Pass

Comment:

Unit ground wire is secured.

Pass

Comment:

Additional Comments:

Comment:



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CheckList Information

Name : TECH - 02 EXHAUST FANS INSPECTIONS **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 08/03/2023 - Brianna Biggs - National TAB

CheckList Item Details

Fan rotation is correct Pass

Comment:

Pulleys are aligned and belts are tensioned properly

Comment:

NA

Speed controller installed and functional (direct drive)

Comment:

NA

Fan is secured to the curb

Comment:

Back draft damper is installed and functional Pass

Comment:

No exterior damage to the fan Pass

Comment:

No unusual noise or vibration Pass

Comment:

Controls are functional

N/A

Comment:

Additional Comments:

Comment:

Fans are not equipped with speed controller so they are either on or off. EF-2 was cross ducted into a supply duct. Notified GC,



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CheckList Information

Name : TECH - 03 START-UP CONTROLS PROGRAMMING **Status :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 08/03/2023 - Brianna Biggs - National TAB

Completed Date : 08/10/2023 - Jordan Best - National TAB

CheckList Item Details

Programming: SE 3.3, 3.4, 4.0

Controller-Network-Address: RTU number + 3 Pass

Comment:

Controller-Network-FCBusMode = Wired Field Bus Pass

Comment:

Controller-Network-BaudRate = Auto Pass

Comment:

Controller-Network-Device ID = RTU number + 3 Pass

Comment:

Details-Occ-OffDurUnocc = No Pass

Comment:

Details-Clg-Setup-Clg-En = Yes Pass

Comment:

Details-Clg-Setup-ClgAdapTunEn = Yes

Pass

Comment:

Details-Htg-Setup-Htg-En = Yes

Pass

Comment:

Details-Htg-Setup-#HtgStgs = 2 Stages

Pass

Comment:

Details-Htg-Setup-HtgAdapTunEn = Yes

Pass

Comment:

Details-Htg-Setup-#GasVlvs = 1 (Set to 0 for Hp and Elect Heat)

Pass

Comment:

Details-Fan-Setup-Fan Ctl-Type = No VFD select "Single Speed", W/VFD select "Fixed Variable"

Pass

Comment:

Details-Fan-Setup-FanOnOcc = Yes

Pass

Comment:

Details-Fan-Setup-FanOnDlyHeat = 30s (Set to 0 for HP or Electric Heat)

Pass

Comment:

Details-Fan-Setup-FanOnly-%Cmd = 50%

Pass

Comment:

Details-Fan-Setup-1ClgStg-%Cmd = 70%

Pass

Comment:

Details-Fan-Setup-2Clgstg-%Cmd = 100% (2stage Unit) or 80% (3 and 4 stage)

Pass

Comment:

Details-Fan-Setup-3ClStg-%Cmd = 100% (3 stage unit) or 90% (4 stage)

Pass

Comment:

Details-Fan-Setup-4ClStg-%Cmd = 100% (4 Stage unit)

Pass

Comment:

Details-Fan-Setup-1HtgStg-%Cmd = 100%

Pass

Comment:

Details-Fan-Setup-2HtgStg-%Cmd = 100%

Pass

Comment:

Details-Econ-Setup-Econ-En = Yes

Pass

Comment:

Details-Econ-Setup-Econ-MinPos = Set to minimum outside air requirements.

Pass

Comment:

Details-Econ-Setup-LowSpdFan-MinPos = Set minimum 1% above EconMinPos

Pass

Comment:

Details-Econ-Setup-FreeClg-Sel = Single Enthalpy

Pass

Comment:

Details-Econ-Setup-EconOAEnth-Sp 4= 24 Btu/lb

Pass

Comment:

Details-Econ-Setup-Dvent-Mode = Enable

Pass

Comment:

Details-Econ-Setup-DventMaxEconPos = 50%

Pass

Comment:

Details-Econ-Setup-DventIAP-Sp = 1000

Pass

Comment:

Details-Econ-Setup-EconFltDetectEn = Enable

Pass

Comment:

Additional Comments:

Comment:

Non ZR Units only:

Details-HGR-Setup-HGR-En = No

Pass

Comment:

Details-HGR-Setup-HGRAlt-En = No

Pass

Comment:

Details - HGR-Setup-HGRUnocc-En = No

Pass

Comment:

Details-HGR-Setup-Mode = No

Pass

Comment:

Additional Comments:

Comment:

ZR Units - Reheat Units only:

Details-HGR-Setup-HGR-En = Yes

Pass

Comment:

Details-HGR-Setup-HGRAlt-En = Yes

Pass

Comment:

Details - HGR-Setup-HGRUnocc-En = Yes

Pass

Comment:

Details-HGR-Setup-Mode = No

Pass

Comment:

Additional Comments:

Comment:



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CheckList Information

Name : TECH - 04 EMS/SENSOR VALIDATION **Status :** Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 08/03/2023 - Brianna Biggs - National TAB
Completed Date : 08/10/2023 - Jordan Best - National TAB

CheckList Item Details

RTU supply air temp sensor location located per start-up binder. N/A

Comment:

NO START UP BINDER

RTU return air temp sensor location located per start-up binder. N/A

Comment:

NO START UP BINDER

RTU return air smoke detector (when applicable) is located per start-up binder. N/A

Comment:

NO START UP BINDER

Space temperature sensor has been replaced and location meets requirements. Pass

Comment:

Space humidity sensor has been replaced and location meets requirements. N/A

Comment:

Unit is being controlled by a space temperature sensor or thermostat Pass

Comment:

EMS has been connected and validated with TOC or Gridpoint. Screen shot is available.

Pass

Comment:

No splicing of EMS/Sensor/Thermostat wiring is visible

Pass

Comment:

(If Applicable) 2 Stage Thermostat to SE Board Control Wiring meets detail in start-up binder.

Comment:

NA

(If Applicable) 2 Stage Thermostat to 4 Stage Unit meets detail in start-up binder.

Comment:

NA

(If Applicable) 4 Stage Thermostat to 4 Stage Unit meets detail in start-up binder.

Comment:

NA

(If Applicable) 3 Stage Thermostat wiring meets detail in start-up binder.

Comment:

NA

(If Applicable) 3 Stage Thermostat with Humidity sensor wiring meets detail in start-up binder.

Comment:

NA

(If Applicable) EH Thermostat with SCR control wiring meets detail in start-up binder.

Comment:

NA

Temperature setpoints are set for correction region and space (see ASHRAE / temperature setpoint chart in procedure)

Fail

Comment:

CALLED GRID POINT TO VERIFY SET-POINTS BUT THEY WOULD NOT CHANGE THEM TO MATCH WHAT IS ON MY CHART. ALL SET POINTS WERE WITHIN 1 TO 2 DEGRESS OF WHAT THE CHART CALLS FOR

Additional Comments:

Comment:



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CheckList Information

Name : TECH - 05 TAB CHECKLIST **Status :** Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 08/03/2023 - Brianna Biggs - National TAB
Completed Date : 08/10/2023 - Jordan Best - National TAB

CheckList Item Details

Outside air damper set to minimum air flow requirement and damper position marked. Pass

Comment:

Total Supply, return, and outside air volumes meet design tolerances (+/-10%) Pass

Comment:

Enclosed area diffusers (Pharmacies, manager office, employee room, restrooms, electrical rooms) balanced within +/-10%? Pass

Comment:

Open area diffusers (Sales floor and stock room) balanced within +/-25% of design? Pass

Comment:

Store pressure meets tolerances (see formula in balance schedule). Make sure to account for existing exhaust fans airflows as shown on original drawings that are non-functioning. Pass

Comment:

Outside air and return air dampers modulate freely. Pass

Comment:

Start-up report from the installing contractor is reviewed and all information if filled out. All required measurements are within typical ranges.

N/A

Comment:

Did not receive startup report from office nor GC.

(If Applicable) VFD is set-up and operational. (N/A = not applicable)

Comment:

YES

Verify amp draw of motor is within unit specification, not operating in overamped condition.

Pass

Comment:

Sales floor temperature and humidity measurement

Comment:

75.5 / 26.9%

Pharmacy temperature and humidity measurement

Comment:

73.7 / 27%

Stock Room temperature and humidity measurement

Comment:

76 / 26%

Outdoor air temperature and humidity measurement

Comment:

96 / 15%

Additional Comments:

Comment:



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CheckList Information

Name : TECH - 06 FUNCTIONAL TESTS **Status :** Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 08/03/2023 - Brianna Biggs - National TAB
Completed Date : 08/10/2023 - Jordan Best - National TAB

CheckList Item Details

Cooling Functional Test

Overwrite the thermostat or sensor to put the unit into cooling mode. Pass

Comment:

Compressors enable. Pass

Comment:

If fan has VFD, the fan increases speed. Pass

Comment:

Document the discharge air temperature.

Comment:

NA

After 10 minutes, Discharge air temperature is below 55 degrees. Pass

Comment:

Cooling mode is operational Pass

Comment:

Additional Comments:

Comment:

Heating Functional Test

Overwrite the thermostat or sensor to put the unit into heating mode. Pass

Comment:

Heat exchanger enables. Pass

Comment:

If fan has VFD, the fan increases speed. Pass

Comment:

Document the discharge air temperature.

Comment:

NA, OUTSIDE AIR INTERFERED WITH MY MEASUREMENT MAKING IT UNRELIABLE

After 10 minutes, Discharge air temperature is above 85 degrees. Pass

Comment:

Heating mode is operational Pass

Comment:

Additional Comments

Comment:

Dehumidification Functional Test

Overwrite the humidistat to put the unit into dehumidification mode. Pass

Comment:

Compressors enable. Pass

Comment:

Hot Gas Reheat Valve opens

Pass

Comment:

If fan has VFD, the fan increases speed.

Pass

Comment:

Document the discharge air temperature.

Comment:

NA, OUTSIDE AIR INTERFERED WITH MY MEASUREMENT MAKING IT UNRELIABLE.

Dehumidification Mode is operational. (Pass/Fail/NA)

Comment:

Additional Comments:

Comment:

Economizer Functional Test

Overwrite the humidistat to put the unit into economizer mode.

Pass

Comment:

Economizer modulates from minimum position to 100% open. (Pass/Fail/NA)

Comment:

PASS

Additional Comments:

Comment:



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CheckList Information

Name : TECH - 07 TEMPERATURE SETPOINTS **Status :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 08/03/2023 - Brianna Biggs - National TAB

Completed Date : 08/10/2023 - Jordan Best - National TAB

CheckList Item Details

Temperature setpoints must be set using provided charts are based on state and space that each RTU serves. Confirm with controls company that these are set correctly Fail

Comment:

REACHED OUT TO GRID POINT TO CONFIRM TEMP SET POINTS. WHEN I ASKED THEM TO MAKE CHANGES THEY TOLD ME I WAS NOT AUTHORIZED TO DO SO AND THE WALGREENS ENGINEERING/CONSTRUCTION TEAM WOULD HAVE TO INITIATE A TICKET TO DO SO. TEMP SET POINTS CLOSELY REFLECTED CHART, BUT SOME WERE 1 TO 2 DEGREES OFF.



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CheckList Information

Name : TECH - 08 ENTRANCE HEATERS **Status :** Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 08/03/2023 - Brianna Biggs - National TAB
Completed Date : 08/10/2023 - Jordan Best - National TAB

CheckList Item Details

Sensor is located within 15' of entrance area Pass

Comment:

Confirm proper operation of entrance heater and associated controls Pass

Comment:

Balance supply air quantity to manufacturer recommended supply airflow. Pass

Comment:

Confirm listed temperature rise and discharge air temperature based on approved BOM/submittal N/A

Comment:

HEATERS NOT PROVIDED IN SUBMITTAL I HAVE ACCESS TO



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CheckList Information

Name : TECH - SITE PICTURES **Status :** Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 08/03/2023 - Brianna Biggs - National TAB
Completed Date : 08/11/2023 - Jordan Best - National TAB

CheckList Item Details

STORE FRONT Yes

Comment:



IMG_1310
08/11/2023

RTU-1 Yes

Comment:



IMG_1269
08/09/2023

RTU-2

Yes

Comment:

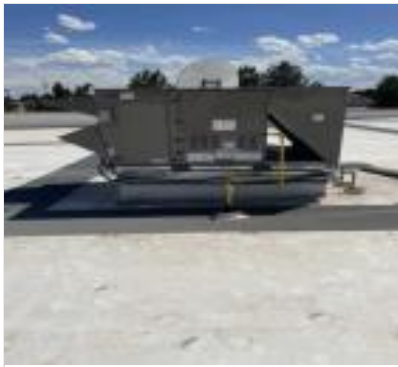


IMG_1270
08/09/2023

RTU-3

Yes

Comment:



IMG_1271
08/09/2023

RTU-4

Yes

Comment:



IMG_1272
08/09/2023

RTU-5

Yes

Comment:



IMG_1273
08/09/2023

RTU-6

Yes

Comment:



IMG_1274
08/09/2023

EF-1

Comment:

EF-2

Comment:

EF-3

Comment:

EF-4

Comment:

EF-5

Comment:

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System/Unit: AHU/RTU



Asset: RTU1

AREA:SALES

Unit Data			Test Data		
	Design	Actual		Design	Actual
MFG	YORK	YORK	SF CFM	2975	2868
Serial Num	-	N2K2935428	SF RPM	1089	984
Model Num	ZT102N18R4B5GCE2R1	ZT102N18R4B5GCE2R1	RA CFM	2422	2148
Type	RTU	RTU	OA CFM	553	720
Configuration	HORIZONTAL	HORIZONTAL	RL Voltage	-	494
Num OA Filters 1	-	1	RL Amperage	-	3.1
OA Filter Size 1	-	30" X 22"	SF Rotation	-	CW
Num Final Filter 1	-	4	RA Damper Position	-	80%
Final Filter Size 1	-	20" X 24" X 2"	Min OA Damper Position	-	20%
			Min OA Damper Type	-	ECON
			OA Enthalpy Setpt	-	NA

Motor Data		
	Design	Actual
Motor MFG	-	BALDOR
Frame	-	56HZ
Horsepower	3	3
Motor Rpm	-	1750
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	8.3

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.32"
Fan Suction SP	-	-0.72"
Fan Discharge SP	-	0.59"
Total ESP	1.2	1.63"
Fan Total SP	-	1.31"

Drive Data		
	Design	Actual
Motor Sheave Size	-	4.5"
Motor Bore Size	-	0.875"
Motor Sheave SetPt	-	4 TURNS OUT
Fan Sheave Size	-	7"
Fan Sheave Bore	-	1"
Belt CL Distance	-	19.5"
Num of Belts	-	1
Belt Size	-	A54
Belt Alignment	-	GOOD

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

National TAB

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AHU/RTU



Diffuser Supply (GRD)

RTU1/SALES

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	CHECK OUT		12X6	265	1	193	286	286	107.9
SGRD2	CHECK OUT		12X12	475	1	521	410	410	86.3
SGRD3	COSMETICS		12X12	475	1	409	392	392	82.5
SGRD4	COSMETICS		12X12	475	1	382	421	421	88.6
SGRD5	CHECK OUTS		12X12	475	1	412	437	437	92.0
SGRD6	SALES		12X6	270	1	310	294	294	108.9
SGRD7	SALES		12X6	270	1	219	301	301	111.5
SGRD8	SALES		12X6	270	1	403	327	327	121.1
Total				2975		2849	2868	2868	96.4%

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU



Asset: RTU2

AREA:SALES/ OFFICES

Unit Data			Test Data		
	Design	Actual		Design	Actual
MFG	YORK	YORK	SF CFM	2975	2927
Serial Num	-	N2F2609560	SF RPM	1055	897
Model Num	ZT102N18R4B5GCA2R1	ZT102N18R4B5GCA2R1	RA CFM	2422	2242
Type	RTU	RTU	OA CFM	553	685
Configuration	VERTICAL	VERTICAL	RL Voltage	-	495
Num OA Filters 1	-	1	RL Amperage	-	3.8
OA Filter Size 1	-	30" X 22"	SF Rotation	-	CW
Num Final Filter 1	-	4	RA Damper Position	-	80%
Final Filter Size 1	-	20" X 24" X 2"	Min OA Damper Position	-	20%
			Min OA Damper Type	-	ECON

Motor Data		
	Design	Actual
Motor MFG	-	BALDOR
Frame	-	56HZ
Horsepower	3	3
Motor Rpm	-	1750
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	8.3

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.53"
Fan Suction SP	-	-0.73"
Fan Discharge SP	-	0.45"
Total ESP	1.2"	1.71"
Fan Total SP	-	1.18"

Drive Data		
	Design	Actual
Motor Sheave Size	-	4.5"
Motor Bore Size	-	0.875"
Motor Sheave SetPt	-	5 TURNS OUT
Fan Sheave Size	-	7"
Fan Sheave Bore	-	1"
Belt CL Distance	-	19.5"
Num of Belts	-	1
Belt Size	-	A54
Belt Alignment	-	GOOD

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

Completed By: Jordan Best on 08/10/2023

National TAB

Project:08-07-23 WALGREENS #4721 - PUEBLO, CO

AHU/RTU



Diffuser Supply (GRD)

RTU2/SALES/ OFFICES

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	SALES		12X6	270	1	372	209	209	77.4
SGRD2	SALES		12X6	270	1	283	215	215	79.6
SGRD3	PHOTO		18X18	350	1	291	287	287	82.0
SGRD4	PASSAGE 2		9X9	335	1	395	402	402	120.0
SGRD5	OFFICE		12"	350	1	503	372	372	106.3
SGRD6	SALES		15X15	350	1	621	299	299	85.4
SGRD7	SALES		12X12	350	1	293	381	381	108.9
SGRD8	SALES		12X12	350	1	403	372	372	106.3
SGRD9	SALES		12X12	350	1	256	392	392	112.0
Total				2975		3417	2929	2929	98.45%

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU



Asset: RTU3

AREA:SALES

Unit Data			Test Data		
	Design	Actual		Design	Actual
MFG	YORK	YORK	SF CFM	1750	1597
Serial Num	-	N2K2935596	SF RPM	1051	680
Model Num	ZJ061N12D4B5GCB2R3	ZJ061N12D4B5GCB2R3	RA CFM	1650	1597
Type	RTU	RTU	OA CFM	100	0
Configuration	HORIZONTAL	HORIZONTAL	RL Voltage	-	500
Num OA Filters 1	-	1	RL Amperage	-	3.4
OA Filter Size 1	-	30" X 22"	SF Rotation	-	CW
Num Final Filter 1	-	4	RA Damper Position	-	100%
Final Filter Size 1	-	20" X 24" X 2"	Min OA Damper Position	-	0%
			Min OA Damper Type	-	ECON

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON
Frame	-	56HZ
Horsepower	2	2
Motor Rpm	-	1725
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	6.6

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.17"
Fan Suction SP	-	-0.26"
Fan Discharge SP	-	0.28"
Total ESP	1.3"	0.71"
Fan Total SP	-	0.54"

Drive Data		
	Design	Actual
Motor Sheave Size	-	3.15"
Motor Bore Size	-	.0875"
Motor Sheave SetPt	-	2 TURNS OUT
Fan Sheave Size	-	7"
Fan Sheave Bore	-	.0875"
Belt CL Distance	-	17.5"
Num of Belts	-	1
Belt Size	-	A48
Belt Alignment	-	GOOD

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

Completed By: Jordan Best on 08/10/2023

National TAB

Project:08-07-23 WALGREENS #4721 - PUEBLO, CO

AHU/RTU



Diffuser Supply (GRD)

RTU3/SALES

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	SALES		12X12	440	1	573	490	342	77.7
SGRD2	SALES		12X12	435	1	693	528	438	100.7
SGRD3	SALES		12X12	440	1	572	309	415	94.3
SGRD4	SALES		12X12	435	1	705	273	398	91.5
Total				1750		2543	1600	1593	91.03%

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU



Asset: RTU4

AREA:SALES/BREAK ROOM

Unit Data			Test Data		
	Design	Actual		Design	Actual
MFG	YORK	YORK	\$F CFM	1750	1582
Serial Num	-	N2K2935595	\$F RPM	1051	800
Model Num	ZJ061N12D4B5GCB2R3	ZJ061N12D4B5GCB2R3	RA CFM	1650	1582
Type	RTU	RTU	OA CFM	100	0
Configuration	VERTICAL	VERTICAL	RL Voltage	-	498
Num OA Filters 1	-	1	RL Amperage	-	3.5
OA Filter Size 1	-	30" X 22"	\$F Rotation	-	CCW
Num Final Filter 1	-	4	RA Damper Position	-	100%
Final Filter Size 1	-	20" X 24" X 2"	Min OA Damper Position	-	0%
			Min OA Damper Type	-	ECON

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON
Frame	-	56HZ
Horsepower	2	2
Motor Rpm	-	1725
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	6.6

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.22"
Fan Suction SP	-	-0.36"
Fan Discharge SP	-	0.32"
Total ESP	1.3"	0'9
Fan Total SP	-	0.68"

Drive Data		
	Design	Actual
Motor Sheave Size	-	3.15"
Motor Bore Size	-	.0875"
Motor Sheave SetPt	-	.5 TURNS OUT
Fan Sheave Size	-	7"
Fan Sheave Bore	-	.0875"
Belt CL Distance	-	18.5"
Num of Belts	-	1
Belt Size	-	A48
Belt Alignment	-	GOOD

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

Completed By: Jordan Best on 08/10/2023

National TAB

Project:08-07-23 WALGREENS #4721 - PUEBLO, CO

AHU/RTU



Diffuser Supply (GRD)

RTU4/SALES/BREAK ROOM

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	SALES		12x12	395	1	621	309	309	78.2
SGRD2	SALES		12x12	395	1	582	341	341	86.3
SGRD3	EMPLOYEE ROOM		12x12	170	1	215	157	157	92.4
SGRD4	SALES		12x12	395	1	612	373	373	94.4
SGRD5	SALES		12x12	395	1	388	402	402	101.8
Total				1750		2418	1582	1582	90.4%

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU



Asset: RTU5

AREA:PHARMACY

Unit Data			Test Data		
	Design	Actual		Design	Actual
MFG	YORK	YORK	SF CFM	1400	1482
Serial Num	-	N2H2934789	SF RPM	995	753
Model Num	ZJ049N12D4B5BCB2R2	ZJ049N12D4B5BCB2R2	RA CFM	1400	1482
Type	RTU	RTU	OA CFM	0	0
Configuration	VERTICAL	VERTICAL	RL Voltage	-	500
Num OA Filters 1	-	1	RL Amperage	-	2.16
OA Filter Size 1	-	30" X 22"	SF Rotation	-	CW
Num Final Filter 1	-	4	RA Damper Position	-	100%
Final Filter Size 1	-	20" X 24" X 2"	Min OA Damper Position	-	0%
			Min OA Damper Type	-	ECON

Motor Data		
	Design	Actual
Motor MFG	-	CENTURY
Frame	-	56HZ
Horsepower	1.50	1.5
Motor Rpm	-	1725
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	5

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.23"
Fan Suction SP	-	-0.33"
Fan Discharge SP	-	0.20"
Total ESP	1.2"	0.76"
Fan Total SP	-	0.53"

Drive Data		
	Design	Actual
Motor Sheave Size	-	4"
Motor Bore Size	-	.0875"
Motor Sheave SetPt	-	4 TURNS OUT
Fan Sheave Size	-	8.25
Fan Sheave Bore	-	1"
Belt CL Distance	-	17"
Num of Belts	-	1
Belt Size	-	A50
Belt Alignment	-	GOOD

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

Completed By: Jordan Best on 08/10/2023

National TAB

Project:08-07-23 WALGREENS #4721 - PUEBLO, CO

AHU/RTU



Diffuser Supply (GRD)

RTU5/PHARMACY

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	PHARMACY		12X12	350	1	617	370	370	105.7
SGRD2	PHARMACY		12X12	350	1	573	372	372	106.3
SGRD3	PHARMACY		12x12	350	1	493	367	367	104.9
SGRD4	PHARMACY		12X12	350	1	494	373	373	106.6
Total				1400		2177	1482	1482	105.86%

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: AHU/RTU



Asset: RTU6

AREA:RECEIVING

Unit Data			Test Data		
	Design	Actual		Design	Actual
MFG	YORK	YORK	SF CFM	1400	2423
Serial Num	-	N2H2934799	SF RPM	995	674
Model Num	ZJ049N12D4B5BCB2R2	ZJ049N12D4B5BCB2R2	RA CFM	1300	2423
Type	RTU	RTU	OA CFM	100	0
Configuration	VERTICAL	VERTICAL	RL Voltage	-	495
Num OA Filters 1	-	1	RL Amperage	-	2.09
OA Filter Size 1	-	30" X 22"	SF Rotation	-	CW
Num Final Filter 1	-	4	RA Damper Position	-	100%
Final Filter Size 1	-	20" X 24" X 2"	Min OA Damper Position	-	0%
			Min OA Damper Type	-	ECON

Motor Data		
	Design	Actual
Motor MFG	-	CENTURY
Frame	-	56HZ
Horsepower	1.50	1.5
Motor Rpm	-	1725
Phase	3	3
Rated Voltage	460	460
Rated Amperage	-	5

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.19"
Fan Suction SP	-	-0.31"
Fan Discharge SP	-	0.20"
Total ESP	1.2"	0.70"
Fan Total SP	-	0.51"

Drive Data		
	Design	Actual
Motor Sheave Size	-	4"
Motor Bore Size	-	.0875"
Motor Sheave SetPt	-	5 TURNS OUT
Fan Sheave Size	-	8.25"
Fan Sheave Bore	-	1"
Belt CL Distance	-	17.5"
Num of Belts	-	1
Belt Size	-	A50
Belt Alignment	-	GOOD

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

Completed By: Jordan Best on 08/10/2023

Notes:

UNIT ABOVE DESIGN CFM DESPITE PULLEY CHANGE, SUSPECT IT IS DUE TO DIRECT DROP STRAIGHT INTO SPACE WITH NO RESTRICTON FROM DUCT WORK.

Written By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust



Asset: EF1

AREA:OFFICE

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	SP-250	SP-250
Serial Num	-	NA
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	121W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	Actual
CFM	300	213
Fan RPM	890	NA
Fan Rotation	-	CW
Motor RPM	-	NA
System SetPt	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.375"	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	NA

Completed By: Jordan Best on 08/10/2023

Notes:
FAN IS NOT EQUIPPED WITH SPEED CONTROLLER THEREFORE COULD NOT BE SPED UP

Written By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust



Asset: EF2

AREA:EMPLOYEE ROOM

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	SP-250	SP-250
Serial Num	-	NA
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	121W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	Actual
CFM	300	262
Fan RPM	890	NA
Fan Rotation	-	CW
Motor RPM	-	NA
System SetPt	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.375"	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	NA

Completed By: Jordan Best on 08/10/2023

Notes:

FAN MISTAKENLY CONNECTED TI SUPPLY DUCT, DISCONNECTED TO ACQUIRE READING. MC IS TO CONNECT FAN TO PROPER DUCT

Written By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust



Asset: EF3

AREA:MENS RR

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	SP-226	SP-226
Serial Num	-	NA
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	87W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	Actual
CFM	250	242
Fan RPM	1000	NA
Fan Rotation	-	CW
Motor RPM	-	NA
System SetPt	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.25"	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	NA

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust



Asset: EF4

AREA:WOMENS RR

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	SP-226	SP-226
Serial Num	-	NA
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	81W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	Actual
CFM	250	255
Fan RPM	1000	NA
Fan Rotation	-	CW
Motor RPM	-	NA
System SetPt	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	0.25"	NA
Fan Inlet SP	-	NA
Fan Discharge SP	-	NA

Completed By: Jordan Best on 08/10/2023

National TAB

Project: 08-07-23 WALGREENS #4721 - PUEBLO, CO

System/Unit: FAN - Exhaust



Asset: EF5

AREA:PHOTO

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	CSP-260	CSP-260
Serial Num	-	NA
Type	UTILITY	NA
Configuration	VERTICAL	NA

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	385W	NA
Motor Rpm	-	NA
Phase	1	NA
Voltage (rated)	120	NA
Amperage (rated)	-	NA
Service Factor	-	NA

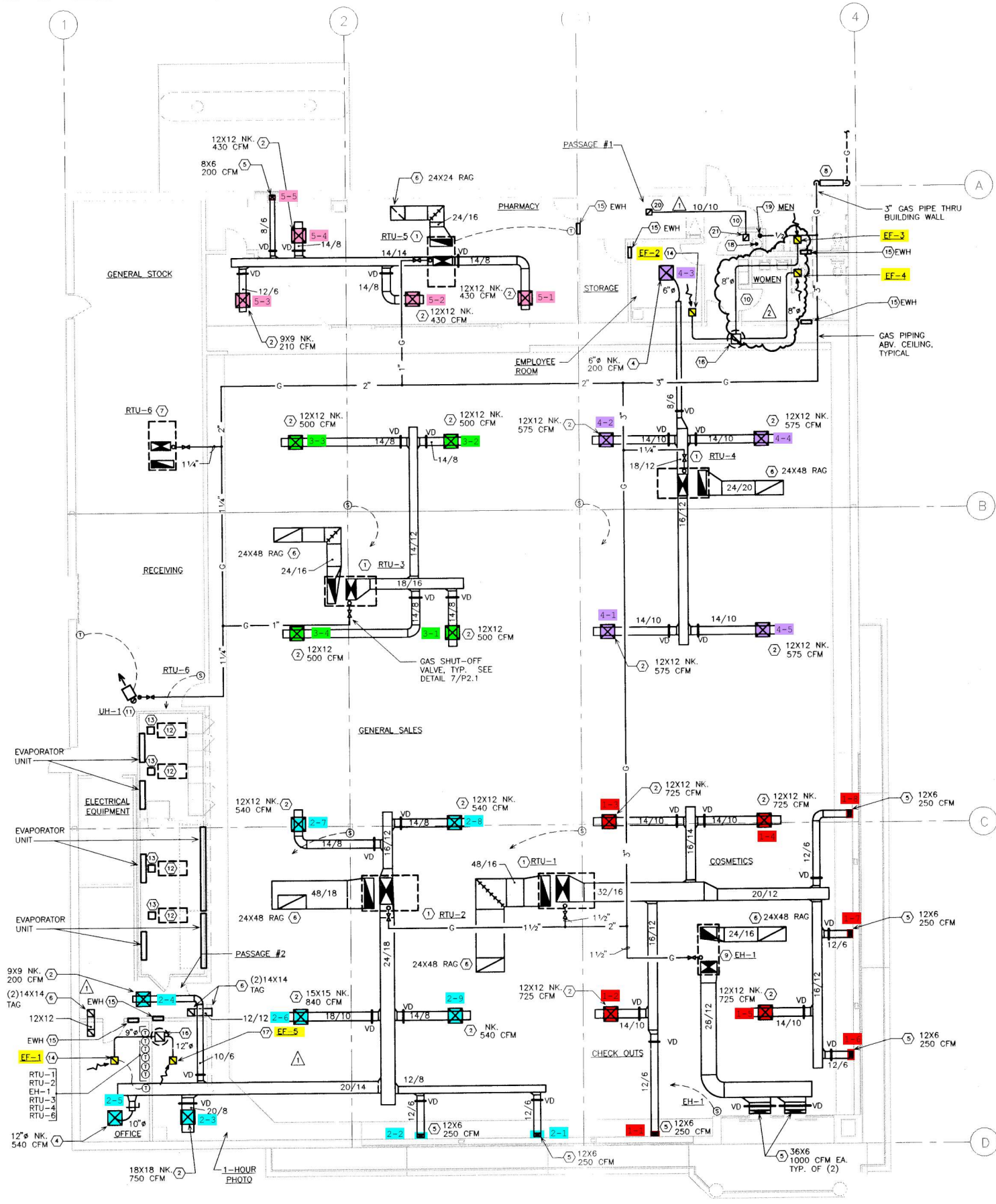
Drive Data		
	Design	Actual
Motor Sheave Size	-	NA
Motor Bore Size	-	NA
Motor Sheave SetPt	-	NA
Fan Sheave Size	-	NA
Fan Sheave Bore	-	NA
Belt CL Distance	-	NA
Num of Belts	-	NA
Belt Size	-	NA

Test Data		
	Design	Actual
CFM	750	NA
Fan RPM	928	NA
Fan Rotation	-	NA
Motor RPM	-	NA
RL Voltage	-	NA
RL Amperage	-	NA
Suction ESP	-	NA
Discharge ESP	-	NA
Total ESP	0.25"	NA

Completed By: Jordan Best on 08/10/2023

Notes:
FAN REMOVED FROM PLANS PER MC

Written By: Jordan Best on 08/10/2023



FLOOR PLAN - HVAC
 SCALE: 1/8" = 1'-0"