

Report By:

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

**NATIONAL**

**TAB**

Comfort. Under control.

**Report: TAB REPORT**  
**Function: Test, Adjust, & Balance**  
**Date: 05/09/2023**

# PROJECT

## Raymore Commerce Ctr (Raymore, MO)

1200 SOUTH DEAN AVE

RAYMORE, MO 64083

### Client

Metro Air Conditioning

8151 McCoy

Shawnee, KS 66227

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## Table Of Contents

<b>Section</b>	<b>Page #</b>
Certification Page	3
Issue Data	4
AHU/RTU	5
FAN - Exhaust	11
FAN - Supply	13
GRD Layout	17

## Issue List

- MUA Airflow



# CERTIFICATION



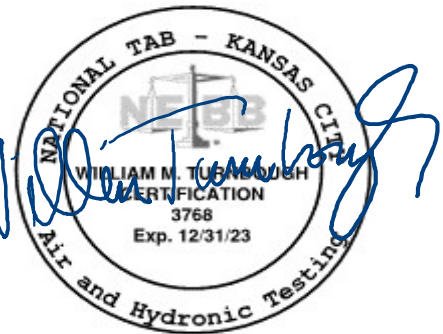
**PROJECT:** RAYMORE COMMERCE CENTER (RAYMORE, MO)

The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NEBB Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems. The measurements shown, and the information given, in this report are certified to be accurate and complete, at the time and date information was gathered. Any variances from design quantities, which exceed NEBB tolerances, are noted in the TAB report project summary.

**NEBB TAB FIRM:** National TAB - Kansas City  
**REGISTRATION NO:** 3768  
**CERTIFIED BY:** Will Turnbough  
**DATE:** 5/9/2023

## Submitted and Certified by:

**NEBB TAB FIRM:** National TAB - Kansas City  
**TAB PROFESSIONAL:** Will Turnbough  
**REGISTRATION NO:** CP-24289  
**CERTIFICATION EXP:** 12/31/2023





Comfort. Under control.

### Raymore Commerce Ctr (Raymore, MO)

#### Project Issue Information

**Issue Name :** MUA Airflow  
**Description :** Unable to reduce the MUA's to 8500 CFM of OA. When closing all dampers past ~9.5 Vdc, the units tripped off on a "Supply Air Proving Fault". Max pressure across burner per tag is 0.95" and measured pressure drop exceeded this upper limit. Set to lowest setpoint possible and measured OA as is.

**Created By :** National TAB                      **Assigned To :** National TAB - Will Turnbough

**Status :** Open

**Originated Date :** 05/09/2023 - Will Turnbough - National TAB

Project Issue Response Details

- **05/09/2023    National TAB - Will Turnbough**
  - Recommended consulting Rupp to determine next steps. Possibly the pulley could be changed to reduce airflow and therefore reducing the pressure drop across the burner.

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

System/Unit: AHU/RTU



Comfort. Under control.

Asset: MUA1

AREA:

Unit Data		
	Design	Actual
MFG	RUPP	RUPP
Serial Num	-	
Model Num	NA	NA
Type	-	
Configuration	-	
Num OA Filters 1	-	
OA Filter Size 1	-	
Num Final Filter 1	-	
Final Filter Size 1	-	
Num Final Filter 2	-	
Final Filter Size 2	-	

Motor Data		
	Design	Actual
Motor MFG	-	
Frame	-	
Horsepower	-	
Motor Rpm	-	
Phase	-	
Rated Voltage	-	
Rated Amperage	-	

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

Test Data		
	Design	Actual
SF CFM	37000	
SF RPM	-	
RA CFM	-	
OA CFM	8510	13561
RL Voltage	-	
RL Amperage	-	
SF Rotation	-	
RA Damper Position	-	
Min OA Damper Position	-	9.5VDC
Min OA Damper Type	-	

Performance Data		
	Design	Actual
MA Plenum SP	-	
Fan Suction SP	-	
Fan Discharge SP	-	
Total ESP	across burner	0.93"
Fan Total SP	-	

Completed By: Will Turnbough on

Notes: OA and Pressure across burner taken under windy conditions with 19mph wind gusts.

Date: 05/04/2023

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## System/Unit: AHU/RTU



Comfort. Under control.

Asset: MUA2

AREA:

Unit Data		
	Design	Actual
MFG	RUPP	RUPP
Serial Num	-	
Model Num	NA	NA
Type	-	
Configuration	-	
Num OA Filters 1	-	
OA Filter Size 1	-	
Num Final Filter 1	-	
Final Filter Size 1	-	
Num Final Filter 2	-	
Final Filter Size 2	-	

Test Data		
	Design	Actual
SF CFM	37000	
SF RPM	-	
RA CFM	-	
OA CFM	8510	12836
RL Voltage	-	
RL Amperage	-	
SF Rotation	-	
RA Damper Position	-	
Min OA Damper Position	-	9.0VDC
Min OA Damper Type	-	
OA Enthalpy Setpt	-	

Motor Data		
	Design	Actual
Motor MFG	-	
Frame	-	
Horsepower	-	
Motor Rpm	-	
Phase	-	
Rated Voltage	-	
Rated Amperage	-	

Performance Data		
	Design	Actual
MA Plenum SP	-	
Fan Suction SP	-	
Fan Discharge SP	-	
Total ESP	across burner	0.90"
Fan Total SP	-	

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

Completed By: Will Turnbough on

Notes: SUPPLY AIR PROVING FAULT AT 9.5VDC OA and Pressure across burner taken under windy conditions with 19mph wind gusts.

Date: 05/04/2023

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## System/Unit: AHU/RTU



Comfort. Under control.

Asset: MUA3

AREA:

Unit Data		
	Design	Actual
MFG	RUPP	RUPP
Serial Num	-	
Model Num	NA	NA
Type	-	
Configuration	-	
Num OA Filters 1	-	
OA Filter Size 1	-	
Num Final Filter 1	-	
Final Filter Size 1	-	
Num Final Filter 2	-	
Final Filter Size 2	-	

Test Data		
	Design	Actual
SF CFM	37000	
SF RPM	-	
RA CFM	-	
OA CFM	8510	13569
RL Voltage	-	
RL Amperage	-	
SF Rotation	-	
RA Damper Position	-	
Min OA Damper Position	-	9.5VDC
Min OA Damper Type	-	
OA Enthalpy Setpt	-	

Motor Data		
	Design	Actual
Motor MFG	-	
Frame	-	
Horsepower	-	
Motor Rpm	-	
Phase	-	
Rated Voltage	-	
Rated Amperage	-	

Performance Data		
	Design	Actual
MA Plenum SP	-	
Fan Suction SP	-	
Fan Discharge SP	-	
Total ESP	across burner	0.94"
Fan Total SP	-	

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

Completed By: Will Turnbough on

Notes: OA and Pressure across burner taken under windy conditions with 19mph wind gusts.

Date: 05/04/2023

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## System/Unit: AHU/RTU



Comfort. Under control.

Asset: MUA4

AREA:

Unit Data		
	Design	Actual
MFG	RUPP	RUPP
Serial Num	-	
Model Num	NA	NA
Type	-	
Configuration	-	
Num OA Filters 1	-	
OA Filter Size 1	-	
Num Final Filter 1	-	
Final Filter Size 1	-	
Num Final Filter 2	-	
Final Filter Size 2	-	

Test Data		
	Design	Actual
SF CFM	37000	
SF RPM	-	
RA CFM	-	
OA CFM	8510	13621
RL Voltage	-	
RL Amperage	-	
SF Rotation	-	
RA Damper Position	-	
Min OA Damper Position	-	9.5VDC
Min OA Damper Type	-	
OA Enthalpy Setpt	-	

Motor Data		
	Design	Actual
Motor MFG	-	
Frame	-	
Horsepower	-	
Motor Rpm	-	
Phase	-	
Rated Voltage	-	
Rated Amperage	-	

Performance Data		
	Design	Actual
MA Plenum SP	-	
Fan Suction SP	-	
Fan Discharge SP	-	
Total ESP	across burner	0.93"
Fan Total SP	-	

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

Completed By: Will Turnbough on

Notes: OA and Pressure across burner taken under windy conditions with 19mph wind gusts.

Date: 05/04/2023

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## System/Unit: AHU/RTU



Comfort. Under control.

Asset: RTU-1

AREA:OFFICE

Unit Data		
	Design	Actual
MFG	CARRIER	CARRIER
Serial Num	-	2622C05880
Model Num	48FCEA05A2A6	48FCEA05A2A6A0A0A0
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1 METAL MESH
OA Filter Size 1	-	14.25X28.25
Num PreFilter 1	-	2
PreFilter Size 1	-	16x25x2

Test Data		
	Design	Actual
SF CFM	1600	1594
RA CFM	1380	1368
OA CFM	220	226
RL Voltage	-	497/496/499
RL Amperage	-	1.05/1.04/1.05
OA Damper Position	-	0.5" MARKED
Brake Horse Power	-	0.76

Motor Data		
	Design	Actual
Motor MFG	-	UTO
Frame	-	UTO
Horsepower	-	1.1
Motor Rpm	-	UTO
Phase	-	3
Rated Voltage	-	460
Rated Amperage	-	1.5
Service Factor	-	NL

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.20"
Fan Suction SP	-	-0.37"
Fan Discharge SP	-	0.62"
Total ESP	0.50"	0.82"
Fan Total SP	-	0.99"

Completed By: Jacob Davidson on 01/26/2023

Notes: [1] MOTOR LABEL NOT ACCESSIBLE. MOTOR INFORMATION TAKEN FROM UNIT LABEL. [2] SPEED SETPOINT AT 7.6VDC POSITION B 35% [3] ECONOMIZER MODULE NOT FUNCTIONING. OA WAS SET MANUALLY.

Date: 01/26/2023

# National TAB

Project:Raymore Commerce Ctr (Raymore, MO)

## AHU/RTU



Comfort. Under control.

**Diffuser Supply (GRD)**

**RTU-1/OFFICE**

Asset							
Asset Name	Location	Type	Size	DESIGN CFM	CFM(1)	FINAL CFM	% to design
1-1	OFFICE	SD-1	10"	400	482	398	99.5
1-2	OFFICE	SD-1	10"	400	478	394	98.5
1-3	OFFICE	SD-1	10"	375	427	384	102.4
1-4	OFFICE	SD-2	6"	25	46	36	144.0
1-5	OFFICE	SD-1	10"	400	474	382	95.5

Completed By: Jacob Davidson on 01/26/2023

Asset	Notes	Date
1-4	DAMPER FULLY CLOSED. UNABLE TO LOWER ANYMORE.	01/26/2023

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

System/Unit: FAN - Exhaust



Comfort. Under control.

Asset: EF-1

AREA:RESTROOM

Unit Data		
	Design	Actual
MFG	GREENHECK	COOK
Model Num	SPA-A110	GEMINI 140 SERIES SONEBUSTER
Serial Num	-	NA

Test Data		
	Design	Actual
CFM	75	90

Motor Data		
	Design	Actual
Motor MFG	-	QUEACE
Horsepower	25W	15W
Motor Rpm	950	1550
Phase	1	1
Voltage (rated)	120	115
Amperage (rated)	-	0.40/0.22

Completed By: Jacob Davidson on 04/06/2023

Notes: UNIT IS TWO SPEED AND SET TO THE LOWEST SPEED POSSIBLE.

Date: 04/06/2023

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## System/Unit: FAN - Exhaust



Comfort. Under control.

Asset: EF-A1

AREA: FIRE SPRINKLER ROOM

Unit Data		
	Design	Actual
MFG	NA	COOK
Model Num	NA	120 ACE 120C15D
Serial Num	-	299sj96172- 00/0000701
Type	-	DOWNBLAST

Test Data		
	Design	Actual
CFM	-	1100
RL Voltage	-	NOT SAFE
RL Amperage	-	NOT SAFE
Suction ESP	-	-0.80"
Discharge ESP	-	ATM
Total ESP	-	0.80

Motor Data		
	Design	Actual
Motor MFG	-	QUEACE
Frame	-	48Y
Horsepower	-	1/4
Motor Rpm	-	1550/1300
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	3.3
Service Factor	-	NL

Completed By: Jacob Davidson on 04/06/2023



Comfort. Under control.

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## System/Unit: FAN - Supply

Asset: MAU-1

AREA:WAREHOUSE

Unit Data		
	Design	Actual
MFG	NA	RUPP AIR SYSTEMS
Model Num	NA	RAM-M 36
Serial Num	-	5242784
Type	-	GAS FIRED
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TECO WESTINGHOUSE
Frame	-	286T
Horsepower	-	30
Motor Rpm	-	1770
Phase	-	3
Voltage (rated)	-	230/460
Amperage (rated)	-	69.4/34.7
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	3B5V54
Motor Bore Size	-	1-7/8"
Fan Sheave Size	-	3B5V0250
Fan Sheave Bore	-	2-7/16"
Belt CL Distance	-	30-1/2"
Num of Belts	-	3
Belt Size	-	5VX-1120
Belt Alignment Verified	-	VERIFIED GOOD

Gas Heat		
	Design	Actual
Heater Operates (y/n)	-	YES
Flame Status (pass/fail)	-	PASS
Inlet Air Temp SetPt	-	55
Discharge Air Temp SetPt	-	60
Air Flow Switch SP Actual	-	0.56

Test Data		
	Design	Actual
CFM	37000	35573
SF RPM	368	2347
Motor RPM	-	1767
RL Voltage	-	491/493/494
RL Amperage	-	27.8/28.4/29.4
Total ESP	-	UTO
Fan Discharge SP	-	UTO

General		
	Design	Actual
Fan Rotation Correct	-	YES

Completed By: Jacob Davidson on 04/06/2023

Notes:OCCUPIED DAMPER POSITION: 2.50VDC

Date:04/06/2023



Comfort. Under control.

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## System/Unit: FAN - Supply

Asset: MAU-2

AREA:WAREHOUSE

Unit Data		
	Design	Actual
MFG	NA	RUPP AIR SYSTEMS
Model Num	NA	RAM-M 36
Serial Num	-	5242784
Type	-	GAS FIRED
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TECO WESTINGHOUSE
Frame	-	286T
Horsepower	-	30
Motor Rpm	-	1770
Phase	-	3
Voltage (rated)	-	230/460
Amperage (rated)	-	69.4/34.7
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	3B5V54
Motor Bore Size	-	1-7/8"
Fan Sheave Size	-	3B5V250
Fan Sheave Bore	-	2-7/16"
Belt CL Distance	-	30-1/2"
Num of Belts	-	3
Belt Size	-	5VX-1120
Belt Alignment Verified	-	VERIFIED GOOD

Gas Heat		
	Design	Actual
Heater Operates (y/n)	-	YES
Flame Status (pass/fail)	-	PASS
Inlet Air Temp SetPt	-	55MIN
Discharge Air Temp SetPt	-	120MAX
Air Flow Switch SP Actual	-	0.77"

Test Data		
	Design	Actual
CFM	37000	36044
SF RPM	368	2345
Motor RPM	-	1779
RL Voltage	-	493/496/494
RL Amperage	-	24.45/24.89/25.98
Total ESP	-	UTO
Fan Discharge SP	-	UTO

General		
	Design	Actual
Fan Rotation Correct	-	YES

Completed By: Jacob Davidson on 04/06/2023

Notes:OCCUPIED DAMPER POSITION: 3.00VDC

Date:04/06/2023



Comfort. Under control.

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## System/Unit: FAN - Supply

Asset: MAU-3

AREA:WAREHOUSE

Unit Data		
	Design	Actual
MFG	NA	RUPP AIR SYSTEMS
Model Num	NA	RAM-M 36
Serial Num	-	5242784
Type	-	GAS FIRED
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TECO WESTINGHOUSE
Frame	-	286T
Horsepower	-	30
Motor Rpm	-	1770
Phase	-	3
Voltage (rated)	-	230/460
Amperage (rated)	-	69.4/34.7
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	3B5V54
Motor Bore Size	-	1-7/8"
Fan Sheave Size	-	3B5V250
Fan Sheave Bore	-	2-7/16"
Belt CL Distance	-	30-1/2"
Num of Belts	-	3
Belt Size	-	5VX-1120
Belt Alignment Verified	-	VERIFIED GOOD

Gas Heat		
	Design	Actual
Heater Operates (y/n)	-	YES
Flame Status (pass/fail)	-	PASS
Inlet Air Temp SetPt	-	55MIN
Discharge Air Temp SetPt	-	120MAX
Air Flow Switch SP Actual	-	0.54"

Test Data		
	Design	Actual
CFM	37000	36568
SF RPM	368	2349
Motor RPM	-	1764
RL Voltage	-	493/492/494
RL Amperage	-	28.7/29.5/29.7
Total ESP	-	UTO
Fan Discharge SP	-	UTO

General		
	Design	Actual
Fan Rotation Correct	-	YES

Completed By: Jacob Davidson on 04/06/2023

Notes: OCCUPIED DAMPER POSITION: 3.00VDC

Date: 04/06/2023



Comfort. Under control.

# National TAB

Project: Raymore Commerce Ctr (Raymore, MO)

## System/Unit: FAN - Supply

Asset: MAU-4

AREA: WAREHOUSE

Unit Data		
	Design	Actual
MFG	NA	RUPP AIR SYSTEMS
Model Num	NA	RAM-M 36
Serial Num	-	5242784
Type	-	GAS FIRED
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TECO WESTINGHOUSE
Frame	-	286T
Horsepower	-	30
Motor Rpm	-	1770
Phase	-	3
Voltage (rated)	-	230/460
Amperage (rated)	-	69.4/34.7
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	3B5V54
Motor Bore Size	-	1-7/8"
Fan Sheave Size	-	3B5V250
Fan Sheave Bore	-	2-7/16"
Belt CL Distance	-	30-1/2"
Num of Belts	-	3
Belt Size	-	5VX-1120
Belt Alignment Verified	-	VERIFIED GOOD

Gas Heat		
	Design	Actual
Heater Operates (y/n)	-	YES
Flame Status (pass/fail)	-	PASS
Inlet Air Temp SetPt	-	55MIN
Discharge Air Temp SetPt	-	120MAX
Air Flow Switch SP Actual	-	0.47"

Test Data		
	Design	Actual
CFM	37000	35416
SF RPM	368	2339
Motor RPM	-	1771
RL Voltage	-	493/491/492
RL Amperage	-	28.7/29.2/29.7
Total ESP	-	UTO
Fan Discharge SP	-	UTO

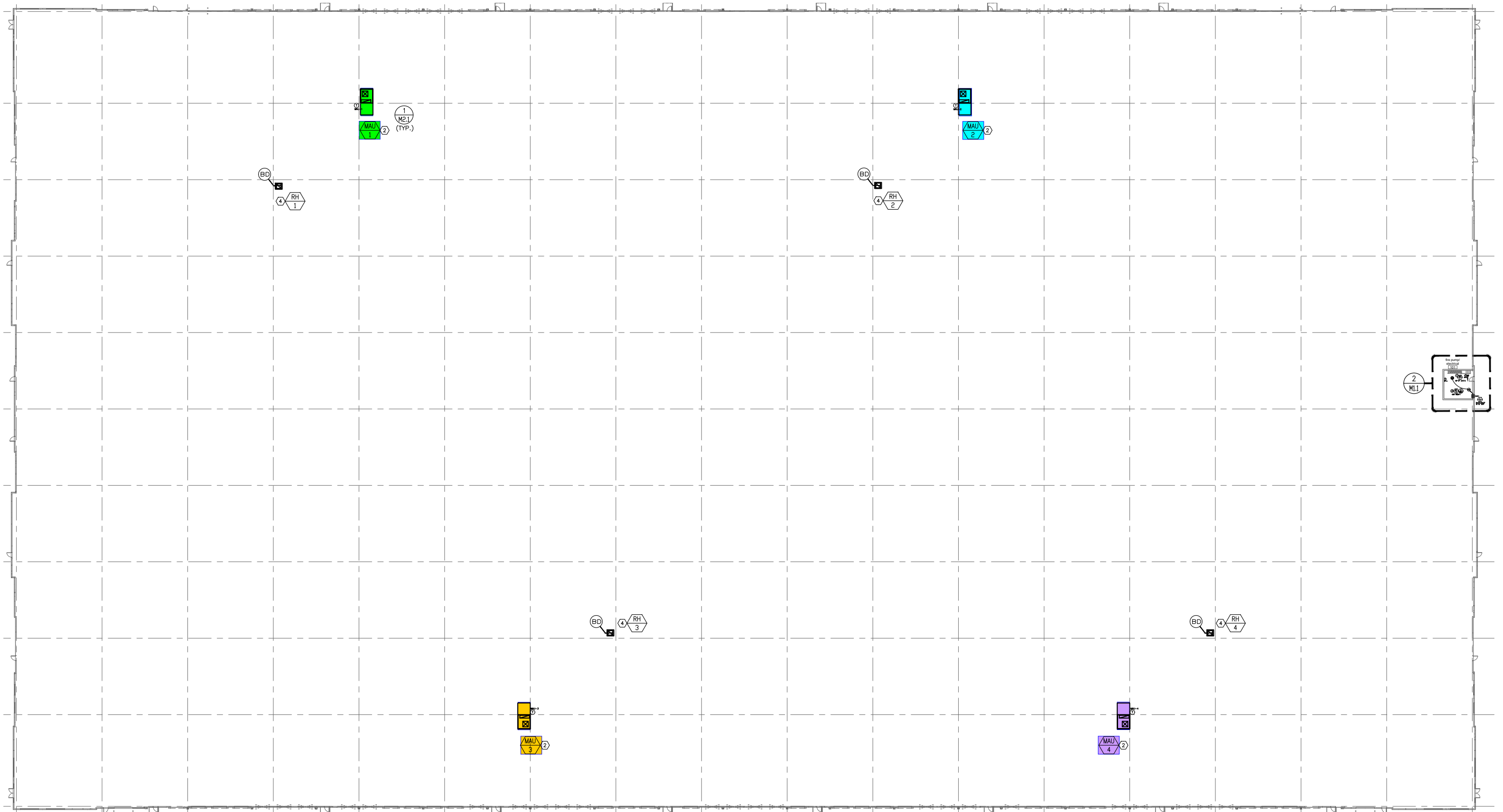
General		
	Design	Actual
Fan Rotation Correct	-	YES

Completed By: Jacob Davidson on 04/06/2023

Notes: OCCUPIED DAMPER POSITION: 2.50VDC

Date: 04/06/2023





# 1 Overall Mechanical Floor Plan