

# **AIR BALANCING SPECIALTY INC.**

## **JOHN WETTEN ELEMENTARY SCHOOL GLADSTONE, OREGON**

**PROJECT NO: 20-4242-D**

AIR BALANCING SPECIALTY INC. 3532 S.E. MILWAUKIE AVENUE PORTLAND, OREGON 97202-2751  
IN BUSINESS SINCE 1964 CERTIFIED NEBB FIRM - CERTIFICATION NO. 2984  
PHONE (503) 230-2332 FAX (503) 230-2820

PROJECT NAME: **JOHN WETTEN ELEMENTARY SCHOOL - GLADSTONE, OREGON**

ARCHITECT: DATE STARTED: 12/01/20 DATE FINISHED: 12/15/20

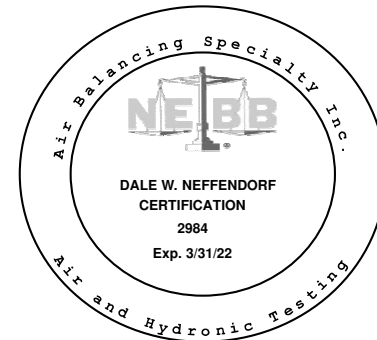
MECHANICAL ENGINEER: WORK PERFORMED BY: DALE NEFFENDORF

GENERAL CONTRACTOR: CERTIFIED BY: \_\_\_\_\_

MECHANICAL CONTRACTOR: DATE: \_\_\_\_\_

SHEET METAL CONTRACTOR:

CONTROL CONTRACTOR: NORTHWEST CONTROL COMPANY  
PO BOX 22919  
MILWAUKIE, OR. 97726



IN BUSINESS SINCE 1964

**AIR BALANCING SPECIALTY INC.**

CERTIFIED NEBB No. 2984

3532 SE Milwaukie Avenue Portland, Oregon 97202-2751 Phone (503) 230-2332 Fax (503) 230-2820

**CERTIFIED TEST AND BALANCE REPORT**

**PROJECT NO.: 20-4242-D**

<b>INSTRUMENT AIR</b>	<b>MODEL NO.</b>	<b>SERIAL NO.</b>	<b>RANGE</b>	<b>CALIBRATION DATE</b>
(D) Shortridge Airdata Multimeter ADM Accessories	ADM860	M90214	0.0001 to 60.00" WC.	11/14/2019
(DH) Datameter Flow Hood	8400		25 - 2500 CFM	
(DP) Datameter Pitot Tube	12", 18", 24", 36", 48" & 60"		50 - 30000 FPM	
(DA) Datameter Airfoil	AFP18		50 - 5000 FPM	
(DG) Datameter Velgrid	VLG84		50 - 2500 FPM	
Rotating Vane Anemometer	A4/-4"	71537	200 - 10000 FPM	11/13/2019
Amprobe Ammeter	Fluke 335	11100082	0 - 750 Volts / 0 - 300 Amps	11/13/2019
Shimpo Tachometer	DT-207L	D096B0082	6 - 30,000 RPM	11/13/2019
<b>WATER</b>				
Hydrodata Meter	HDM-250	W96144	DP -10 to +300 PSI	11/14/2019

IN BUSINESS SINCE 1964

## AIR BALANCING SPECIALTY INC.

CERTIFIED NEBB No. 2984

3532 SE Milwaukie Avenue Portland, Oregon 97202-2751 Phone (503) 230-2332 Fax (503) 230-2820

### EQUIPMENT USED IN BALANCING

PROJECT: JOHN WETTEN ELEMENTARY SCHOOL - GLADSTONE, OREGON

PROJECT NO.: 20-4242-D

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
	R	Room 1			18x6	SW	0.45			450	203	550	248							
		Temp / RH								51.4 / 48.7		56.5 / 46.9								
		Cubic Feet							2174											
		Air Changes per hour (ACH)								5.60		6.85								
	R	Office / Speech		1	14x8	SW	0.54			400	216	330	178							
	R	Office / Speech		2	14x8	SW	0.54			450	243	390	211							
		<b>Total</b>								<b>459</b>		<b>388</b>								
		Temp / RH								55.3 / 46.7		56.9 / 46.2								
		Cubic Feet							2808											
		Air Changes per hour (ACH)								9.80		8.31								
		Bathroom EF																		
	DH						1.00				40									
		Cubic Feet							336											
		Air Changes per hour (ACH)								7.14										
		Pressure								-0.010"										

Ref	Ins	AREA SERVED	OUTLETS			Blow	AK	DESIGN		TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size			Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
		<b>DOAS</b>																		
									<b>Cubic Ft</b>										<b>ACH</b>	
	DH	Classroom	2		12x12	1W	1.00		7628	230	1.81			54.5 / 46.1		615		4.84		
	DH	Classroom	3		12x12	1W	1.00		8053	90				61.3 / 38.7		620		4.62		
	DH	Classroom	4		12x12	1W	1.00		7933	355				59.1 / 38.1		640		4.84		
	DH	Classroom	5		12x12	1W	1.00		8054	625				61.8 / 40.0		620		4.62		
		Office				SW	1.00													
		Media					1.00			145										
		Office				SW	1.00													
		Corridor				2W	1.00			150						180				
		<b>Total</b>														<b>2495</b>				
		<b>HP</b>																		
	R	Classroom	9		14x8	SW	0.58		2621	990	574	13.1		67.1 / 36.0						
	R	Classroom	10		14x8	SW	0.58		2806	850	493	10.5		67.2 / 34.3						

Ref. Note: ACH = Air Changes per Hour

AIR BALANCING SPECIALTY, INC. 3532 SE Milwaukie Avenue, Portland, OR 97202-2751 Phone 230-2332 Fax 230-2820

VARIABLE AIR VOLUME FPM

**AIR BALANCE DATA SHEET**

PROJECT NO. 20-4242-D

PROJECT: JOHN WETTEN ELEMENTARY SCHOOL - GLADSTONE, OREGON

DATE START: 12/01/20 FINISH: 12/15/20

SYSTEM: DOAS & HP

SECTION:

BY: DN

PAGE: 2 OF 25

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-112</b>	(1000 / 600 / 600)			(1000 CV)	(10"O)				100%			100%						
										(0.55)		(0.49)		(0.49)						
	DH	Classroom	6	1		4W	1.00				115		115		135					
	DH	Classroom	6	2		4W	1.00				235		235		275					
	DH	Classroom	6	3		4W	1.00				250		250		310					
	DH	Classroom	6	4		4W	1.00				250		250		295					
		<b>Total</b>									<b>850</b>		<b>850</b>		<b>1015</b>					
		(Display)									(815)		(851)		(964)					
		Temp / RH									64.9 / 35.5									
		Cubic Feet							9016											
		Air Changes per hour (ACH)													6.75					
		<b>WTU-113</b>	(1000 / 600 / 600)			(1000 CV)	(10"O)				100%		100%		100%					
										(0.56)		(0.59)		(0.59)						
	DH	Classroom	7	1		4W	1.00				175		175		215					
	DH	Classroom	7	2		4W	1.00				190		190		250					
	DH	Classroom	7	3		4W	1.00				170		170		235					
	DH	Classroom	7	4		4W	1.00				195		195		235					
		<b>Total</b>									<b>730</b>		<b>730</b>		<b>935</b>					
		(Display)									(591)		(731)		(905)					
		Temp / RH									64.9 / 35.5									
		Cubic Feet							8666											
		Air Changes per hour (ACH)													6.47					

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-110</b>	(1000 / 600 / 600)		(1000 CV)	(10"O)					(0.54)		(0.59)		76%					
	DH	Classroom	8	1		4W	1.00				230		230		240					
	DH	Classroom	8	2		4W	1.00				245		245		245					
	DH	Classroom	8	3		4W	1.00				250		250		245					
	DH	Classroom	8	4		4W	1.00				255		250		255					
		<b>Total</b>									<b>980</b>		<b>980</b>		<b>985</b>					
		(Display)									(932)		(979)		(996)					
		Temp / RH									66.3 / 34.9									
		Cubic Feet							9007											
		Air Changes per hour (ACH)													6.63					
		<b>WTU-19</b>	(1000 / 300 / 600)		(300 CV)	(10"O)					(0.55)		(0.70)							
	R	Counselor			20x6	SW	0.63				660	416	480	302						
		(Display)									(0)		(300)							
		Temp / RH																		
		Cubic Feet							2949											
		Air Changes per hour (ACH)									65.3 / 34.6									
													6.14							
		<b>WTU-111</b>	(1000 / 300 / 600)		(300 CV)	(8"O)					(0.54)		(0.45)							
	DH	Corridor					1.00				325		250							
	DH	Storage					1.00				65		50							
		<b>Total</b>									<b>390</b>		<b>300</b>							
		(Display)									(310)		(300)							

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-17</b>	(1000 / 400 / 600)	(900 CV)	(10"O)					100%	100%									
										(0.42)	(0.53)									
	DH	Staff Break		1		4W	1.00				240	240								
	DH	Staff Break		2		4W	1.00				240	240								
	DH	Corridor				4W	1.00				410	410								
		<b>Total</b>									<b>890</b>	<b>890</b>								
		(Display)									(690)	(890)								
		Temp / RH								65.3 / 33.7										
		Cubic Feet						4314												
		Air Changes per hour (ACH)											12.38							
										100%										
		<b>WTU-18</b>	(1000 / 400 / 600)	(350 CV)	(6"O)					(0.55)	(0.53)									
	DH	Staff Work		1		4W	1.00				205	205								
	DH	Staff Kitchen		2		4W	1.00				155	155								
		<b>Total</b>									<b>360</b>	<b>360</b>								
		(Display)									(372)	(355)								
		Temp / RH								64.4 / 35.1										
		Cubic Feet - Staff Work						1291												
		Air Changes per hour (ACH)											9.53							
		Cubic Feet - Staff Kitchen						1242												
		Air Changes per hour (ACH)											7.49							
										100%										
		<b>WTU-114</b>	(1000 / 300 / 600)	(600 CV)	(8"O)					(0.55)										
	DH	Entry				4W	1.00				700	600								
		(Display)									(550)	(590)								



Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-14</b>	(1000 / 400 / 600)	(450 CV)	(6"O)						100%									
											(0.55)	(0.53)								
	DH	Copy				4W	1.00				130	130								
	DH	Work Room				4W	1.00				170	170								
		<b>Total</b>									<b>300</b>	<b>300</b>								
		(Display)									(252)	(300)								
		Temp / RH									64.4 / 34.4									
		Cubic Feet - Copy							1193											
		Air Changes per hour (ACH)											6.54							
		Cubic Feet - Work Room							3194											
		Air Changes per hour (ACH)											3.19							
											100%	100%								
		<b>WTU-15</b>	(1000 / 400 / 600)	(400 CV)	(6"O)						(0.55)	(0.55)								
	DH	Health				4W	1.00				180	180								
	DH	Office				4W	1.00				205	205								
		<b>Total</b>									<b>385</b>	<b>385</b>								
		(Display)									(415)	(383)								
		Temp / RH									64.4 / 35.1									
		Cubic Feet - Health							1805											
		Air Changes per hour (ACH)											5.98							
		Temp / RH									66.3 / 32.8									
		Cubic Feet - Office							632											
		Air Changes per hour (ACH)											19.46							
											100%	100%								
		<b>WTU-16</b>	(400 / 100 / 400)	(400 CV)	(6"O)						(0.55)	(0.62)								
	DH	Office				4W	1.00				365	365								
		(Display)									(275)	(366)								
		Temp / RH									66.2 / 32.7									

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-13</b>	(1000 / 600 / 800)	(200CV)	(6"O)					(0.56)	(0.38)									
	DH	Conference				4W	1.00				220	205								
		(Display)									(205)	(205)								
		Temp / RH									67.2 / 31.8									
		Cubic Feet						1387												
		Air Changes per hour (ACH)										8.87								
										100%										
		<b>WTU-15</b>	(1000 / 400 / 600)	(1500 CV)	(14"O)					(0.55)	(0.93)									
	DH	Library	1	20x6	SW		1.00				495	320								
	DH	Library	2	20x6	SW		1.00				485	310								
	DH	Library	3	20x6	SW		1.00				450	290								
	DH	Library	4	20x6	SW		1.00				475	305								
	DH	Library	5	20x6	4W		1.00				280	190								
	DH	Library	6	20x6	4W		1.00				140	145								
		<b>Total</b>									<b>2325</b>	<b>1560</b>								
		(Display)									(1163)	(1560)								
		Temp / RH									65.6 / 34.1									
		Cubic Feet						29480												
		Air Changes per hour (ACH)										6.35								
		<b>WTU-16</b>	(1000 / 400 / 600)	(1500 CV)	(14"O)					(0.55)	(0.32)									
	DH	Library	1	20x6	SW		1.00				345	385								
	DH	Library	2	20x6	SW		1.00				320	355								
	DH	Library	3	20x6	SW		1.00				335	360								
	DH	Library	4	20x6	SW		1.00				355	370								
		<b>Total</b>									<b>1355</b>	<b>1470</b>								
		(Display)									(1480)	(1487)								
		Temp / RH									65.6 / 34.1									
		Cubic Feet						14740												
		Air Changes per hour (ACH)										5.98								

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-11</b>	(1000 / 300 / 600)		(425 CV)	(8"O)					100%									
											(0.54)		(0.50)							
	DH	Office		1		4W		1.00				305		280						
	DH	Corridor		2		4W		1.00				175		160						
		<b>Total</b>										<b>480</b>		<b>440</b>						
		(Display)										(300)		(476)						
		Temp / RH										67.1 / 33.0								
		Cubic Feet							2439											
		Air Changes per hour (ACH)													6.69					
		<b>WTU-12</b>	(1000 / 300 / 600)		(475 CV)	(8"O)						100%								
											(0.54)		(0.47)							
	DH	Principal				4W		1.00				85		115		115				
	DH	Corridor				4W		1.00				230		290		295				
	DH	Main Office				4W		1.00						60		64				
		<b>Total</b>										<b>315</b>		<b>465</b>		<b>474</b>				
		(Display)										(406)		(473)		(504)				
		Temp / RH										70.7 / 30.1								
		Cubic Feet							1597											
		Air Changes per hour (ACH)													4.83					

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-221</b>	(1400 / 800 / 800)			(900 CV)	(12"O)				100%									
										(0.55)		(0.56)								
	DH	Computer	12	1		4W	1.00				265		225							
	DH	Computer	12	2		4W	1.00				260		235							
	DH	Computer	12	3		4W	1.00				260		225							
	DH	Computer	12	4		4W	1.00				280		235							
		<b>Total</b>									<b>1065</b>		<b>920</b>							
		(Display)									(880)		(926)							
		Temp / RH									63.5 / 31.0									
		Cubic Feet							8771											
		Air Changes per hour (ACH)											6.29							
		<b>WTU-220</b>	(1000 / 400 / 700)			(900 CV)	(10"O)				(0.56)									
	DH	Classroom	13	1		4W	1.00				225									
	DH	Classroom	13	2		4W	1.00				225									
	DH	Classroom	13	3		4W	1.00				225									
	DH	Classroom	13	4		4W	1.00				215									
		<b>Total</b>									<b>890</b>									
		(Display)									(885)									
		Temp / RH									65.3 / 27.0									
		Cubic Feet							8771											
		Air Changes per hour (ACH)											6.08							

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-219</b>	(1400 / 800 / 800)	(900 CV)	(12"O)						100%									
											(0.55)	(0.64)								
	DH	Classroom	14	1		4W	1.00				225	235								
	DH	Classroom	14	2		4W	1.00				250	250								
	DH	Classroom	14	3		4W	1.00				230	230								
	DH	Classroom	14	4		4W	1.00				215	220								
		<b>Total</b>									<b>920</b>	<b>935</b>								
		(Display)									(667)	(915)								
		Temp / RH									66.0 / 26.2									
		Cubic Feet						8771												
		Air Changes per hour (ACH)										6.40								
		<b>WTU-222</b>	(1000 / 300 / 600)	(600 CV)	(10"O)						(0.55)	(0.58)								
	DH	Corridor				4W	1.00				360	315								
	DH	Corridor				4W	1.00				360	310								
		<b>Total</b>									<b>720</b>	<b>625</b>								
		(Display)									(588)	(615)								
		Temp / RH									65.4 / 26.1									

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-218</b>	(1000 / 600 / 700)			(900 CV)	(10"O)				100%									
										(0.55)		(0.60)								
	DH	Classroom	15	1		4W	1.00				265		215							
	DH	Classroom	15	2		4W	1.00				275		240							
	DH	Classroom	15	3		4W	1.00				295		255							
	DH	Classroom	15	4		4W	1.00				260		225							
		<b>Total</b>									<b>1095</b>		<b>935</b>							
		(Display)									(665)		(915)							
		Temp / RH									66.7 / 24.0									
		Cubic Feet							8874											
		Air Changes per hour (ACH)											6.32							
		<b>WTU-217</b>	(1000 / 800 / 800)			(900 CV)	(10"O)				(0.54)		(0.56)							
	DH	Classroom	16A	1		4W	1.00				250		230							
	DH	Classroom	16A	2		4W	1.00				235		215							
	DH	Classroom	16A	3		4W	1.00				235		215							
	DH	Classroom	16A	4		4W	1.00				290		265							
		<b>Total</b>									<b>1010</b>		<b>925</b>							
		(Display)									(860)		(915)							
		Temp / RH									68.0 / 23.5									
		Cubic Feet							8867											
		Air Changes per hour (ACH)											6.26							

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-216</b>	(1000 / 400 / 600)			(900 CV)	(10"O)				(0.54)	(0.69)								
	DH	Classroom	16B	1		4W	1.00				285	225								
	DH	Classroom	16B	2		4W	1.00				270	215								
	DH	Classroom	16B	3		4W	1.00				275	215								
	DH	Classroom	16B	4		4W	1.00				275	225								
		<b>Total</b>									<b>1105</b>	<b>880</b>								
		(Display)									(880)	(885)								
		Temp / RH									68.0 / 22.4									
		Cubic Feet							8835											
		Air Changes per hour (ACH)											5.98							
1		Room Return											100							
		<b>WTU-215</b>	(1000 / 300 / 600)			(400 CV)	(6"O)				(0.55)	(0.70)								
	DH	Corridor		1		4W	1.00				315	255								
	DH	Copy		2		4W	1.00				185	155								
		<b>Total</b>									<b>500</b>	<b>410</b>								
		(Display)									(385)	(404)								
		Temp / RH									NA									
		Cubic Feet							728											
		Air Changes per hour (ACH)											12.77							

Ref. Note: (1) We could not find a FSD or access to one. We assume there is one, just no access.

AIR BALANCING SPECIALTY, INC. 3532 SE Milwaukie Avenue, Portland, OR 97202-2751

Phone 230-2332 Fax 230-2820

VARIABLE AIR VOLUME FPM

**AIR BALANCE DATA SHEET**

PROJECT NO. 20-4242-D

PROJECT: JOHN WETTEN ELEMENTARY SCHOOL - GLADSTONE, OREGON

DATE START: 12/01/20 FINISH: 12/15/20

SYSTEM: VAV System - ASU-2 (WTU-216 & WTU-215)

SECTION:

BY: DN

PAGE: 12 OF 25

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-214</b>	(1000 / 600 / 600)(900 CV)(10"O)								(0.55)	(0.56)								
	DH	Classroom	18	1		4W	1.00				215	210								
	DH	Classroom	18	2		4W	1.00				245	235								
	DH	Classroom	18	3		4W	1.00				235	235								
	DH	Classroom	18	4		4W	1.00				230	230								
		<b>Total</b>									<b>925</b>	<b>910</b>								
		(Display)									(890)	(902)								
		Temp / RH									68.3 / 24.7									
		Cubic Feet							8600											
		Air Changes per hour (ACH)											6.35							
		<b>WTU-213</b>	(1000 / 600 / 600)(900 CV)(10"O)								(0.54)	(0.56)								
	DH	Classroom	20	1		4W	1.00				250	230								
	DH	Classroom	20	2		4W	1.00				235	215								
	DH	Classroom	20	3		4W	1.00				235	215								
	DH	Classroom	20	4		4W	1.00				290	265								
		<b>Total</b>									<b>1010</b>	<b>925</b>								
		(Display)									(860)	(915)								
		Temp / RH																		
		Cubic Feet							8696											
		Air Changes per hour (ACH)											6.38							



Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-212</b>	(1000 / 300 / 600)			(400 CV)	(6"O)				(0.54)	(0.72)								
	DH	Corridor				SW	1.00				415	325								
	DH	Storage				1W	1.00				85	70								
		<b>Total</b>									<b>500</b>	<b>395</b>								
		(Display)									(390)	(400)								
		Temp / RH									68.5 / 24.4									
		Cubic Feet																		
		Air Changes per hour (ACH)																		
											100%									
		<b>WTU-211</b>	(1500 / 500 / 1000)			(900 CV)	(10"O)				(0.56)	(0.58)								
	DH	Classroom	17	1		4W	1.00				255	235								
	DH	Classroom	17	2		4W	1.00				245	220								
	DH	Classroom	17	3		4W	1.00				260	245								
	DH	Classroom	17	4		4W	1.00				255	230								
		<b>Total</b>									<b>1015</b>	<b>930</b>								
		(Display)									(790)	(913)								
		Temp / RH									68.3 / 23.7									
		Cubic Feet							8870											
		Air Changes per hour (ACH)												6.29						

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-210</b>	(1000 / 300 / 600)(900 CV)(10"O)								(0.54)	(0.71)								
	DH	Classroom		1		4W	1.00				275	230								
	DH	Classroom		2		4W	1.00				270	230								
	DH	Classroom		3		4W	1.00				290	235								
	DH	Classroom		4		4W	1.00				290	235								
		<b>Total</b>									<b>1125</b>	<b>930</b>								
		(Display)									(892)	(906)								
		Temp / RH									68.0 / 25.0									
		Cubic Feet							8739											
		Air Changes per hour (ACH)											6.39							
		<b>WTU-25</b>	(1000 / 600 / 600)(900 CV)(10"O)								(0.55)	(0.60)								
	DH	Classroom	21A	1		4W	1.00				255	235								
	DH	Classroom	21A	2		4W	1.00				280	260								
	DH	Classroom	21A	3		4W	1.00				210	190								
	DH	Classroom	21A	4		4W	1.00				235	220								
		<b>Total</b>									<b>980</b>	<b>905</b>								
		(Display)									(902)	(896)								
		Temp / RH									67.4 / 23.7									
		Cubic Feet							8655											
		Air Changes per hour (ACH)											6.27							

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-21</b>	(1000 / 600 / 800)(900 CV)(10"O)								(0.55)									
	DH	Classroom	21B	1		4W	1.00					210								
	DH	Classroom	21B	2		4W	1.00					225								
	DH	Classroom	21B	3		4W	1.00					230								
	DH	Classroom	21B	4		4W	1.00					215								
		<b>Total</b>										<b>880</b>								
		(Display)										(890)								
		Temp / RH									64.0 / 25.5									
		Cubic Feet						8921												
		Air Changes per hour (ACH)										5.92								
		<b>WTU-22</b>	(1400 / 500 / 900)(800 CV)(12"O)								(0.54)		(0.39)							
	DH	Classroom	22	1		4W	1.00					235	215							
	DH	Classroom	22	2		4W	1.00					230	210							
	DH	Classroom	22	3		4W	1.00					200	185							
	DH	Classroom	22	4		4W	1.00					225	205							
		<b>Total</b>										<b>890</b>	<b>815</b>							
		(Display)										(800)	(807)							
		Temp / RH									64.9 / 27.0									
		Cubic Feet						7084												
		Air Changes per hour (ACH)											6.90							

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b> (Box Inlet Size)													
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-23</b>	(1400 / 800 / 800)		(800 CV)	(12"O)				(0.55)		(0.42)								
	DH	Classroom	23	1		4W	1.00				250		200							
	DH	Classroom	23	2		4W	1.00				250		200							
	DH	Classroom	23	3		4W	1.00				250		200							
	DH	Classroom	23	4		4W	1.00				255		205							
		<b>Total</b>									<b>1005</b>		<b>805</b>							
		(Display)									(809)		(815)							
		Temp / RH								66.5 / 24.0										
		Cubic Feet						7121												
		Air Changes per hour (ACH)											6.78							
		<b>WTU-223</b>	(1000 / 300 / 600)		(800 CV)	(10"O)				(0.55)		(0.56)								
	DH	Corridor				4W	1.00				310		275							
	DH	Corridor				4W	1.00				250		220							
	DH	Boys				4W	1.00				155		120							
	DH	Girls				4W	1.00				205		175							
		<b>Total</b>									<b>920</b>		<b>790</b>							
		(Display)									(785)		(796)							
		Temp / RH																		
		Cubic Feet																		
		Air Changes per hour (ACH)																		
		<b>WTU-224</b>	(1000 / 600 / 800)		(400 CV)	(6"O)				(0.54)		(0.83)								
	R	Storage			12x8	SW	0.50			1000	500	810	405							
		Corridor									0		0							
		<b>Total</b>									<b>500</b>		<b>405</b>							
		(Display)											(401)							

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-26</b>	(1000 / 600 / 800)(900 CV)(10"O)								(0.55)	(0.68)								
	DH	Classroom	25	1		4W	1.00				265	225								
	DH	Classroom	25	2		4W	1.00				280	230								
	DH	Classroom	25	3		4W	1.00				255	215								
	DH	Classroom	25	4		4W	1.00				295	245								
		<b>Total</b>									<b>1095</b>	<b>915</b>								
		(Display)									(889)	(909)								
		Temp / RH									66.9 / 25.1									
		Cubic Feet							8868											
		Air Changes per hour (ACH)											6.19							
											100%									
		<b>WTU-27</b>	(1400 / 1000 / 1000)(900 CV)(10"O)								(0.55)	(0.61)								
	DH	Classroom	27	1		4W	1.00				255	240								
	DH	Classroom	27	2		4W	1.00				230	210								
	DH	Classroom	27	3		4W	1.00				230	225								
	DH	Classroom	27	4		4W	1.00				250	255								
		<b>Total</b>									<b>965</b>	<b>930</b>								
		(Display)									(716)	(911)								
		Temp / RH									64.9 / 27.0									
		Cubic Feet							8868											
		Air Changes per hour (ACH)											6.29							

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
		<b>VAV System</b>									(Flow Coefficient)									
		<b>WTU-28</b>	(1400 / 850 / 850)	(900 CV)	(10"O)						100%									
											(0.55)	(0.74)								
	DH	Classroom	29	1		4W	1.00				235	230								
	DH	Classroom	29	2		4W	1.00				240	230								
	DH	Classroom	29	3		4W	1.00				235	225								
	DH	Classroom	29	4		4W	1.00				230	225								
		<b>Total</b>									<b>940</b>	<b>910</b>								
		(Display)									(603)	(904)								
		Temp / RH									66.7 / 23.7									
		Cubic Feet						8868												
		Air Changes per hour (ACH)											6.16							
		<b>WTU-29</b>	(500 / 200 / 500)	(600 CV)	(10"O)						(0.56)	(0.26)								
	DH	Corridor				4W	1.00				215	340								
	DH	Corridor				4W	1.00					150								
		<b>Total</b>									<b>215</b>	<b>490</b>								
		(Display)									(300)	(322)								
		Temp / RH																		
		Cubic Feet																		
		Air Changes per hour (ACH)																		

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
											(Flow Coefficient)									
		<b>WTU-0708</b>	(1000 / 700 / 700)(800 CV)(8"O)								100%									
										(0.42)	(0.71)	(0.52)								
	DH	Classroom	24	1		4W	1.00			255	225	215								
	DH	Classroom	24	2		4W	1.00			255	225	220								
	DH	Classroom	24	3		4W	1.00			255	220	215								
	DH	Classroom	24	4		4W	1.00			245	215	205								
		<b>Total</b>								<b>1010</b>	<b>885</b>	<b>855</b>								
		(Display)								(483)	(809)	(822)								
		Temp / RH								71.2 / 20.5										
		Cubic Feet						7148												
		Air Changes per hour (ACH)											7.26							
										100%	62%	54%	52%							
		<b>WTU-0707</b>	(1000 / 700 / 700)(800 CV)(12"O)																	
	DH	Classroom	26	1		4W	1.00			260	215	210	200							
	DH	Classroom	26	2		4W	1.00			265	250	230	210							
	DH	Classroom	26	3		4W	1.00			280	240	225	215							
	DH	Classroom	26	4		4W	1.00			270	230	220	210							
		<b>Total</b>								<b>1075</b>	<b>935</b>	<b>885</b>	<b>835</b>							
		(Display)								(650)	(805)	(796)	(802)							
		Temp / RH								63.3 / 44.7										
		Cubic Feet						7148												
		Air Changes per hour (ACH)											7.01							

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
											(Flow Coefficient)									
		<b>WTU-0706</b>	(1000 / 700 / 700)	(800 CV)	(10"O)						100%	55%	49%	46%						
	DH	Classroom	28	1		4W	1.00				275	245	235	225						
	DH	Classroom	28	2		4W	1.00				265	240	220	215						
	DH	Classroom	28	3		4W	1.00				270	255	225	220						
	DH	Classroom	28	4		4W	1.00				285	260	245	235						
		<b>Total</b>									<b>1095</b>	<b>1000</b>	<b>925</b>	<b>895</b>						
		(Display)									(627)	(792)	(802)	(807)						
		Temp / RH									67.1 / 41.0									
		Cubic Feet							7062											
		Air Changes per hour (ACH)															7.60			
		<b>WTU-0705</b>	(1000 / 700 / 700)	(800 CV)	(10"O)						100%	100%	35%							
3	DH	Classroom	30	1		4W	1.00				155	150	195							
	DH	Classroom	30	2		4W	1.00				185	180	180							
3	DH	Classroom	30	3		4W	1.00				185	180	220							
	DH	Classroom	30	4		4W	1.00				150	150	220							
		<b>Total</b>									<b>675</b>	<b>660</b>	<b>815</b>							
		(Display)									(514)	(673)	(804)							
		Temp / RH									68.7 / 38.7									
		Cubic Feet							7148											
		Air Changes per hour (ACH)															6.84			

Ref. Note: (3) Branch damper was closed test # 1 & # 2.



Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
											(Flow Coefficient)									
		<b>WTU-0704</b>	(1000 / 800 / 800)	(800 CV)	(10"O)						100%	73%	40%	27%						
3	DH	Classroom	31	1		4W	1.00				160	310	220	210						
	DH	Classroom	31	2		4W	1.00				180	305	240	220						
3	DH	Classroom	31	3		4W	1.00				175	325	210	200						
	DH	Classroom	31	4		4W	1.00				155	315	215	210						
		<b>Total</b>									<b>670</b>	<b>1255</b>	<b>885</b>	<b>840</b>						
		(Display)									(446)	(822)	(813)	(807)						
		Temp / RH									67.2 / 45.4									
		Cubic Feet							7062											
		Air Changes per hour (ACH)																7.13		
											57%	49%								
		<b>WTU-0703</b>	(1000 / 700 / 700)	(800 CV)	(10"O)															
	DH	Classroom / Music	32	1		4W	1.00				255	210								
	DH	Classroom / Music	32	2		4W	1.00				225	190								
	DH	Classroom / Music	32	3		4W	1.00				240	200								
	DH	Classroom / Music	32	4		4W	1.00				250	215								
		<b>Total</b>									<b>970</b>	<b>815</b>								
		(Display)									(779)	(6.84)								
		Temp / RH									68.0 / 44.2									
		Cubic Feet							7148											
		Air Changes per hour (ACH)											6.84							

Ref. Note: (3) Branch damper was closed test # 1 & # 2.

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>			(Box Inlet Size)										
											(Flow Coefficient)									
		<b>WTU-0702</b>	(1000 / 700 / 700)(800 CV)(10"O)								100%	52%								
	DH	Classroom	33	1		4W	1.00				235	205								
	DH	Classroom	33	2		4W	1.00				245	215								
	DH	Classroom	33	3		4W	1.00				240	195								
	DH	Classroom	33	4		4W	1.00				205	180								
		<b>Total</b>									<b>925</b>	<b>795</b>								
		(Display)									(430)	(817)								
		Temp / RH									68.0 / 44.5									
		Cubic Feet							7062											
		Air Changes per hour (ACH)											6.75							
											58%	51%								
		<b>WTU-0701</b>	(1000 / 700 / 700)(800 CV)(10"O)																	
	DH	Classroom	34	1		4W	1.00				250	220								
	DH	Classroom	34	2		4W	1.00				225	205								
	DH	Classroom	34	3		4W	1.00				230	210								
	DH	Classroom	34	4		4W	1.00				220	195								
		<b>Total</b>									<b>925</b>	<b>830</b>								
		(Display)									(783)	(805)								
		Temp / RH									67.4 / 44.1									
		Cubic Feet							7148											
		Air Changes per hour (ACH)											6.97							

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
			(As Found Setpoints - Max. / Min. / Htg.)				<b>(New Setpoint)</b>													
											(Flow Coefficient)									
		<b>WTU-0709</b>	(900 / 700 / 700)	(700 CV)	(10"O)					42%	40%									
	DH	Corridor				4W	1.00				700	625								
	DH	Gym Office			6"O	4W	1.00				25	100								
		<b>Total</b>									<b>725</b>	<b>725</b>								
		(Display)									(684)	(718)								
		Temp / RH																		
		Cubic Feet																		
		Air Changes per hour (ACH)																		
		<b>WTU-0710</b>	(600 / 400 / 400)	(5"O)																

Ref	Ins	AREA SERVED	OUTLETS			Blow	DESIGN			TEST #1		TEST #2		TEST #3		TEST #4		FINAL		Pct
			Rm.#	No.	Size		AK	Vel	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	FPM	CFM	
		<b>ASU-03</b>	(Trane)																	
		Cafeteria																		
	DG	OSA @ 100%			35x24		6.02			528	3179									
		Cubic Feet							62870											
		Air Changes per hour (ACH)									3.03									
		<b>AHU-0702</b>	(Trane)																	
		Gym																		
	DG	OSA @ 100%			62x38		15.54			536	8329									
		Cubic Feet							102400											
		Air Changes per hour (ACH)									4.88									