

KISBY SHORE MECHANICAL**SUBMITTAL**

No. 21

610 N. NEW JERSEY AVENUE
ATLANTIC CITY, NJ 08401Phone: (609) 345-3264
Fax: (609) 344-2676**PROJECT:** Marlton Middle School HVAC Upgrade**DATE:** 12/16/2015**TITLE:** Balancing Report**JOB:** 1991**TO:** EMC Consulting Engineers, Inc
2180 Waterview Drive #937
N. Myrtle Beach, SC 29582
Phone: 843-390-5766 Fax: 843-390-5767**CONTRACT/PO:** 1991**DIVISION:** 15000**TRADE:** HVAC**ATTN:** John Allan**SECTION:** 15660**RE-SUBMITTAL:** ☐

☐ Shop Drawings ☐ Letter ☐ Prints ☐ Plans	☐ Samples ☐ Specifications ☒ Other: Balancing Report ☐ Other:
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COPIES	SECTION	DESCRIPTION
1	15660	Balancing Report

REMARKS:

Formal Typed, Revised Balancing Report with sheeve pages extrapolated.

For Your Use

M-37

SUBMISSION ☐ 1st ☒ 2nd ☐ 3rd	
JOB NO. 2013-H	
Checking is only for conformance with the design concept of the project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction, and for coordination of the work of all trades.	
☒ REVIEWED ☐ REVIEWED AS NOTED ☐ RESUBMIT	
DATE 12/16/15 BY JA	
EMC CONSULTING ENGINEERS, INC.	

Signed:

Dan Kane

Date:

12/16/2015

NEBB
CERTIFIED TEST, ADJUST, AND
BALANCE REPORT

DATE 9/3/2015
REVISED 12/3/15

PROJECT MARLTON MIDDLE SCHOOL

ADDRESS 150 TOMLINSON MILL ROAD

MARLTON, NJ

ARCHITECT WAYNE ALLAN NEVILLE

WEST BERLIN, NJ

ENGINEER EMC CONSULTING ENGINEERS

N.MYRTLE BEACH, S.C.

HVAC CONTRACTOR KJSBY MECHANICAL

ATLANTIC CITY, NJ

NEBB TAB FIRM Air Systems Inc.

ADDRESS 1 Pommel Court

Mount Laurel, NJ 08054

NEBB

CERTIFICATION

PROJECT Marlton Middle School

ADDRESS 150 Tomlinson Mill Road

Marlton, NJ

THE DATA PRESENTED IN THIS REPORT IS AN EXACT RECORD OF SYSTEM PERFORMANCE AND WAS OBTAINED IN ACCORDANCE WITH NEBB STANDARD PROCEDURES. ANY VARIANCES FROM DESIGN QUANTITIES WHICH EXCEED NEBB TOLERANCES ARE NOTED THROUGHOUT THIS REPORT.

THE AIR DISTRIBUTION SYSTEMS HAVE BEEN TESTED & BALANCED AND FINAL ADJUSTMENTS HAVE BEEN MADE IN ACCORDANCE WITH NEBB "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, BALANCING OF ENVIRONMENTAL SYSTEMS" AND THE PROJECT SPECIFICATIONS.

NEBB TAB FIRM Air Systems, Inc.

REG. NO. 2311 CERTIFIED BY Robert Ruger DATE 12/6/15

THE HYDRONIC DISTRIBUTION SYSTEMS HAVE BEEN TESTED & BALANCED AND FINAL ADJUSTMENTS HAVE BEEN MADE IN ACCORDANCE WITH NEBB "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, BALANCING OF ENVIRONMENTAL SYSTEMS" AND THE PROJECT SPECIFICATIONS.

NEBB TAB FIRM Air Systems, Inc.

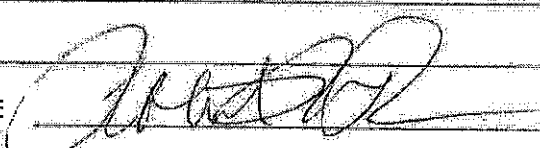
REG. NO. 2311 CERTIFIED BY Robert Ruger DATE 12/6/15

SUBMITTED & CERTIFIED BY:

NEBB TAB FIRM Air Systems, Inc.

TAB SUPERVISOR Robert Ruger

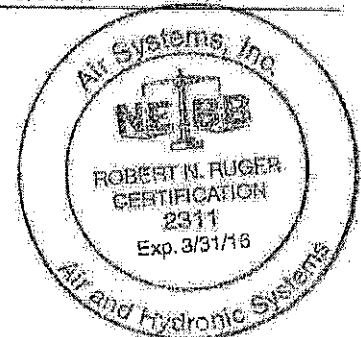
REG. NO. 2311

SIGNATURE 

DATE 12/6/15

CERTIFICATION EXPIRATION DATE

3/31/16



Project MARLTON MIDDLE SCHOOL

FAN DATA	FAN NO. HRV-A SUP		FAN NO. HRV-A EXH		FAN NO.	
Location	ROOF		ROOF			
Service	A WING		A WING			
Manufacturer	GREENHECK		GREENHECK			
Model Number	ERT90-30L		ERT90-30L			
Serial Number	14187643-156		14187643-56			
Type/Class	CENT		CENT			
Motor Make/Style	BALDOR		BALDOR			
Motor H.P./RPM/Frame	7.5/1770/213T		3/1765/182T			
Volts/Phase/Hertz	460/3/60		460/3/60			
F.L. Amps/S.F.	9.7/1.15		4.2/1.15			
Motor Sheave Make/Model	WOODS		POWER DRIVE			
Motor Sheave Diam./Bore	1VP75/ 1 3/8		1VP50/1 1/8"			
Fan Sheave Make	POWER DRIVE		POWER DRIVE			
Fan Sheave Diam./Bore	7 3/16" / 1 3/8"		1VP50/1 1/8"			
No. Belts/Make/Size	1/BX74		1/AX70			
Sheave Distance	27 1/4"		27 1/4"			
MOTOR SHEAVE POS	MAX		MAX			
TEST DATA	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
CFM	6810	6646(1)	5230	5154 (2)		
Fan RPM	1433	1700	1560	1350		
S.P. In/Out		-1.8/58		-1.05/20		
Total S.P.	2.06	2.38	.607	1.25		
Voltage	460	478	460	478		
Amperage	9.7	7.5/7.8/7.2	4.2	3.5/3.7/3.7		

Remarks:

(1) TOTAL CFM AT TRAVERSE 1 TO 3 AND RMS 122 & 172

(2) TOTAL CFM AT TRAVERSE 1 AND 4

Test Date 9/4/2015Readings By DT

Page

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-A SUPPLYLocation / Zone A WING/T-1Actual Air Temp. _____ Duct S. P. 0.07

DUCT			REQUIRED			ACTUAL					
SIZE	20X10	AREA	1.38	FPM	909	CFM	1255	FPM	896	CFM	1236

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	750	912	1026												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOM 119 TO 121

Test Date 9/29/2015Readings By DTPage 2 of 2

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-A SUPPLYLocation / Zone A WING/T-2Actual Air Temp. Duct S. P. 0.19

DUCT			REQUIRED			ACTUAL					
SIZE	18X14	AREA	1.75	FPM	1200	CFM	2100	FPM	1149	CFM	2011

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1156	1197	1095												
2	1213	1213	1094												
3	1095	1251	1029												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOM 100 TO 105.

Test Date 9/29/2015Readings By DTPage 3 of

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORT

Project MARLTON MIDDLE SCHOOL

System Unit HRV-A SUPPLY

Location / Zone A WING/T-3

Actual Air Temp. _____ Duct S. P. 0.19

DUCT		REQUIRED		ACTUAL	
SIZE	<u>26X14</u>	AREA	<u>2.52</u>	FPM	<u>1232</u>
				CFM	<u>3105</u>
				FPM	<u>1210</u>
				CFM	<u>3049</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1084	1275	1242	1232											
2	1032	1159	1298	1362											
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOMS 127 TO 134 AND 136

Test Date 9/29/2015

Readings By DT

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-A SUPPLYLocation / Zone A WING/T-4Actual Air Temp. _____ Duct S. P. 0.08

DUCT			REQUIRED			ACTUAL					
SIZE	<u>20X10</u>	AREA	<u>2.52</u>	FPM	<u>498</u>	CFM	<u>1255</u>	FPM	<u>930</u>	CFM	<u>1283</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	981	860	951												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOM 127 TO 129

Test Date 9/29/2015Readings By DTPage 5 of

AIR OUTLET TEST REPORT

System HRV A SUPPLY

Test Apparatus AIRFOIL

[illegible]

Remarks

Readings By DT
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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-A EXHAUSTLocation / Zone ROOF/T-1Actual Air Temp. _____ Duct S. P. -0.21

DUCT			REQUIRED			ACTUAL					
SIZE	18X14	AREA	1.75	FPM	934	CFM	1635	FPM	847	CFM	1482

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	776	891	751												
2	878	880	949												
3	771	834	899												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES NEW PLENUM EXHAUST, OLD EF 1 & 3

Test Date 9/29/2015Readings By DTPage 7 of

NEBB

RECTANGULAR DUCT PITOT TUBE TEST REPORT

Project MARLTON MIDDLE SCHOOL

System Unit HRV A-EXHAUST

Location / Zone ROOF/T-2

Actual Air Temp. Duct S. P. -0.16

DUCT		REQUIRED				ACTUAL					
SIZE	<u>14X12</u>	AREA	<u>1.16</u>	FPM	<u>633</u>	CFM	<u>735</u>	FPM	<u>570</u>	CFM	<u>661</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	551	600	705												
2	481	487	688												
3	459	552	617												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES NEW PLENUM EXHAUST

Test Date 9/29/2015

Readings By DT

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV A-EXHAUSTLocation / Zone ROOF/T-3Actual Air Temp. _____ Duct S. P. -0.10

DUCT			REQUIRED			ACTUAL					
SIZE	<u>12X8</u>	AREA	<u>0.66</u>	FPM	<u>682</u>	CFM	<u>450</u>	FPM	<u>623</u>	CFM	<u>411</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	584	553													
2	665	690													
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF-1

Test Date 9/29/2015Readings By DTPage 9 of

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV A-EXHAUSTLocation / Zone ROOF/ T-4Actual Air Temp. Duct S. P. -0.75

DUCT		REQUIRED		ACTUAL	
SIZE <u>26X18</u>	AREA <u>3.25</u>	FPM <u>1121</u>	CFM <u>3645</u>	FPM <u>1130</u>	CFM <u>3672</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1021	1159	1224	1174											
2	1142	1092	1122	1194											
3	1073	1022	1122	1223											
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES THE OLD EF 5 & 11

Test Date 9/29/2015Readings By DTPage 10 of

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV A-EXHAUSTLocation / Zone ROOF/T-5Actual Air Temp. _____ Duct S. P. -0.67

DUCT			REQUIRED			ACTUAL					
SIZE	<u>16X16</u>	AREA	<u>1.77</u>	FPM	<u>858</u>	CFM	<u>1520</u>	FPM	<u>801</u>	CFM	<u>1417</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	763	714	803												
2	870	948	804												
3	679	853	781												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES THE OLD EF 11

Test Date 9/29/2015Readings By DTPage 11 of 11

AIR OUTLET TEST REPORT

System HRV A- EXHAUST

Test Apparatus FLOWHOOD

[illegible]

Remarks:

BASED TRAVERSES T1, T2, AND T3

Test Date 9/29/2015

Readings By _____ DT _____
Page 12 of _____

Project MARLTON MIDDLE SCHOOL

FAN DATA	FAN NO. HRV-BSUP	FAN NO. HRV-B EXH	FAN NO.			
Location	ROOF	ROOF				
Service	B-WING	B-WING				
Manufacturer	GREENHECK	GREENHECK				
Model Number	ERT90-30L	ERT90-30L				
Serial Number	14187645-156	14187645-156				
Type/Class	CENT	CENT				
Motor Make/Style	BALDOR	BALDOR				
Motor H.P./RPM/Frame	7.5/1770/213T	3/1765/182T				
Volts/Phase/Hertz	460/3/60	460/3/60				
F.L. Amps/S.F.	9.7/1.15	4.2/1.15				
Motor Sheave Make/Model	WOODS	POWER DRIVE				
Motor Sheave Diam./Bore	1VP75/ 1 3/8	1VP50/1 1/8"				
Fan Sheave Make	POWER DRIVE	POWER DRIVE				
Fan Sheave Diam./Bore	7 3/16" / 1 3/16"	5 11/16" / 1 3/16"				
No. Belts/Make/Size	1/BX74	1/AX70				
Sheave Distance	27 1/4"	28 1/4"				
MOTOR SHEAVE POSITION	MAX	75% CLOSED				
TEST DATA	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
CFM	6800	6764 (2)	5090	4975 (1)		
Fan RPM	1433	1700	1509	1380		
S.P. In/Out		-2.00/ .53		-1.28/ .21		
Total S.P.	2.06	2.53	.67	1.49		
Voltage	460	477	460	477		
Amperage	9.7	7.6/7.3/6.6	4.2	4.0/4.2/4.2		

Remarks:

- (1) TOTAL CFM AT TRAVERSE 1 & 2
 (2) TOTAL CFM AT T4 TRAVERSES AND OUTLETS 13 & 14

Test Date 9/30/2015

REVISED 12/3/15

Readings By DT

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-B SUPPLYLocation / Zone BWING/T-1Actual Air Temp. _____ Duct S. P. 0.03

DUCT			REQUIRED			ACTUAL					
SIZE	20X10	AREA	1.38	FPM	909	CFM	1255	FPM	950	CFM	1311

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	958	885	1007												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) DAMPER FOR THIS BRANCH DUCT IS BROKEN. DAMPER BLADE WAS FOUND LAYING IN BOTTOM OF DUCT. BLADE WAS WEDGED INTO PLACE TO ACHIEVE DESIGN FLOW.

IT IS RECOMMENDED IT BE REPLACED BECAUSE IT MAY VIBRATE LOOSE AND FALL OUT OF POSITION.

(2) TRAVERSE SERVES ROOMS 220 TO 222

Test Date 9/29/2015Readings By DTPage 14 of

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-B SUPPLYLocation / Zone BWING/T-2Actual Air Temp. _____ Duct S. P. 0.035

DUCT		REQUIRED		ACTUAL	
SIZE <u>24X10</u>	AREA <u>1.66</u>	FPM <u>1265</u>	CFM <u>2100</u>	FPM <u>1260</u>	CFM <u>2091</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1208	1242	1279	1311											
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOMS 223 TO 228

Test Date 9/30/2015Readings By DTPage 15 of

NEBB

RECTANGULAR DUCT PITOT TUBE TEST REPORT

Project MARLTON MIDDLE SCHOOL

System Unit HRV-B SUPPLY

Location / Zone BWING/T-3

Actual Air Temp. Duct S. P. 0.052

DUCT			REQUIRED			ACTUAL					
SIZE	20X10	AREA	1.38	FPM	909	CFM	1255	FPM	849	CFM	1171

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	850	847	850												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOMS 217 TO 219

Test Date 9/30/2015

Readings By DT

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORT

Project MARLTON MIDDLE SCHOOL
Location / Zone BWING/T-4

System Unit HRV-B SUPPLY
Actual Air Temp. Duct S. P. 0.16

DUCT			REQUIRED			ACTUAL					
SIZE	20X10	AREA	1.38	FPM	1340	CFM	1850	FPM	1356	CFM	1871

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1338	1402	1330												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

Test Date 9/30/2015

Readings By DT

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NEBB

AIR OUTLET TEST REPORT

Project MARLTON M.S.System HRV-B SUPPLY

Outlet Manufacturer _____

Test Apparatus AIR FOIL

AREA SERVED	OUTLET				DESIGN		PRELIMINARY				FINAL		REMARKS
	NO.	TYPE	SIZE	AK	VEL	CFM	VEL or CFM	VEL or CFM			VEL	CFM	
220	1	OED	12X6			350						360	
221	2	OED	12X6			350						360	
222	3	OED	20X10			350						565	
223	4	OED	20X10			350						335	
224	5	OED	12X6			350						335	
225	6	OED	12X6			350						340	
226	7	OED	12X6			350						340	
227	8	OED	12X6			350						340	
228	9	OED	12X6			350						335	
219	10	OED	12X6			350						320	
218	11	OED	12X6			350						320	
217	12	OED	20X10			555						515	
200	13	OED	12X7			150						140	
235	14	OED	10X6			200						180	
210	15	OED	12X6			100						95	
212	16	OED	12X6			350						345	
213	17	OED	12X6			350						350	
214	18	OED	12X6			350						340	
215	19	OED	12X6			350						340	
216	20	OED	20X10			350						340	

Remarks: _____

Test Date 9/30/2015Readings By D.T.Page 18 of

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-B EXHAUSTLocation / Zone ROOF / T-1Actual Air Temp. _____ Duct S. P. -0.77

DUCT			REQUIRED			ACTUAL					
SIZE	<u>20X10</u>	AREA	<u>2.22</u>	FPM	<u>954</u>	CFM	<u>2120</u>	FPM	<u>941</u>	CFM	<u>2089</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	666	876	930												
2	927	1079	1125												
3	900	928	1045												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES BATHROOMS AND CLOSETS (OLD EF-15)

Test Date 9/30/2015Readings By DTPage 19 of 19

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-B EXHAUSTLocation / Zone ROOF / T-2Actual Air Temp. _____ Duct S. P. -0.79

DUCT		REQUIRED		ACTUAL							
SIZE	20X20	AREA	2.77	FPM	1070	CFM	2965	FPM	959	CFM	2656

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	698	988	999												
2	1028	1038	999												
3	945	1011	966												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES THE OLD EF 16,18 & 20

Test Date 9/30/2015Readings By DTPage 20 of

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-B EXHAUSTLocation / Zone ROOF / T-3Actual Air Temp. _____ Duct S. P. -0.73

DUCT			REQUIRED			ACTUAL					
SIZE	<u>20X16</u>	AREA	<u>2.22</u>	FPM	<u>930</u>	CFM	<u>2065</u>	FPM	<u>820</u>	CFM	<u>1820</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	783	984	866												
2	760	913	856												
3	564	894	765												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF 20

Test Date 9/30/2015Readings By DTPage 21 of

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOL
Location / Zone ROOF / T-4System Unit HRV-B EXHAUST
Actual Air Temp. Duct S. P. -0.72

DUCT			REQUIRED			ACTUAL					
SIZE	<u>14X12</u>	AREA	<u>1.16</u>	FPM	<u>775</u>	CFM	<u>900</u>	FPM	<u>698</u>	CFM	<u>810</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	709	702	766												
2	678	633	701												
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF 16 & 18

Test Date 9/30/2015Readings By DTPage 22 of

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RECTANGULAR DUCT
PITOT TUBE TEST REPORT

Project MARLTON MIDDLE SCHOOL

System Unit HRV-B EXHAUST

Location / Zone ROOF / T-5

Actual Air Temp. Duct S. P. -0.60

DUCT			REQUIRED			ACTUAL					
SIZE	<u>12X8</u>	AREA	<u>0.66</u>	FPM	<u>682</u>	CFM	<u>450</u>	FPM	<u>603</u>	CFM	<u>398</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	594	612													
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF 16

Test Date 9/30/2015

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Project MARLTON MIDDLE SCHOOL

FAN DATA	FAN NO.	HRV-C SUP	FAN NO.	HRV-C EXH	FAN NO.	
Location	ROOF		ROOF			
Service	C-WING		C-WING			
Manufacturer	GREENHECK		GREENHECK			
Model Number	ERT90-30L		ERT90-30L			
Serial Number	14187641-156		14187641-156			
Type/Class	CENT		CENT			
Motor Make/Style	BALDOR		MARATHON			
Motor H.P./RPM/Frame	7 1/2/1770/213T		5/1765/182T			
Volts/Phase/Hertz	460/3/60		460/3/60			
F.L. Amps/S.F.	9.7/1.15		6.33/1.15			
Motor Sheave Make/Model	WOODS		POWER DRIVE			
Motor Sheave Diam./Bore	VP71 / 1 3/8"		VP56/1 1/8"			
Fan Sheave Make	POWER DRIVE		POWER DRIVE			
Fan Sheave Diam./Bore	7 11/16" / 1 3/16"		6 3/16 / 1 3/16"			
No. Belts/Make/Size	1/ BX74		1/AX72			
Sheave Distance	27 1/2		28 1/4			
MOTOR SHEAVE POSITION	MAX		90% CLOSED			
TEST DATA	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
CFM	6110	6040 (2)	4630	4600(1)		
Fan RPM	1304	1500	1431	1445		
S.P. In/Out		-1.5/28		-1.41/30		
Total S.P.	1.80	1.78	.67	1.71		
Voltage	460	478	460	478		
Amperage	9.7	5.6/6.4/6.4	6.33	4.2/4.4/4.4		

Remarks:

(1) TOTAL CFM AT TRAVERSES 1 & 3.

(2) TOTAL CFM AT TRAVERSES 1 TO 4 AND OUTLETS 1,10,11 AND 18

Test Date 9/3/2015

REVISED 12/3/15

Readings By DT

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-C SUPPLYLocation / Zone C-WING / T-1Actual Air Temp. _____ Duct S. P. 0.06

DUCT		REQUIRED		ACTUAL	
SIZE <u>20X10</u>	AREA <u>1.38</u>	FPM <u>909</u>	CFM <u>1255</u>	FPM <u>862</u>	CFM <u>1189</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	786	843	959												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOMS 315 TO 317

Test Date 10/1/2015Readings By DTPage 26 of

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-C SUPPLYLocation / Zone C-WING / T-2Actual Air Temp. _____ Duct S. P. 0.03

DUCT			REQUIRED			ACTUAL					
SIZE	18X10	AREA	1.25	FPM	840	CFM	1050	FPM	816	CFM	1020

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	893	794	760												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOMS 323,324 AND 328. ROOMS 330 AND 100
COULD NOT BE INCLUDED DUE TO DUCT CONFIGURATION

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NEBB

RECTANGULAR DUCT PITOT TUBE TEST REPORT

Project MARLTON MIDDLE SCHOOL
Location / Zone C-WING / T-3

System Unit HRV-C SUPPLY
Actual Air Temp. _____ Duct S. P. 0.065

DUCT		REQUIRED		ACTUAL	
SIZE <u>20X10</u>	AREA <u>1.38</u>	FPM <u>910</u>	CFM <u>1255</u>	FPM <u>910</u>	CFM <u>1255</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	904	1007	820												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOMS 307 & 309

Test Date 10/1/2015

Readings By DT

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-C SUPPLYLocation / Zone C-WING / T-4

Actual Air Temp. _____

Duct S. P. 0.072

DUCT			REQUIRED			ACTUAL					
SIZE	<u>14X16</u>	AREA	<u>1.55</u>	FPM	<u>1129</u>	CFM	<u>1750</u>	FPM	<u>1185</u>	CFM	<u>1836</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1276	1231	1128												
2	1126	1151	1198												
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOMS 300 TO 304

Test Date 10/1/2015Readings By DTPage 29 of

AIR OUTLET TEST REPORT

AIR OUTLET TEST REPORT

Project MARLTON MIDDLE SCHOOL

System HRV-C SUPPLY

Outlet Manufacturer

Test Apparatus AIR FOIL

[illegible]

Remarks:

Test Date 10/1/2015

Readings By _____ DT _____
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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-C EXHAUSTLocation / Zone ROOF / T-1Actual Air Temp. Duct S. P. -0.19

DUCT			REQUIRED			ACTUAL					
SIZE	20X20	AREA	2.77	FPM	902	CFM	2500	FPM	771	CFM	2136

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	570	666	673												
2	874	844	829												
3	789	864	836												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF-33, 35 & 44

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOL
Location / Zone ROOF / T-2System Unit HRV-C EXHAUST
Actual Air Temp. Duct S. P. -0.13

DUCT		REQUIRED		ACTUAL							
SIZE	20X16	AREA	2.22	FPM	925	CFM	2055	FPM	780	CFM	1731

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	668	758	764												
2	804	835	833												
3	749	781	825												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF-36 & 44

Test Date 10/1/2015Readings By DTPage 32 of

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RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit HRV-C EXHAUSTLocation / Zone ROOF / T-3Actual Air Temp. Duct S. P. -0.83

DUCT		REQUIRED				ACTUAL					
SIZE	<u>20X16</u>	AREA	<u>2.22</u>	FPM	<u>957</u>	CFM	<u>2125</u>	FPM	<u>800</u>	CFM	<u>1776</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	799	784	728												
2	907	898	791												
3	789	784	727												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF-22

Test Date 10/1/2015Readings By DTPage 33 of

AIR OUTLET TEST REPORT

Project MARLTON MIDDLE SCHOOL

System HRV C - EXHAUST

Outlet Manufacturer

Test Apparatus FLOWHOOD

[illegible]

Remarks:

- (1) READING BASED ON TRAVERSE 1 & 2 GRILL AND PLENUM READINGS
(2) DAMPER CLOSED 100%
(3) NO DAMPER

Test Date 10/1/2015

Readings By D.T.

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Project MARLTON MIDDLE SCHOOL

FAN DATA	FAN NO. HRV D SUP	FAN NO. HRV D EXH	FAN NO.			
Location	ROOF	ROOF				
Service	D- WING	D- WING				
Manufacturer	GREENHECK	GREENHECK				
Model Number	ERT90-30L	ERT90-30L				
Serial Number	14187647-156	14187647-156				
Type/Class	CENT	CENT				
Motor Make/Style	BALDOR	BALDOR				
Motor H.P./RPM/Frame	7 1/2/1770/213T	3/1765/182T				
Volts/Phase/Hertz	460/3/60	460/3/60				
F.L. Amps/S.F.	9.7/1.15	4.2/1.15				
Motor Sheave Make/Model	POWER DRIVE	POWER DRIVE				
Motor Sheave Diam./Bore	IVP75/1 3/8	IVP56/ 1 1/8				
Fan Sheave Make	POWER DRIVE	POWER DRIVE				
Fan Sheave Diam./Bore	7 3/16" / 1 3/16"	5 11/16" / 1 3/16"				
No. Belts/Make/Size	1/ BX74	1/AX70				
Sheave Distance	27 1/4	28"				
MOTOR SHEAVE POSITION	MAX	90% CLOSED				
TEST DATA	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
CFM	7195	6953(1)	5655	5500 (2)		
Fan RPM	1103	1700	1049	1430		
S.P. In/Out		-1.8/ 30		-1.36/ 22		
Total S.P.	2.06	2.1	.67	1.58		
Voltage	460	477	460	477		
Amperage	9.7	7.5/7.8/7.2	4.2	4/4.2/4.2		

Remarks:

- (1) TOTAL CFM AT TRAVERSES 1 TO 5 AND ROOM 416A
 (2) TOTAL CFM AT TRAVERSES 1,2 AND 5

Test Date 9/3/2015

REVISED 12/3/15

Readings By DT

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.
Location / Zone D WING / T-1System Unit HRV D SUPPLY
Actual Air Temp. Duct S. P. 0.09

DUCT			REQUIRED			ACTUAL					
SIZE	16X14	AREA	1.5	FPM	710	CFM	1065	FPM	675	CFM	1012

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	512	822	937												
2	633	616	774												
3	596	572	616												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES RM 416

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.
Location / Zone D WING / T-2System Unit HRV D SUPPLY
Actual Air Temp. Duct S. P. 0.14

DUCT			REQUIRED			ACTUAL					
SIZE	<u>18X12</u>	AREA	<u>1.5</u>	FPM	<u>900</u>	CFM	<u>1350</u>	FPM	<u>856</u>	CFM	<u>1284</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	840	909	906												
2	783	834	869												
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOMS 412, 360 AND 409

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.System Unit HRV D SUPPLYLocation / Zone D WING / T-3Actual Air Temp. _____ Duct S. P. 0.18

DUCT		REQUIRED		ACTUAL							
SIZE	<u>30X12</u>	AREA	<u>2.5</u>	FPM	<u>986</u>	CFM	<u>2465</u>	FPM	<u>953</u>	CFM	<u>2383</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	826	1076	1042	922	774										
2	1065	1207	1094	769	760										
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES ROOMS 331, 328 & 339

Test Date 10/2/2015Readings By D.T.Page 38 of

NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.
Location / Zone D WING / T-4System Unit HRV D SUPPLY
Actual Air Temp. Duct S. P. 0.20

DUCT			REQUIRED			ACTUAL					
SIZE	<u>14X14</u>	AREA	<u>1.36</u>	FPM	<u>393</u>	CFM	<u>535</u>	FPM	<u>713</u>	CFM	<u>970</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	745	748	729												
2	720	725	660												
3	716	743	639												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

- (1) THERE IS NO DAMPER FOR THIS BRANCH
(2) TRAVERSE SERVES RM 329

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RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.System Unit HRV D SUPPLYLocation / Zone D WING / T-5Actual Air Temp. _____ Duct S. P. 0.16

DUCT			REQUIRED			ACTUAL					
SIZE	17X10	AREA	1.18	FPM	1097	CFM	1295	FPM	809	CFM	954 (2)

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	824	844	759												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

- (1) TRAVERSE SERVES 417, 419 AND 400 TO 407
 (2) SEE FOOTNOTE ON TRAVERSE 4 SHEET

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AIR OUTLET TEST REPORT

Project MARLTON M.S.

System HRV-D SUPPLY

Outlet Manufacturer

Test Apparatus

[illegible]

Remarks:

(1) NO VOLUME DAMPER FOR THIS BRANCH

(2) OUTLETS ARE LOW BECAUSE OF NOTE 1

Test Date: 10/2/2015

Readings By D.T.

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RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.System Unit HRV D EXHAUSTLocation / Zone ROOF / T-1Actual Air Temp. Duct S. P. 0.44

DUCT			REQUIRED			ACTUAL					
SIZE	<u>22X18</u>	AREA	<u>2.75</u>	FPM	<u>1070</u>	CFM	<u>2945</u>	FPM	<u>977</u>	CFM	<u>2686</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	837	984	941												
2	1120	1054	954												
3	954	978	977												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES THE OLD EF 23,24 & 25

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RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.
Location / Zone ROOF / T-2System Unit HRV D EXHAUST
Actual Air Temp. _____ Duct S. P. 0.37

DUCT			REQUIRED			ACTUAL					
SIZE	<u>14X10</u>	AREA	<u>0.97</u>	FPM	<u>721</u>	CFM	<u>700</u>	FPM	<u>801</u>	CFM	<u>776</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	786	862	725												
2	824	884	730												
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF 21

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.System Unit HRV D EXHAUSTLocation / Zone ROOF / T-3Actual Air Temp. _____ Duct S. P. 0.07

DUCT			REQUIRED			ACTUAL					
SIZE	12X6	AREA	0.5	FPM	540	CFM	270	FPM	493	CFM	247

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	504	482	493												
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES THE OLD EF 25

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RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.System Unit HRV D EXHAUSTLocation / Zone ROOF / T-4

Actual Air Temp. _____ Duct S. P. _____

DUCT		REQUIRED				ACTUAL					
SIZE	<u>18X12</u>	AREA	<u>1.5</u>	FPM	<u>926</u>	CFM	<u>1390</u>	FPM	<u>772</u>	CFM	<u>1158</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	774	606	618												
2	936	902	911												
3	610	776	814												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES THE OLD EF 24

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RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.
Location / Zone ROOF / T-5System Unit HRV D EXHAUST
Actual Air Temp. Duct S. P. -0.33

DUCT				REQUIRED				ACTUAL			
SIZE	<u>24X14</u>	AREA	<u>2.33</u>	FPM	<u>862</u>	CFM	<u>2010</u>	FPM	<u>792</u>	CFM	<u>1845</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	828	817	488	493											
2	840	866	904	890											
3	748	889	893	851											
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF 14 AND 9B

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.System Unit HRV D EXHAUSTLocation / Zone ROOF / T-6Actual Air Temp. Duct S. P. -0.29

DUCT			REQUIRED			ACTUAL					
SIZE	<u>14X14</u>	AREA	<u>1.36</u>	FPM	<u>551</u>	CFM	<u>750</u>	FPM	<u>489</u>	CFM	<u>665</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	504	459	518												
2	538	560	545												
3	469	369	443												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

(1) TRAVERSE SERVES OLD EF 9B

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AIR OUTLET
TEST REPORTProject MARLTON M.S.System HRV -D- EXHAUSTOutlet Manufacturer EXISTTest Apparatus FLOW HOOD

AREA SERVED	OUTLET				DESIGN		PRELIMINARY				FINAL		REMARKS
	NO.	TYPE	SIZE	AK	VEL	CFM	VEL or CFM	VEL or CFM			VEL	CFM	
OLD EF 23													
331	1	EG	12X6			400						320	
329	2	EG	12X12			535						455	
365	3	EG	8X4			140						130	
366	4	EG	8X4			70						70	
367	5	EG	8X4			70						70	
367	6	EG	8X4			70						80	
OLD EF-21													
326	1	EG	12X12			350					(1)	190	
325	2	EG	12X12			350					(1)	160	

Remarks:

(1) TRAVERSE IN CORRIDOR 12FT FROM ROOM 326 SHOWS A TOTAL OF 550 CFM
(SEE T-2 FOR ROOF TRAVERSE FOR COMPARISON)

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Project MARLTON MIDDLE SCHOOL

FAN DATA	FAN NO. HRU-E SUP	FAN NO. HRU-E EXH	FAN NO.			
Location	ROOF	ROOF				
Service	E-WING	E-WING				
Manufacturer	GREENHECK	GREENHECK				
Model Number	ERT-45-30L	ERT-45-30L				
Serial Number	14187642-156	14187643-156				
Type/Class	CENT	CENT				
Motor Make/Style	BALDOR	DAYTON				
Motor H.P./RPM/Frame	5/1750/184T	2/1745				
Volts/Phase/Hertz	460/3/60	460/3/60				
F.L. Amps/S.F.	6.6/1.15	2.8/1.15				
Motor Sheave Make/Model	WOODS	POWER DRIVE				
Motor Sheave Diam./Bore	IVP71/1 1/8"	VP50/ 7/8"				
Fan Sheave Make	POWER DRIVE	POWER DRIVE				
Fan Sheave Diam./Bore	4 1/4" / 1"	3 1/2" / 1"				
No. Belts/Make/Size	1/BX48	1/A45				
Sheave Distance	17"	17 3/4"				
MOTOR SHEAVE POSITION	MAX	MAX				
TEST DATA	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
CFM	3300	3575(1)	3100	3200(2)		
Fan RPM	1743	2700	1313	2075		
S.P. In/Out		-2.0/7.5		-1.10/0.8		
Total S.P.	2.21	2.75	.624	1.18		
Voltage	460	476	460	478		
Amperage	6.6	5/5.1/5	2.80	2.4/2.5/2.5		

Remarks:

- (1) TOTAL CFM AT TRAVERSE
 (2) TOTAL CFM AT FAN DISCHARGE. TOTAL SYSTEM TRAVERSE COULD NOT BE DONE DUE TO DUCT CONFIGURATION

Test Date 9/4/2015

REVISED 12/3/15

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Project MARLTON MIDDLE SCHOOL

FAN DATA	FAN NO.	HRU-E SUP	FAN NO.	HRU-E EXH	FAN NO.	
Location	ROOF		ROOF			
Service	E-WING		E-WING			
Manufacturer	GREENHECK		GREENHECK			
Model Number	ERT-45-30L		ERT-45-30L			
Serial Number	14187642-156		14187643-156			
Type/Class	CENT		CENT			
Motor Make/Style	BALDOR		DAYTON			
Motor H.P./RPM/Frame	5/1750/184T		2/1745			
Volts/Phase/Hertz	460/3/60		460/3/60			
F.L. Amps/S.F.	6.6/1.15		2.8/1.15			
Motor Sheave Make/Model	WOODS		POWER DRIVE			
Motor Sheave Diam./Bore	IVP71/1 1/8"		VP50/ 7/8"			
Fan Sheave Make	POWER DRIVE		POWER DRIVE			
Fan Sheave Diam./Bore	4 1/4" / 1"		3 1/2" / 1"			
No. Belts/Make/Size	1/BX48		1/A45			
Sheave Distance	17"		17 3/4"			
MOTOR SHEAVE POSITION	MAX		MAX			
TEST DATA	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
CFM	3300	3575(1)	3100	3200(2)		
Fan RPM	1743	2700	1313	2075		
S.P. In/Out		-2.0/75		-1.10/08		
Total S.P.	2.21	2.75	.624	1.18		
Voltage	460	476	460	478		
Amperage	6.6	5/5.1/5	2.80	2.4/2.5/2.5		

Remarks:

- (1) TOTAL CFM AT TRAVERSE
 (2) TOTAL CFM AT FAN DISCHARGE. TOTAL SYSTEM TRAVERSE COULD NOT BE DONE DUE TO DUCT CONFIGURATION

Test Date 9/4/2015

REVISED 12/3/15

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RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON M.S.System Unit HRV E - SUPPLYLocation / Zone ROOF / T-1Actual Air Temp. Duct S. P. 0.73

DUCT				REQUIRED				ACTUAL			
SIZE	<u>24X18</u>	AREA	<u>3</u>	FPM	<u>1192</u>	CFM	<u>3576</u>	FPM	<u>1192</u>	CFM	<u>3576</u>

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1130	922	1040	1157											
2	1356	1340	1327	1321											
3	1128	1077	1302	1215											
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

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AIR OUTLET TEST REPORT

Project MARLTON MIDDLE SCHOOL

System HRV E - SUPPLY

Outlet Manufacturer

Test Apparatus AIR FOIL

[illegible]

Remarks:

Test Date 10/1/2015

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AIR OUTLET TEST REPORT

Project MARLTON MIDDLE SCHOOL

System HRV E - EXHAUST

Outlet Manufacturer EXIST

Test Apparatus FLOW HOOD

[illegible]

Remarks:

Test Date 10/1/2015

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Project MARLTON MIDDLE SCHOOLSystem Unit AC-4Location ROOF

UNIT DATA	
Make/Model No.	ROOF
Type/Size	J152JS24
Serial Number	N1G5823664
Arr./Class	DRAW THRU
Discharge	VERTICAL
Make Sheave	POWER DRIVE
Sheave Diam/Bore	BK90/1"
No. Belts/make/size	1 / BX81
No. Filters/type/size	12/PLEAT/24X12X2

MOTOR DATA	
Make/Frame	BALDOR/184T
H.P./RPM (W)	5/1750
Volts/Phase/Hertz	460/3/60
F.L. Amps/S.F.	6.5 / 1.15
Make Sheave	POWER DRIVE
Sheave Diam/Bore	1VP65/ 1 1/8"
Sheave Distance	30 3/4"
Sheave Oper. Diam.	MINIMUM

TEST DATA	DESIGN	ACTUAL
Total CFM (l/s)	6000	5365 (2)
Total S.P.		1.32
Fan RPM	968	1046
External S.P.	.50	.80
Motor Volts	460	
Motor Amps	6.5	6.6/6.5/6.6
Outside Air CFM (l/s)	1530	1440
Return Air CFM (l/s)	4470	3925

TEST DATA	DESIGN	ACTUAL
Discharge S.P.		+ .70
Suction S.P.		-.62 (1)
Reheat Coil S.P.		
Cooling Coil S.P.		(1)
Preheat Coil S.P.		
Filters S.P.		(1)
Vortex Damp. Position		
Out. Air Damp. Position		22%
Ret. Air Damp. Position		78%

Remarks:

- (1) COMBINED DROP
(2) TOTAL CFM AT OUTLETS

Test Date 10/9/2015Readings By DT

REVISED 11/9/15

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AIR OUTLET TEST REPORT

Project MARLTON MIDDLE SCHOOL

System AC-4

Outlet Manufacturer_EXIST

Test Apparatus FLOWHOOD

[illegible]

Remarks:

Test Date 10/9/2015

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Project MARLTON MIDDLE SCHOOL
Location ROOFSystem Unit AC-11

UNIT DATA	
Make/Model No.	ROOF
Type/Size	RVE80-52P
Serial Number	14187644-156
Arr./Class	DRAW THRU
Discharge	VERTICAL
Make Sheave	DIRECT DRIVE
Sheave Diam/Bore	DIRECT DRIVE
No. Belts/make/size	DIRECT DRIVE
No. Filters/type/size	DIRECT DRIVE

MOTOR DATA	
Make/Frame	BALDOR
H.P./RPM (W)	3/1150
Volts/Phase/Hertz	460/3/60
F.L. Amps/S.F.	4.4/1.15
Make Sheave	DIRECT DRIVE
Sheave Diam/Bore	DIRECT DRIVE
Sheave Distance	DIRECT DRIVE
Sheave Oper. Diam.	DIRECT DRIVE

TEST DATA	DESIGN	ACTUAL
Total CFM (l/s)	5500	6000(1)
Total S.P.	664	1.31
Fan RPM	1170	1150
External S.P.	.50	.50
Motor Volts	460	478
Motor Amps	4.4	3.4/3.5/3.4
Outside Air CFM (l/s)	2660	2594(2)
Return Air CFM (l/s)	2840	3410

TEST DATA	DESIGN	ACTUAL
Discharge S.P.		.40
Suction S.P.		.91
Reheat Coil S.P.		
Cooling Coil S.P.		.27
Preheat Coil S.P.		
Filters S.P.		(1)
Vortex Damp. Position		
Out. Air Damp. Position		35%
Ret. Air Damp. Position		65%

Remarks:

(1) CFM BASED ON RPM AND STATIC

(2) O.A. INLET 33X52 = 11.9 X218 FPM = 2594 = CFM

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Project MARLTON MIDDLE SCHOOL
Location ROOF

System Unit AC-12

UNIT DATA	
Make/Model No.	GREENHECK
Type/Size	RVE80-52P
Serial Number	14187646
Arr./Class	DRAW THRU
Discharge	VERTICAL
Make Sheave	DIRECT DRIVE
Sheave Diam/Bore	DIRECT DRIVE
No. Belts/make/size	DIRECT DRIVE
No. Filters/type/size	6/PLEAT/20X24X2

MOTOR DATA	
Make/Frame	BALDOR
H.P./RPM (W)	3/1150
Volts/Phase/Hertz	460/3/60
F.L. Amps/S.F.	4.4/1.15
Make Sheave	DIRECT DRIVE
Sheave Diam/Bore	DIRECT DRIVE
Sheave Distance	DIRECT DRIVE
Sheave Oper. Diam.	DIRECT DRIVE

TEST DATA	DESIGN	ACTUAL
Total CFM (l/s)	5500	6000(1)
Total S.P.	1.64	1.22
Fan RPM	1170	1170
External S.P.	.50	.50
Motor Volts	460	477
Motor Amps	4.4	3.5/3.5/3.5
Outside Air CFM (l/s)	2660	2600
Return Air CFM (l/s)	2840	3400
VFD		60HZ

TEST DATA	DESIGN	ACTUAL
Discharge S.P.		.32
Suction S.P.		-.90
Reheat Coil S.P.		
Cooling Coil S.P.		.28
Preheat Coil S.P.		
Filters S.P.		
Vortex Damp. Position		
Out. Air Damp. Position		35%
Ret. Air Damp. Position		65%

Remarks:

- (1) CFM BASED ON RPM AND STATIC
(2) O.A. INLET 33X52 = 11.9 X 218 FPM = 2600 =CFM

Test Date 9/4/2015

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Project MARLTON MIDDLE SCHOOL

FAN DATA	FAN NO. AC-11		FAN NO.		FAN NO. AC-12	
Location	ROOF				ROOF	
Service	EXHAUST				EXHAUST	
Manufacturer	GREENHECK				GREENHECK	
Model Number	RVE80-52P				RVE80-52P	
Serial Number	14187644-156				14187646-156	
Type/Class	CENT				CENT	
Motor Make/Style	BALDOR				BALDOR	
Motor H.P./RPM/Frame	5/1750/184T				5/1750/184T	
Volts/Phase/Hertz	460/3/60				460/3/60	
F.L. Amps/S.F.	6.6/1.15				6.6/1.15	
Motor Sheave Make/Model	DIRECT DRIVE				DIRECT DRIVE	
Motor Sheave Diam./Bore	DIRECT DRIVE				DIRECT DRIVE	
Fan Sheave Make	DIRECT DRIVE				DIRECT DRIVE	
Fan Sheave Diam./Bore	DIRECT DRIVE				DIRECT DRIVE	
No. Belts/Make/Size	DIRECT DRIVE				DIRECT DRIVE	
Sheave Distance	DIRECT DRIVE				DIRECT DRIVE	
TEST DATA	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
CFM	5500	5685(1)			5500	5676(2)
Fan RPM	1717	1750			1717	1750
S.P. In/Out		-1.00/08				.98/08
Total S.P.	1.10	1.08			1.10	1.06
Voltage	460	477			460	477
Amperage	6.6	4.4/4.5/4.6			6.6	4.2/4/4.2
VFD		60HZ				60HZ

Remarks:

(1) READING TAKEN FAN DISCHARGE

31X22=4.73 X 1202 FPM = 5685

(2) 31X22 = 4.73 X 1200 FPM = 5676

(3) FANS ARE CONTROLLED BY CO2 SENSOR CONTROLS

FANS WERE SET TO MAINTAIN A MINIMUM OF 2600 CFM

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Project MARLTON MIDDLE SCHOOL

FAN DATA	FAN NO. EF-30		FAN NO. MUA-K		FAN NO.	
Location	ROOF		ROOF			
Service	KITCH HOOD		KITCHEN			
Manufacturer	COOK		GREENHECK			
Model Number	245VCR245V8B		IGX-112-H22-H2			
Serial Number	076SF9127400701		14189952			
Type/Class	UP BLAST		MUA			
Motor Make/Style	WEG		MARATHON			
Motor H.P./RPM/Frame	1 1/2/1750/145T		1/1725/56			
Volts/Phase/Hertz	208/3/60		208/1/60			
F.L. Amps/S.F.	4.5/1.15		7.0/1.15			
Motor Sheave Make/Model	MAUREY		BROWNING			
Motor Sheave Diam./Bore	3 3/4" O.D. / 7/8"		VP34/1 5/8"			
Fan Sheave Make	MAUREY		WOODS			
Fan Sheave Diam./Bore	6 1/2" O.D. / 1"		AK 7.1 / 1"			
No. Belts/Make/Size	1 / AX26		1 / AP56			
Sheave Distance	6 1/2		21"			
MOTOR SHEAVE POSIT	MINIMUM		MAX			
TEST DATA	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
CFM	4000	4920	3200	3245		
Fan RPM	752	800	772	734		
S.P. In/Out		-.68/-		-.17/.22		
Total S.P.	1.0	.68	.50	.39		
Voltage	208	212	208	212		
Amperage	4.5	3.8/3.7/3.8	7.0	7.0/7.0		

Remarks:

Test Date 10/9/2015Readings By D.T.

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NEBB

RECTANGULAR DUCT
PITOT TUBE TEST REPORTProject MARLTON MIDDLE SCHOOLSystem Unit MUA - KLocation / Zone ROOF T-1Actual Air Temp. _____ Duct S. P. 0.14

DUCT			REQUIRED			ACTUAL		
SIZE	<u>16X16</u>	AREA	<u>1.77</u>	FPM	<u>904</u>	CFM	<u>1660</u>	

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	818	983	927												
2	854	780	969												
3	1034	1110	967												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

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RECTANGULAR DUCT
PITOT TUBE TEST REPORT

Project MARLTON MIDDLE SCHOOL
Location / Zone ROOF T-2

System Unit MUA - K
Actual Air Temp. Duct S. P. 0.16

DUCT			REQUIRED			ACTUAL					
SIZE	16X16	AREA	1.77	FPM	904	CFM	1600	FPM	896	CFM	1586

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	865	896	859												
2	1082	1048	699												
3	1027	1037	758												
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
VELOCITY															
SUB-TOTALS															

Remarks:

Test Date 10/9/2015

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AIR OUTLET TEST REPORT

Project MARLTON MIDDLE SCHOOL

System EF-30

Outlet Manufacturer

Test Apparatus VELEGRID

[illegible]

Remarks:

Test Date 10/9/2015

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Project MARLTON MIDDLE SCHOOL

DATA	Pump No. 1	Pump No. 2	Pump No.	Pump No. 3	Pump No. 4
Location	BOILER RM	BOILER RM		BOILER RM	BOILER RM
Service	PRIM C.W.	PRIM C.W.		SECOND CW	SECOND CW
Manufacturer	B & G	B & G		B & G	B & G
Model Number	1510	1510		1510	1510
Serial Number	C20988701G51	C20988702G51		C208988801G51	C208988802G51
GPM / Head	179/25FT	179/25FT		179/70FT	179/70FT
Req. NPSH					
Pump RPM	1800	1800		1800	1800
Impeller Diam.	7.75	7.75		8.375	8.375
Motor Mfr. / Frame	WEG/182T	WEG/182T		WEG/213T	WEG/213T
Motor HP / RPM	2/1150	2/1150		7 1/2 / 1770	7 1/2 / 1770
Volts / Phase / Hertz	460/3/60	460/3/60		460/3/60	460/3/60
F. L. Amps / S. F.	2.95/1.15	2.95/1.15		9.25/1.15	9.25/1.15
Seal Type	STANDARD	STANDARD		STANDARD	STANDARD
Pump Off. Press.	44	44		48	48
Valve Shut Diff.	11	11		32.5	32.5
Act. Impeller Diam.	7.75	7.75		8.375	8.375
Valve Open Diff.	10	10		29	29
Valve Open GPM	198	198		196	196
Final Dischg. Press.	51.5	51.5		70.5	70.5
Final Suction Press.	41.5	41.5		41.5	41.5
Final P	10	10		29	29
Final GPM	198	198		196	196
Voltage	485	485		485	485
Amperage	2.4/2.6/2.4	2.3/2.7/2.4		7.00	6.90
VFD				56HZ	56HZ

Remarks

(1) D.P. FOR PUMPS 3 & 4 WAS SET AT 8.5

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BALANCE VALVE/FLOW METER TEST REPORT

Project MARLTON M.S.
Location _____

SystemUnit CHILLED WATER

[illegible]

Remarks:

Test Date 10/13/2015

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BALANCE VALVE/FLOW METER TEST REPORT

Project MARLTON MIDDLE SCHOOL
Location _____

SystemUnit HOT WATER

[illegible]

Remarks:

- (1) DISCHARGE PRESSURE AT PUMP WAS 47 PSI (HW PUMP #1)
(2) COILS WERE BALANCED BASED ON TOTAL FLOW TO THE 5 UNITS

Test Date 10/14/2015

Readings By DT

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