Report By:

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

Report: TAB report

Function: Test, Adjust, & Balance

Date: 04/15/2024

PROJECT

Sinclair Innovation Lab (Dayton, OH)

444 W 3rd Street

Dayton, OH 45402

Client

Triton Services, Inc.

8162 Duke Boulevard

Mason, OH 45040

National TAB

Project: Sinclair Innovation Lab (Dayton, OH)

Table Of Contents

CERTIFICATION

PROJECT: Mercedes Benz (West Chester, OH)

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 Standards for Testing, Adjusting, and Balancing of Environmental Systems.* Any variances from design quantities, which exceed NEBB tolerances, are noted in the Test-Adjust-Balance Report Project Summary.

The air distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM:	National TAB
REGISTRATION NO:	3629
CERTIFIED BY:	Joe Hertenstein
DATE:	4/18/2024

The hydronic distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM:	National TAB
REGISTRATION NO:	3629
CERTIFIED BY:	Joe Hertenstein
DATE:	

Submitted and Certified by:

NEBB TAB FIRM:	National TAB
TAB PROFESSIONAL:	Joe Hertenstein
SIGNATURE:	Joe Hertenstein
REGISTRATION NO:	3629
CERTIFICATION EXP:	12/31/2024

Function		Range	Minimum Accuracy	Instrument Information	Calibration Date	Date Due
AIR	AIR PRESSURE	0 in wg to 10 in wg	2% +/- 0.001 in wg	Kanomax Micromanometer 6700 S/N 30513	7/23/2023	7/27/2024
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	Kanomax Micromanometer 6700 S/N 30513	7/23/2023	7/7/2024
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 5 % +/- 7 cfm	Kanomax Micromanometer 6700 S/N 30513	7/23/2023	7/7/2024
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 071118034	6/6/2023	6/6/2024
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 5028	6/6/2023	6/6/2024
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 071118034	6/6/2023	6/6/2024
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 1075	6/6/2023	6/6/2024
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 071118034	6/6/2023	6/6/2024
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 4011	6/6/2023	6/6/2024
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper ATKINS - SRH77A S/N 071118034	6/6/2023	6/6/2024
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Fluke 373 True RMS, S/N: 33290686	6/1/2023	6/1/2024
	AMPERAGE MEASUREMENT	0 Amperers to 100 Amperes	2 % reading +/- 5 digits	Fluke 373 True RMS, S/N: 33290686	6/1/2023	6/1/2024
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	SHIMPO DT-207LR S/N: D1530081R	6/1/2023	6/1/2024
HYDRONIC	PRESSURE MEASUREMENT	-30 in Hg to 200 psi	±2% of reading +/- 1 psi	Alnor HM675 S/N: 72214041	5/2023	5/2024
	DIFFERENTIAL PRESSURE MEASUREMENT	0 psi - 80 psi	±2% of reading +/- 1 psi	Alnor HM675 S/N: 72214041	5/2023	5/2024

Abbreviation List

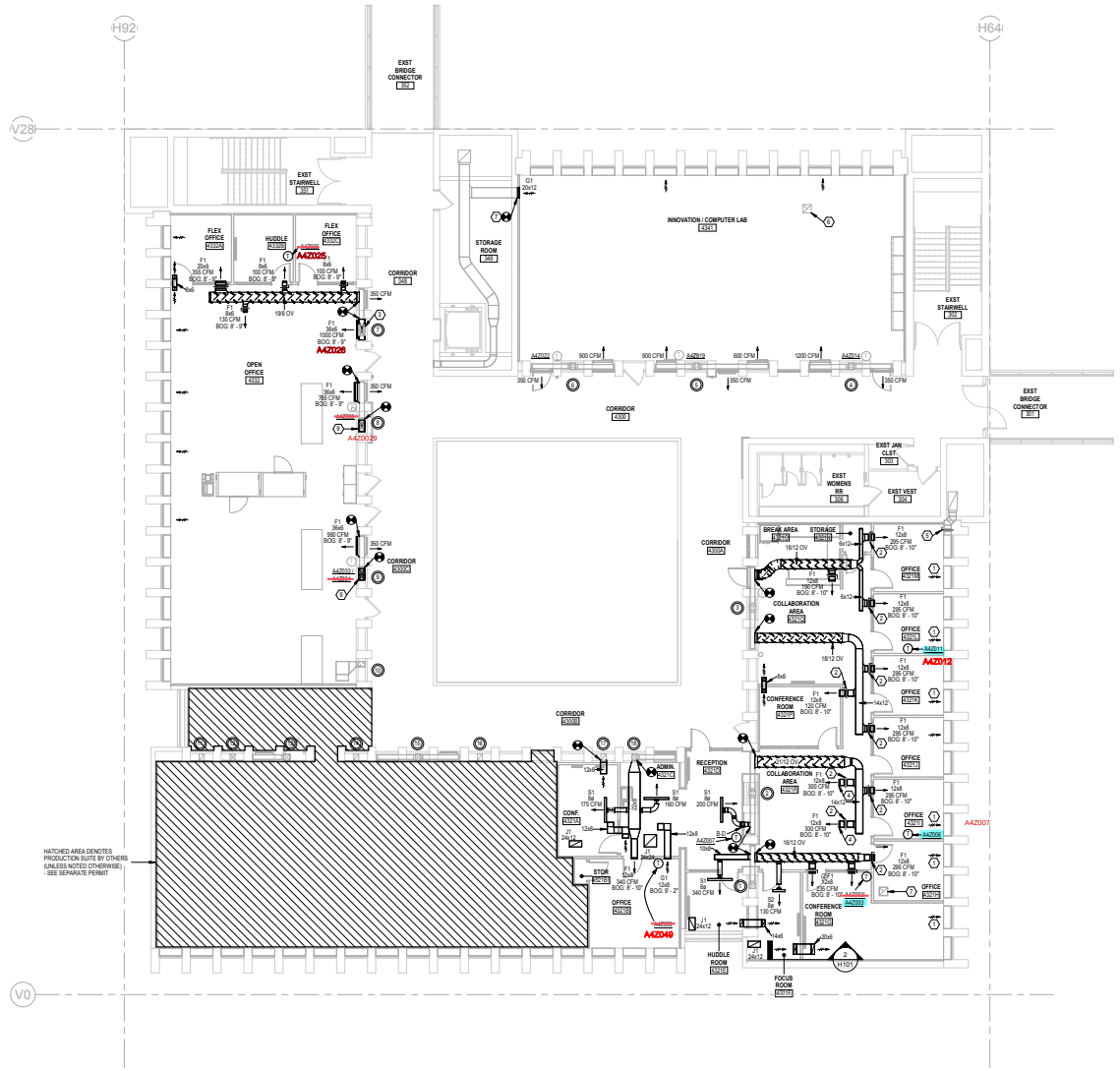
A = Area (ft^2)	S.F. = Service Factor
AHU = Air Handling Unit	SF = Supply Fan
A_k = Effective Area	SP = Static Pressure
BHP = Brake Horsepower (IP) HP	SR = Supply Register
Btu = British Thermal Unit	T = Temperature
Btu/h = Btuh = BTUH = BTU/Hour	T_{ma} = Mixed Air Temperature
CL = Center Distance (used in belt formula)	T_{oa} = Outside Air Temperature
CD = Ceiling Diffuser	T_{ra} = Return Air Temperature
CF = Correction Factor	H = Head (in wc, ft wc, psi)
CFM = Volumetric Flow: Cubic Feet Per Minute	h = Enthalpy
CO2 = Carbon Dioxide	HP = Horsepower
CO = Carbon Monoxide	hr = Hour
C_v = Flow Constant	K_v = Flow constant (SI)
d = Diameter (in.) IP	kW = Kilowatt = 1000 Watts
Δ = Difference or Change (Final - Initial)	LAT = Leaving Air Temperature
DB = Dry Bulb	lb = Pounds
EA = Exhaust Air	LWT = Leaving Water Temperature
EAT = Entering Air Temperature	ma = Mixed Air
EF = Exhaust Fan	MIN = Minimum
Eff = Efficiency	MAX = Maximum
EG = Exhaust Grille	N/A = Not Applicable
ESP = External Static Pressure	NA = No Access
EWT = Entering Water Temperature	NL = Not Listed
°F = Degrees Fahrenheit, °F	NPSHA = Net Positive Suction Head Available
FPB = Fan Powered Box	NS = Not Specified
FLA = Full Load Amps	OA = Outside Air
fpm = Feet per Minute (fpm)	OAT = Outside Air Temperature
ft = Foot	PD = Sheave Pitch Diameter
gal = Gallons	P.D. = Pressure Drop
GPM = Gallons Per Minute (GPM)	PF = Power Factor
h = Enthalpy (BTU/lb dry air)	SG = Supply Grille
P = Pressure	SR = Supply Register
ppm = parts per million	TP = Total Pressure
psi = Pounds Per Square Inch	T_{ra} = Return Air Temperature
psid = PSI Differential	TS = Tip Speed (fpm) IP, (m/s) SI
r = Radius (in)	TSP = Total Static Pressure
$\%_{ra}$ = % of Return Air	V = Velocity
RA = Return Air	VAV = Variable Air Volume
RAT = Return Air Temperature	VD = Volume Damper
RF = Return Fan	VFD = Variable Frequency Drive
RG = Return Grille	W = Watt
RH = Relative Humidity	WB = Wet Bulb
RPM = Revolutions Per Minute	wg = wc = water gauge = water column
RTU = Roof Top Unit	WHP = Water Horsepower (IP)
SA = Supply Air	ω = Humidity Ratio

GENERAL NOTES

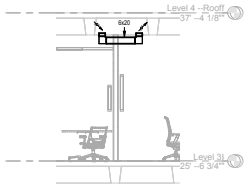
A. HATCHED DUCTWORK SHALL BE DOUBLE WALL INSULATED. REFER TO DUCT CONSTRUCTION SCHEDULE.

NOTES

1. PROVIDE NEW RETURN AIR OPENING IN LOCATION SHOWN. REFER TO DETAIL ON SHEET H002.
2. PROVIDE CABLE-ACTUATED REMOTE BALANCING DAMPER IN SUPPLY REGISTER RUNOUT DUCT. REMOTE BALANCING DAMPER SHALL BE YOUNG REGULATOR 830ACC OR APPROVED EQUAL.
3. TRANSITION DUCT WITHIN SHAFT AS REQUIRED FOR CONNECTION TO NEW AIR DEVICE.
4. AIR DEVICE LOCATED IN FACE OF NEW SOFFIT. COORDINATE EXACT LOCATION WITH ARCHITECTURAL DRAWINGS.
5. PROVIDE NEW MANUAL BALANCING DAMPER IN EXISTING RETURN AIR DUCT.
6. CAP AND INSULATE EXISTING EXHAUST DUCT AT ROOF PENETRATION. EXISTING FAN ON ROOF TO REMAIN.
7. PROVIDE NEW RETURN GRILLE FULL SIZE OF EXISTING DUCT. PROVIDE NEW SECTION OF RETURN DUCTWORK FULL SIZE OF EXISTING TO EXTEND ACROSS NEW WALL.
8. PROVIDE LINEAR SLOT DIFFUSER FRAME THAT IS APPROPRIATE FOR CEILING TYPE. REFER TO REFLECTED CEILING PLANS.
9. COMBINE AND TRANSITION EXISTING 10X12 AND 12X12 DUCTWORK RISERS INTO A SINGLE 24X12 DUCT RISER.



1 **HVAC LEVEL 3**
SCALE: 1/8" = 1'-0"



2 **TYPICAL TRANSFER AIR DUCT**
SCALE: 1/4" = 1'-0"

0 4 8 16 24

CHAMPLIN ARCHITECTURE
10 S Patterson Blvd
Dayton, OH 45402
T 937.224.4474
thinkchamplin.com
THINK CREATE REALIZE

HEAPY
1400 W Dorothy Lane, Dayton, OH 45409
T 937.224.0861

2202 S Patterson Blvd, Dayton OH 45409
T 937.299.4631

FAC 23-04
eLEARNING, CTL, INNOVATIONS LAB, PRODUCTION STUDIO

SINCLAIR COMMUNITY COLLEGE

444 W 3rd St,
Dayton, OH 45402
Building 4

SCC PROJECT #: FAC 23-04

ISSUANCES

No.	Description	Date
1	60% DD SET	01/16/2023
2	75% CD SET	01/30/2023
3	90% CD SET	02/13/2023
4	98% CD SET	03/20/2023
5	CONSTRUCTION DOCS	04/07/2023
6	ADDENDUM #1	04/21/2023
8	CONFORMED SET	06/16/2023
10	PROPOSAL REQUEST 03	08/30/2023
17	PROPOSAL REQUEST 12	11/03/2023

Drawn By: SYC
Checked By: LGO
Client No.: 659
Project No.: 8064

STATE OF OHIO · LANE G. OATMAN · 72082 · REGISTERED PROFESSIONAL ENGINEER · 11-15-2023

THIRD FLOOR NEW WORK

H101

3/25/2024 8:58:14 AM

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Project:Sinclair Innovation Lab (Dayton, OH)

VAV - Single Duct

VAV's/

Asset					
Asset Name	**Type**	**Inlet Size**	**Design Max CFM**	**Max CFM**	**Ak (max)**
A4Z002	VVR	12	1235	640	0.58
A4Z003	VVR	10	1235	925	0.51
A4Z006	VVR	12	1095	577	0.72
A4Z007	VVR	10	1095	1088	0.54
A4Z011	VAV	10	710	489	0.55
A4Z012	VVR	12	1130	1115	0.52
A4Z025	VVR	12	1035	971	0.74
A4Z026	VAV	12	1100	1152	0.68
A4Z029	VVR	12	1115	1124	0.56
A4Z033	VVR	12	1340	1288	0.69
A4Z034	VVR	12	1340	152	0.62
A4Z049	VVR	12	675	522	0.41

Completed By: Nick Payne on 04/03/2024

Asset	Notes	Date	Written By
A4Z002	Max cool set to 1230 (Connected load). Traversed at VAV inlet 10" with VAV damper open 10 0%. 1.4" sp in traverse. Flow reached 640cfm. .	04/03/2024	Nick Payne
A4Z003	Max CFM Acheived with vav damper 100% open = 925	04/04/2024	Nick Payne
A4Z006	Max cool set to 1095 (Connected load). Traversed at VAV outlet, 14x14, with VAV damper open 100%. 1.28" sp in traverse. Flow reached 577cfm.	04/03/2024	Nick Payne
A4Z007	CONNECTED LOAD IS 1095 CFM	04/04/2024	Nick Payne
A4Z011	VAV Damper open 100%, only achieving 489CFM.	04/04/2024	Nick Payne
A4Z025	CONNECTED LOAD IS 1400 CFM	03/18/2024	Michael Gabbert
A4Z029	CONNECTED LOAD IS 1115 CFM	04/03/2024	Nick Payne
A4Z033	CONNECTED LOAD IS 1340CFM	04/03/2024	Nick Payne
A4Z034	Max cool set to 1340cfm (Connected load). Traversed at VAV outlet, 12x12, with VAV damper op en 100%. 1.05" sp in traverse. Flow reached 157cfm.	04/03/2024	Nick Payne
A4Z049	CONNECTED LOAD IS 675CFM. VAV damper 100% open. Flow is achieving maximum of 522c fm.	04/04/2024	Nick Payne

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Project:Sinclair Innovation Lab (Dayton, OH)

Diffuser Supply (GRD)

A4Z012/4332

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
11-1	4321M	F1	12X8	295	250	307	104.1
11-2	4321L	F1	12X8	295	260	285	96.6
11-3	4321K	F1	12X8	190	140	194	102.1
11-4	COOR	F1	12X8	350	184	329	94.0
Total				1130	834	1115	98.67%

A4Z003/SAME SA DUCT AS A4Z002

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
2-1	4321E	F1	12X8	340	99	257	75.6
2-2	4321F	F1	12X8	130	105	100	76.9
2-3	4321G	F1	12X8	235	99	189	80.4
2-4	4321G	F1	12X8	235	0	174	74.0
2-5	4321H	F1	12X8	295	55	205	69.5
Total				1235	358	925	74.9%

A4Z025/4332A

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
26-1	348	F1	36X6	355		342	96.3
26-2	4332C	F1	8X6	100		106	106.0
26-3	4332B	F1	8X6	100		95	95.0
26-4	4332A	F1	8X6	130		99	76.2
26-5	COOR	SG1	4X24	350		329	94.0
Total				1035	0	971	93.82%

A4Z049/4321B

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
50-1	4321C	A1	8	160	90	120	75.0
50-2	4321A	A1	8	175	88	112	64.0
50-3	4321B	S1	10	340	369	290	85.3
Total				675	547	522	77.33%

A4Z007/SAME SA DUCT AS A4Z006

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
7-1	4321D	F1	10X6	200	184	205	102.5
7-2	4321R	F1	12X8	300	254	310	103.3
7-3	4321I	F1	12X8	295	228	285	96.6
7-4	4321R	F1	12X8	300	277	288	96.0
Total				1095	943	1088	99.36%

A4Z011/OFFICES

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
A4Z011-SGRD1	4321K	SG	8X8	295	160	160	54.2
A4Z011-SGRD2	4321P	SG	8X8	120	166	166	138.3
A4Z011-SGRD3	4321J	SG	8X8	295	163	163	55.3
Total				710	489	489	68.87%

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Project:Sinclair Innovation Lab (Dayton, OH)

Circuit Setter

HW/

Asset							
Asset Name	**Size**	**Type**	**Design GPM**	**Setting**	**Delta P**	**Final GPM**	**% to Design**
A4Z002	0.75	MANUAL	1.0	30	1.4tf	1.03	100.0
A4Z003	0.75	MANUAL	1.0	26	1.2ft	1.01	100.0
A4Z006	0.75	MANUAL	1.0	15	0.5ft	1.08	110.0
A4Z007	0.75	MANUAL	1.0	40	3.7ft	1.09	110.0
A4Z011	0.75	MANUAL	1.1	40	4.2ft	1.1	100.0
A4Z012	0.75	MANUAL	1.6	30	3.8ft	1.68	106.3
A4Z025	0.75	MANUAL	1.7	35	5.2ft	1.65	100.0
A4Z026	0.75	MANUAL	1.6	32	4.8ft	1.58	100.0
A4Z029	0.75	MANUAL	1.2	30	3.5ft	1.18	100.0
A4Z033	0.75	MANUAL	1.6	30	4.0ft	1.54	93.8
A4Z034	0.75	MANUAL	1.2	33	4.1ft	1.3	108.3
A4Z049	0.75	MANUAL	1.6	30	3.5ft	1.63	100.0
Total			15.6			15.87	101.73%