



CERTIFIED TEST, ADJUST AND BALANCE REPORT

DATE: June 10, 2014

PROJECT:

NAME:

ADDRESS:

DRAFT REPORT

St. Lukes East Hospital Kitchen / Dining Exp.

100 Northeast Saint Lukes Boulevard

Lee Summit, Missouri

ARCHITECT:

NAME:

ADDRESS:

ACI Boland

1421 East 104th Street

Kansas City, Missouri

HVAC DESIGN ENGINEER:

NAME:

ADDRESS:

W.L. Cassell and Associates

1600 Baltimore Street

Kansas City, Missouri

GENERAL CONTRACTOR:

NAME:

ADDRESS:

JE Dunn

1001 Locust Street

Kansas City, Missouri

MECHANICAL CONTRACTOR:

NAME:

ADDRESS:

US Engineering

3422 Roanoke Road

Kansas City, Missouri

SHEET METAL CONTRACTOR:

NAME:

ADDRESS:

US Engineering

3422 Roanoke Road

Kansas City, Missouri

NEBB Certification No.: 3158



DOYLE FIELD SERVICES, INC.
Commissioning, Validation Balancing Agents
2400 West 75th Street, Suite 102, Prairie Village, KS. 66208
Office - 913.677.3374 Fax - 913.671.7483 www.dfstesting.com



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CERTIFICATION

Project: St. Lukes East Hospital Kitchen / Dining E

Location: Lee Summit, Missouri

Tech: Danny Godden

Date: 6/10/2014

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 that exceed NEBB tolerances are noted in the Test, Adjust and Balance Report Project Summary.

Submitted and Certified By:

Doyle Field Services, Inc.

NEBB Certification No.:

3158

NEBB Certification Expiration Date:

3/31/2016

Report Date:

6/10/2014

NEBB
SEAL

NEBB Qualified TAB Supervisor:

Name:

Dennis T. Doyle

Signature:



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INSTRUMENT CALIBRATION REPORT

Project: St. Lukes East Hospital Kitchen / Dining E Location: Lee Summit, Missouri

Location: Lee Summit, Missouri

Tech: _____ Date: 6/10/2014

Date: 6/10/2014

[illegible]

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ABBREVIATIONS

Project: St. Lukes East Hospital Kitchen / Dining Exp.

Location: Lee Summit, Missouri

Tech: _____

Date: 6/10/2014

Abbreviations

CFM = Cubic Feet Per Minute
GPM = Gallons Per Minute
AMP = Amperage
KW = Kilowatt
HP = Horsepower
RPM = Revolutions Per Minute
SP = Static Pressure
E.S.P = External Static Pressure
DD = Direct Drive
SQFT or SF = Square Feet
FPM = Feet Per Minute
HZ = Hertz
N/A = Not Applicable
NG = Not given
3D = Triple Duty Valve
CW = Chilled Water
HHW = Heating Hot Water
DW = Domestic Water
LHW = Laboratory Hot Water
CNR = Can Not Read
"W.G. or inwc = Inches in Water Column
AK = Albert Keane
DG = Daniel Godden
JC = James Coin
TD = Tom Doyle
DN = Danny Noble
EO = Eric Ortega



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SUMMARY

Project: St. Lukes East Hospital Kitchen / Dining Exp.

Location: Lee Summit, Missouri

Tech: Danny Godden

Date: 6/10/2014

Project Notes / Summary

This project consisted of the expansion of the kitchen and dining area at St. Lukes Hospital in Lee Summit, Missouri. Phase 1 consisted of the test and balance of 2 new variable air volume terminal units (VAV) and 1 existing VAV. These VAV's are controlled by Johnson Controls and have hot water re-heat for temperature control. In addition, a new kitchen hood was installed and is served by an existing exhaust fan and make up air unit (MUA). The MUA unit was proportionally balanced so that the existing kitchen hoods would have the same airflow originally measured by the pretest. Return grilles were also balanced as part of this phase.



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Deficiency List

Project: St. Lukes East Hospital Kitchen / Dining Exp.

Location: Lee Summit, Missouri

Tech: Danny Godden

Date: 6/10/2014

The existing general exhaust grille that is served off of the new kitchen hood does not have a manual balance damper installed.

The new kitchen hood exhaust drops do not have manual balance dampers installed.

Any minor deficiencies will be found in the project notes at the bottom of the test pages.



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VAV/EAV TERMINAL UNIT TEST REPORT

Project: St. Lukes East Hospital Kitchen / Dining E Location: Lee Summit, Missouri

Tech: Danny Godden Date: 6/9/2014

VAV/EAV TERMINAL UNIT DATA								
Unit	VAV 3-1			Design Minimum	654			
System	Supply / AHU-3			Actual Minimum	664			
Size (Inches)	12			Flow Coefficient	2.176			
VAV/EAV TERMINAL UNIT OUTLET/INLET DATA								
AREA OR ROOM NUMBER	OUTLET			DESIGN CFM	PRELIM. CFM	FINAL		
	NO.	TYPE	SIZE			CFM	%	Comments
Kitchen Area	1	C		250	326	248	99	
Kitchen Area	2	C		250	274	265	106	
Kitchen Area	3	C		250	218	247	99	
Kitchen Area	4	C		250	293	239	96	
Kitchen Area	5	C		250	237	245	98	
Kitchen Area	6	C		250	250	242	97	
Kitchen Area	7	C		250	275	268	107	

VAV/EAV TERMINAL UNIT DATA								
Unit	VAV 3-2 (Existing)			Design Minimum	2100			
System	Supply / AHU-3			Actual Minimum	2,131			
Size (Inches)	14			Flow Coefficient	1.450			
VAV/EAV TERMINAL UNIT OUTLET/INLET DATA								
AREA OR ROOM NUMBER	OUTLET			DESIGN CFM	PRELIM. CFM	FINAL		
	NO.	TYPE	SIZE			CFM	%	Comments
Kitchen Area	1	C		350	457	355	101	
Kitchen Area	2	C		350	471	374	107	
Kitchen Area	3	C		350	424	341	97	
Kitchen Area	4	C		350	456	325	93	
Kitchen Area	5	C		350	309	358	102	
Kitchen Area	6	C		350	515	378	108	

Remarks:



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VAV/EAV TERMINAL UNIT TEST REPORT

Project: St. Lukes East Hospital Kitchen / Dining E Location: Lee Summit, Missouri

Tech: _____ Date: _____

VAV/EAV TERMINAL UNIT DATA								
Unit	VAV 3-3			Design Minimum				
System	Supply / AHU-3			Actual Minimum				
Size (Inches)	16			Flow Coefficient				
VAV/EAV TERMINAL UNIT OUTLET/INLET DATA								
AREA OR ROOM NUMBER	OUTLET			DESIGN CFM	PRELIM. CFM	FINAL		
	NO.	TYPE	SIZE			CFM	%	Comments
Dining	1	C		275			0	
Dining	2	C		275			0	
Dining	3	C		275			0	
Dining	4	C		275	PHASE	2	1	
Dining	5	C		275			0	
Dining	6	C		275			0	
Dining	7	C		300			0	
Dining	8	C		275			0	
Dining	9	C		275			0	
TOTALS:				2,500	0	2	0	

VAV/EAV TERMINAL UNIT DATA								
Unit	VAV 3-4			Design Minimum	900			
System	Supply / AHU-3			Actual Minimum	0			
Size (Inches)	9			Flow Coefficient				
VAV/EAV TERMINAL UNIT OUTLET/INLET DATA								
AREA OR ROOM NUMBER	OUTLET			DESIGN CFM	PRELIM. CFM	FINAL		
	NO.	TYPE	SIZE			CFM	%	Comments
Self Serve Area	1	C		450			0	
Self Serve Area	2	C		450			0	
					PHASE	2		
TOTALS:				900	0	2	0	

Remarks: _____



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VAV/EAV TERMINAL UNIT TEST REPORT

Project: St. Lukes East Hospital Kitchen / Dining E Location: Lee Summit, Missouri

Tech: Danny Godden Date: 6/9/2014

VAV/EAV TERMINAL UNIT DATA								
Unit	VAV 3-5			Design Minimum				
System	Supply / AHU-3			Actual Minimum				
Size (Inches)	16			Flow Coefficient				
VAV/EAV TERMINAL UNIT OUTLET/INLET DATA								
AREA OR ROOM NUMBER	OUTLET			DESIGN CFM	PRELIM. CFM	FINAL		
	NO.	TYPE	SIZE			CFM	%	Comments
Corridor	1	C		200			0	
Corridor	2	C		200			0	
Corridor	3	C		200			0	
Kitchen	4	C		300			0	
Storage	5	A		100	PHASE	2	2	
Serving	6	C		300			0	
Serving	7	C		300			0	
Serving	8	C		350			0	
Serving	9	C		300			0	
TOTALS:				2,250	0	2	0	

VAV/EAV TERMINAL UNIT DATA								
Unit	VAV 3-7			Design Minimum	895			
System	Supply / AHU-3			Actual Minimum	908			
Size (Inches)	9			Flow Coefficient	1.889			
VAV/EAV TERMINAL UNIT OUTLET/INLET DATA								
AREA OR ROOM NUMBER	OUTLET			DESIGN CFM	PRELIM. CFM	FINAL		
	NO.	TYPE	SIZE			CFM	%	Comments
Dry Storage	1	B		165	190	176	107	
Dry Storage	2	B		165	161	179	108	
Dry Storage	3	B		165	16	154	93	
Chef	4	B		200	225	206	103	
Dietary	5	B		200	190	193	97	
TOTALS:				895	782	908	101	

Remarks:



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DUCT TRAVERSE TEST REPORT (RECTANGULAR)

Project: St. Lukes East Hospital Kitchen / Dining E Location: Lee Summit, Missouri

Tech: DG Unit: MAU/AHU-8 Location: Kitchen Date: 6/9/2014

DUCT INFORMATION		DESIGN AIRFLOW		ACTUAL AIRFLOW	
Inside Width (In.):	28.00	FPM	1,029	FPM	1,123
Inside Depth (In.):	18.00	CFM	3,603	SCFM	
Area (Sq. Ft.)	3.500	S.P. (In. W.G.)	N/A	CFM	3,931

VELOCITY READINGS (FPM)										
Position	1	2	3	4	5	6	7	8	9	10
1	1,469	1,350	1,238	1,251	1,362	1,036				
2	1,451	1,724	1,555	1,395	988	1,274				
3	1,606	1,371	1,120	1,355	1,704	485				
4	488	400	300	701	921	414				
5										
6										
7										
8										
9										
10										
Totals	5,014	4,845	4,213	4,702	4,975	3,209	0	0	0	0
No. Of Readings	4	4	4	4	4	4	0	0	0	0

Sum of columns 1 - 10: 26,958

Average velocity (FPM): 1,123

Total number of readings: 24

Total Airflow (CFM): 3,931

Remarks: The new kitchen hood was tested with all 3 hoods running.

There is not an applicable way to read by flow hood, DFSI has proportionally balanced the supply grilles by Vell Grid.



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SUPPLY / EXHAUST AIR OUTLET / INLET TEST REPORT

Location: Lee Summit, Missouri

Unit:

Date: 6/9/2014

[illegible]

*NOTE: If AK = 1.00, velocity information and measurements are not required.

Remarks: These reading were taken after the new hood was balanced.



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SUPPLY / EXHAUST AIR OUTLET / INLET TEST REPORT	
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Project: St. Lukes East Hospital Kitchen / Dining E Location: Lee Summit, Missouri

Location: Lee Summit, Missouri

Tech: DG Unit: Existing Return Date: 6/9/2014

Unit: Existing Return Date: 6/9/2014

Date: 6/9/2014

[illegible]

*NOTE: If AK = 1.00, velocity information and measurements are not required.

Remarks: _____



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SUPPLY / EXHAUST AIR OUTLET / INLET TEST REPORT

Project: St. Lukes East Hospital Kitchen / Dining E Location: Lee Summit, Missouri

Location: Lee Summit, Missouri

Tech: _____ Unit: Existing Exhaust Date: _____

Unit: Existing Exhaust Date: _____

Date: _____

[illegible]

*NOTE: If AK = 1.00, velocity information and measurements are not required.

Remarks: _____



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CAPTIVE-AIRE KITCHEN HOOD TEST REPORT

Project: St. Lukes East Hospital Kitchen / Dining Ex

Location: Lee Summit, Missouri

Tech: DG

Unit: New Kitchen Hood

Date: 6/9/2014

Hood #	Inlet #3		Design Total CFM: 2242				Actual Total CFM: 2,057			
Hood Make:	Captive-Aire		Model Number: 5424 ND-2				Serial Number: NG			
Filter Size	16" x 20"	16" x 20"	16" x 20"	16" x 20"	16" x 16"	16" x 20"				
Sq. Ft.	1.73	1.73	1.73	1.73	1.35	1.73	0.00	0.00	0.00	0.00
Velocity (FPM)	161	177	188	181	164	156				
K-Factor	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
CFM	334	367	390	376	266	324	0	0	0	0

Hood #	Inlet #4		Design Total CFM: 2262				Actual Total CFM: 1,829			
Hood Make:	Captive-Aire		Model Number: 5424 ND-2				Serial Number: NG			
Filter Size	16" x 16"	16" x 20"	16" x 20"	16" x 20"	16" x 20"	16" x 20"				
Sq. Ft.	1.35	1.73	1.73	1.73	1.73	1.73	0.00	0.00	0.00	0.00
Velocity (FPM)	131	146	225	151	129	128				
K-Factor	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
CFM	212	303	467	313	268	266	0	0	0	0

Hood #			Design Total CFM:				Actual Total CFM: 0			
Hood Make:	Captive-Aire		Model Number:				Serial Number: NG			
Filter Size	No Filter									
Sq. Ft.	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Velocity (FPM)										
K-Factor	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
CFM	0	0	0	0	0	0	0	0	0	0

Hood #			Design Total CFM:				Actual Total CFM: 0			
Hood Make:	Captive-Aire		Model Number:				Serial Number: NG			
Filter Size	No Filter									
Sq. Ft.	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Velocity (FPM)										
K-Factor	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
CFM	0	0	0	0	0	0	0	0	0	0

Hood #			Design Total CFM:				Actual Total CFM: 0			
Hood Make:	Captive-Aire		Model Number:				Serial Number: NG			
Filter Size	No Filter									
Sq. Ft.	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Velocity (FPM)										
K-Factor	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
CFM	0	0	0	0	0	0	0	0	0	0

Remarks: _____



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SUPPLY / EXHAUST AIR OUTLET / INLET TEST REPORT

Project: St. Lukes East Hospital Kitchen / Dining E Location: Lee Summit, Missouri

Location: Lee Summit, Missouri

Tech: DG

Unit: Existing Exhaust

Date: 6/9/2014

[illegible]

*NOTE: If AK = 1.00, velocity information and measurements are not required.

Remarks: Inlets #2,3,&4 do not have manual balance dampers installed.



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BALANCING VALVE TEST REPORT (MANUAL)

Project: St. Lukes East Hospital Kitchen / Dining E Location: Lee Summit, Missouri

Location: Lee Summit, Missouri

Tech: DG System: HHW Date: 6/9/2014

System: HHW Date: 6/9/2014

Date: 6/9/2014

[illegible]

Remarks: _____



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