

KD ENGINEERING co.

MECHANICAL ENGINEERS AND TECHNOLOGISTS
3735 MYRTLE STREET, BURNABY, B.C. V5C 4E7

TESTING AND BALANCING ANALYSIS REPORT

PROJECT: [REDACTED]

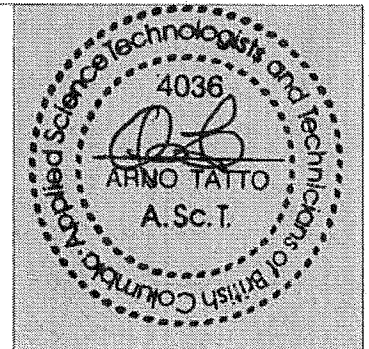
ARCHITECT: [REDACTED]

ENGINEER: [REDACTED]

CLIENT: [REDACTED]

Certification:

THE FLUID DISTRIBUTION SYSTEMS REFERENCED IN THIS REPORT HAVE BEEN TESTED AND BALANCED WITH RESPECT TO THE REQUIREMENTS OF THE SPECIFICATIONS. THE RESULTS OF THE SITE TESTS AND ADJUSTMENTS ARE TABULATED WITHIN THIS DOCUMENT.



KD PROJECT #: 1110240

BY: [REDACTED]

DATE: August 15, 2012

APPROVED BY:

Arno Tatto
A. Sc.T.
A. TATTO, AScT.

REVISION: Rev.B September 26, 2012

Field Notes

Project: [REDACTED]

Date: August 15, 2012
REV A. September 20, 2012
REV. B September 26, 2012

1. Air Balancing

1.1. AHU – 1

This unit was tested with the VFDs running at 100%. The minimum outdoor air set point was set at 25% which allow 15% of the total air volume, there was no change to the total air volume. At time of testing the outdoor air temp was 28°C and the return air temp was 20°C.

1.2. AHU – 2

This unit was tested with the VFDs running at 100%. The minimum outdoor air set point was set at 20% which allow 15% of the total air volume, there was no change to the total air volume. At time of testing the outdoor air temp was 28°C and the return air temp was 22°C.

1.3. AHU – 3

This unit was tested with the VFDs running at 100%. The minimum outdoor air set point was set at 20% which allow 15% of the total air volume, there was no change to the total air volume. At time of testing the outdoor air temp was 28°C and the return air temp was 21°C.

1.4. AHU – 4

This unit was tested with the VFDs running at 100% and all the VAV set to their maximum flow. The minimum outdoor air set point was set at 20% which allow 15% of the total air volume, there was no change to the total air volume. At time of testing the outdoor air temp was 28°C and the return air temp was 21°C. The static pressure set point was set to 300 Pa.

2. Water Balancing

2.1. P – 5A & B

These pumps were tested with one pump running at 60Hz and all the AHU valves wide open and the bypass closed.

2.2. P – 6A & B

These pumps were tested with one pump running at 60Hz. These pumps are under delivering on water volume and due to a high system pressure.

2.3. P – 7A & B

These pumps were tested with one pump running at 60Hz and all the reheat, radiant panels and VAV valves wide open and the bypass closed.

Field Notes

2.4. RP – 1

This pump doesn't have taps or gauges and has no balancing valve at the pump. Downstream some of the CBV's are armflow1/2 require too low of a pressure drop to get an accurate reading. The sinks were tested at the end of the classroom wing and were able to get warm water quickly.

2.5. RHC-3-5

No access to the CBV due to ductwork and piping in the way.

2.6. Non-Staff Related Washrooms

A bucket test of faucets indicated a flow of 2.7-2.9 L/min. at all washrooms.

A bucket test of the showers indicated a flow of 1.75-2.0 L/min.

SAMPLE

KD Engineering Co

Flow Measuring Devices

Re-heating Loop

UNIT	CBV		Req'd Flow L/S	Act Flow L/S	Press Drop KPA	Setting				
	Make	Size								
RHC1-5	TA	1/2	0.25	0.23	32.85	3.0				
RAD 315	TA	1/2	0.06	0.05	68.68	1.0				
RHC2-4	TA	1/2	0.30	0.30	17.02	4.0				
RHC1-4	TA	1/2	0.25	0.24	35.83	3.0				
RAD 311	TA	1/2	0.06	0.05	68.68	1.0				
RAD 309	TA	1/2	1.30	0.05	68.68	1.0				
RAD 318	TA	1/2	0.06	0.05	68.68	1.0				
RAD 316	TA	1/2	0.06	0.05	68.68	1.0				
RHC1-3	TA	1/2	0.25	0.24	35.83	3.0				
RHC2-3	TA	1/2	0.25	0.24	10.45	4.0				
RHC2-2	TA	1/2	0.25	0.24	10.45	4.0				
RHC1-2	TA	1/2	0.25	0.24	10.75	4.0				
RHC2-1	TA	1/2	0.25	0.24	35.83	3.0				
RAD 306	TA	1/2	0.06	0.05	68.68	1.0				
RAD 303	TA	1/2	0.06	0.05	68.68	1.0				
RAD 310	TA	1/2	0.06	0.05	68.68	1.0				
RAD 308	TA	1/2	0.06	0.05	68.68	1.0				
RHC1-1	TA	1/2	0.25	0.24	35.83	3.0				
RAD 420	TA	1/2	0.06	0.05	68.68	1.0				
RHC1-13	TA	1/2	0.30	0.30	25.38	3.5				
RHC1-12	TA	1/2	0.25	0.23	32.85	3.0				
RHC2-7	TA	1/2	0.25	0.24	35.83	3.0				
RAD 419	TA	1/2	0.06	0.05	68.68	1.0				
RAD 411	TA	1/2	0.06	0.05	68.68	1.0				
RAD 410	TA	1/2	0.06	0.05	68.68	1.0				
RAD 408	TA	1/2	0.06	0.05	68.68	1.0				

* SEE FIELD NOTE

KD Engineering Co

Flow Measuring Devices

Re-heating Loop

UNIT	CBV		Req'd Flow	Act Flow	Press Drop	Setting			
	Make	Size	GPM	GPM	FT				
RHC1-5	TA	1/2	4.00	3.60	11.0	3.0	90%		
RAD 315	TA	1/2	0.90	0.80	23.0	1.0	89%		
RHC2-4	TA	1/2	4.70	4.70	5.7	4.0	100%		
RHC1-4	TA	1/2	3.90	3.80	12.0	3.0	97%		
RAD 311	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 309	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 318	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 316	TA	1/2	0.90	0.80	23.0	1.0	89%		
RHC1-3	TA	1/2	4.00	3.80	12.0	3.0	95%		
RHC2-3	TA	1/2	3.90	3.80	3.5	4.0	97%		
RHC2-2	TA	1/2	3.90	3.80	3.5	4.0	97%		
RHC1-2	TA	1/2	3.90	3.80	3.5	4.0	97%		
RHC2-1	TA	1/2	3.90	3.80	12.0	3.0	97%		
RAD 306	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 303	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 310	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 308	TA	1/2	0.90	0.80	23.0	1.0	89%		
RHC1-1	TA	1/2	3.90	3.80	12.0	3.0	97%		
RAD 420	TA	1/2	0.90	0.80	23.0	1.0	89%		
RHC1-13	TA	1/2	4.70	4.70	8.5	3.5	100%		
RHC1-12	TA	1/2	3.90	3.60	11.0	3.0	92%		
RHC2-7	TA	1/2	4.00	3.80	12.0	3.0	95%		
RAD 419	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 411	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 410	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 408	TA	1/2	0.90	0.80	23.0	1.0	89%		

* SEE FIELD NOTE

KD Engineering Co

Flow Measuring Devices

Re-heating Loop

UNIT	CBV		Req'd Flow GPM	Act Flow GPM	Press Drop FT	Setting			
	Make	Size							
RHC2-6	TA	1/2	4.30	3.80	5.8	3.5	88%		
RHC1-11	TA	1/2	3.90	3.60	11.0	3.0	92%		
RHC1-10	TA	1/2	3.90	3.60	11.0	3.0	92%		
RHC1-9	TA	1/2	4.30	3.90	6.2	3.5	91%		
RHC2-5	TA	1/2	3.90	3.60	11.0	3.0	92%		
RAD 409	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 401	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 404	TA	1/2	0.90	0.80	23.0	1.0	89%		
RAD 402	TA	1/2	0.90	0.80	23.0	1.0	89%		
RHC1-8	TA	1	8.70	8.00	14	4.0	92%		
RHC1-6	TA	1/2	3.30	3.20	2.5	4.0	97%		
RHC1-7	TA	1/2	0.80	0.70	23.0	1.0	88%		
RHC3-13	TA	3/4	5.90	6.00	1.9	4.0	102%		
RHC3-12	TA	1/2	0.90	0.90	15.7	1.5	100%		
RHC3-11	TA	1/2	1.10	1.00	15.7	1.5	91%		
RHC3-10	TA	1/2	1.50	1.40	11.0	2.0	93%		
RHC3-9	TA	1/2	1.10	1.00	16.0	1.5	91%		
RHC3-8	TA	1/2	1.10	1.00	16.0	1.5	91%		
RHC3-7	TA	1/2	1.10	1.00	16.0	1.5	91%		
RHC3-6	TA	1/2	4.40	4.00	3.8	4.0	91%		
RHC3-2	TA	1/2	1.60	1.50	13.0	2.0	94%		
RHC3-3	TA	1/2	1.20	1.10	1.9	1.5	92%		
RHC3-5	TA	*	4.40	N/AV	N/AC	N/AC	*		
RHC3-4	TA	1/2	4.40	4.00	4.0	4.0	91%		
VAV-1	TA	1 1/4	11.00	12.00	1.3	4.0	109%		
VAV-2	TA	1 1/4	11.00	12.00	1.3	4.0	109%		
VAV-3	TA	3/4	3.50	3.80	16.0	1.5	109%		
VAV-4	TA	1	6.70	6.50	14.5	1.5	97%		
VAV-5	TA	1	6.20	5.60	11.5	1.5	90%		

* SEE FIELD NOTE

KD Engineering Co
Flow Measuring Devices

Re-heating Loop

UNIT	CBV		Req'd Flow GPM	Act Flow GPM	Press Drop FT	Setting			
	Make	Size							
RHC3-1	TA	1 1/4	7.80	7.00	3.5	2.0	90%		

SAMPLE

* SEE FIELD NOTE

KD Engineering Co
Flow Measuring Devices

Heat pump Loop

UNIT	CBV		Req'd Flow	Act Flow	Press Drop	Setting					
	Make	Size	L/S	L/S	KPA						
HP-1	TA	3/4	0.18	0.19	2.89	3.0					
HP-2	TA	1	0.45	0.41	46.24	1.5					
HP-3	TA	3/4	0.18	0.18	43.35	1.3					
HP-4	TA	3/4	0.36	0.35	4.91	3.0					
HP-5	TA	1	0.36	0.34	2.89	4.0					

* SEE FIELD NOTE

KD Engineering Co
Flow Measuring Devices

Heat pump Loop

UNIT	CBV		Req'd Flow	Act Flow	Press Drop	Setting				
Room	Make	Size	GPM	GPM	FT					
119	Armflo	1/2 LF	N/AV	0.40	0.8	1.0				
117	Armflo	1/2 LF	N/AV	0.40	0.8	1.0				
115	Armflo	1/2 LF	N/AV	0.40	0.8	1.0				
118A	Armflo	1/2	N/AV	*	*	1.0				
118B	Armflo	1/2	N/AV	*	*	1.0				
100	Armflo	1/2	N/AV	*	*	1.0				
100F	Armflo	1 1/2	N/AV	*	*	2.0				
101	Armflo	1/2 LF	N/AV	0.45	1.0	1.0				
102	Armflo	1/2 LF	N/AV	0.45	1.0	1.0				
303A	Armflo	1/2	N/AV	*	*	1.0				
305A	Armflo	1/2	N/AV	*	*	1.0				
309A	Armflo	1/2	N/AV	*	*	1.0				
311A	Armflo	1/2	N/AV	*	*	1.0				
315A	Armflo	1/2	N/AV	*	*	1.0				
312	Armflo	1/2	N/AV	*	*	1.0				
314	Armflo	1/2	N/AV	*	*	1.0				
407	Armflo	1/2	N/AV	*	*	1.0				
413	Armflo	1/2	N/AV	*	*	1.0				
417	Armflo	1/2	N/AV	*	*	1.0				

* SEE FIELD NOTE

AIR MOVING EQUIPMENT DATA

PAGE 1 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	AHU - 1 SUPPLY	AHU - 1 RETURN	AHU - 2 SUPPLY
LOCATION	MECH ROOM 1	MECH ROOM 1	MECH ROOM 1
AREA/SYSTEM SERVED	SOUTH CLASSES	SOUTH CLASSES	NORTH CLASSES
UNIT MAKE	MCQUAY		MCQUAY
UNIT MODEL	CAH035GDDC		CAH017GDDC
SERIAL NUMBER	FB000110500329		FB00110500373
FAN MAKE	---		
FAN MODEL	---		

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	6425 (*1) 6415 (*2)	6583 (*2)	6160 (*1,2)	6460 (*2)	3465 (*1) 3472 (*2)	3540 (*2)
TOTAL STATIC PRESSURE (Pa)	E.S.P. 450	570	E.S.P. 450	395	E.S.P. 375	630
SUCTION PRESSURE (Pa)		-130		-385		-200
DISCHARGE PRESSURE (Pa)		+440		+10		+430
OUTDOOR AIR (%)		100		---		100
RETURN AIR (%)		---		100		---
RELIEF AIR (%)		---		100		---

Drive Data:

FAN SHEAVE	2B5V80	2B5V200	2B5V58
MOTOR SHEAVE	2B5V58	2VP71	2BK65H
BELT(s)	5VX900 (2)	5VX880 (2)	BX68 (2)
FAN RPM	1280	555	1580
VP SHEAVE/BLADE ANGLE	FIXED	NEAR MAX	FIXED

Motor Data:

MAKE	BALDOR	BALDOR	BALDOR
SIZE (HP)	15.0	15.0	10.0
MOTOR RPM	1760	1760	1770
VOLTAGE/PHASE	575 / 3	575 / 3	575 / 3
AMPERAGE - NAMEPLATE	14.1	14.1	10.0
AMPERAGE - ACTUAL	10.9	9.8	8.0
FRAME	254T	254T	215T

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Inlet/Outlet Total, (3)Pitot Tube Traverse(s), (4) Performance Curve/Chart, (5)Velometer/Anemometer Traverse(s) N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible, D.D. = Direct Driven Fan

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & Pa)

Template Name: AMDMPPA

K.D. ENGINEERING Co.

AIR MOVING EQUIPMENT DATA

PAGE 2 OF 17
DATE: 28/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	AHU - 2 RETURN	AHU - 3 SUPPLY	AHU - 3 RETURN
LOCATION	MECH ROOM 1	MECH ROOM 2	MECH ROOM 2
AREA/SYSTEM SERVED	NORTH CLASSES	ADMIN / DRAMA / MP	CORRIDOR
UNIT MAKE		MCQUAY	
UNIT MODEL		CAH014GDCC	
SERIAL NUMBER		FB00110500401	
FAN MAKE			
FAN MODEL			

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	3290 (*1, *2)	3058 (*2)	3260 (*1) 3090 (*2)	3166 (*2)	2930 (*1)	2700 (*5)
TOTAL STATIC PRESSURE (Pa)	E.S.P. 325	443	E.S.P. 400	575	E.S.P. 200	165
SUCTION PRESSURE (Pa)		-133		-175		-5
DISCHARGE PRESSURE (Pa)		-300		+400		+160
OUTDOOR AIR (%)				100		---
RETURN AIR (%)		100		---		100
RELIEF AIR (%)		100		---		100

Drive Data:

FAN SHEAVE	2BK110	1B5V86	2BK140
MOTOR SHEAVE	2VP50	BK85H	2VP50
BELT(s)	BX50 (2)	BX75	BX56 (2)
FAN RPM	736	1700	583
VP SHEAVE/BLADE ANGLE	MAX	FIXED	MAX

Motor Data:

MAKE	BALDOR	BALDOR	BALDOR
SIZE (HP)	5.0	7.5	5.0
MOTOR RPM	1750	1770	1750
VOLTAGE/PHASE	575 / 3	575 / 3	575 / 3
AMPERAGE - NAMEPLATE	5.2	7.8	5.2
AMPERAGE - ACTUAL	4.0	7.4	2.4
FRAME	184T	213T	184T

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Inlet/Outlet Total, (3)Pitot Tube Traverse(s), (4) Performance Curve/Chart, (5)Velometer/Anemometer Traverse(s) N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible, D.D. = Direct Driven Fan

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & Pa)

Template Name: AKOVMPA

K.D. ENGINEERING Co.

AIR MOVING EQUIPMENT DATA

PAGE 3 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	AHU - 4 SUPPLY	AHU - 4 RETURN	
LOCATION	MECH ROOM 2	MECH ROOM 2	
AREA/SYSTEM SERVED	GYM	GYM	
UNIT MAKE	MCQUAY		
UNIT MODEL	CAH030GDCC		
SERIAL NUMBER	FB00110500361		
FAN MAKE			
FAN MODEL			

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	5760 (*1) 5835 (*2)	5800 (*2)	4830 (*1) 5020 (*2)	5277 (*2)		
TOTAL STATIC PRESSURE (Pa)	E.S.P. 450	845	E.S.P. 300	385		
SUCTION PRESSURE (Pa)		-345		-75		
DISCHARGE PRESSURE (Pa)		+500		+320		
OUTDOOR AIR (%)		100		---		
RETURN AIR (%)		---		100		
RELIEF AIR (%)		---		100		

Drive Data:

FAN SHEAVE	2B5V66	2B5V200	
MOTOR SHEAVE	2B5V58	2VP60	
BELT(s)	5VX830 (2)	BX87 (2)	
FAN RPM	1550	400	
VP SHEAVE/BLADE ANGLE	FIXED	MID	

Motor Data:

MAKE	BALDOR	BALDOR	
SIZE (HP)	15.0	7.5	
MOTOR RPM	1765	1770	
VOLTAGE/PHASE	575 / 3	575 / 3	
AMPERAGE - NAMEPLATE	14.0	7.8	
AMPERAGE - ACTUAL	11.4	5.6	
FRAME	254T	213T	

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Inlet/Outlet Total, (3)Pitot Tube Traverse(s), (4) Performance Curve/Chart, (5)Velometer/Anemometer Traverse(s) N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible, D.D. = Direct Driven Fan

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & Pa)

Template Name: AMDVMPA

K.D. ENGINEERING Co.

EXHAUST/SUPPLY/RETURN FAN DATA

PAGE 4 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	EF - 1	EF - 2	EF - 3
LOCATION	MECH ROOM ME-2	MECH ROOM ME-2	MECH ROOM ME-1
AREA/SYSTEM SERVED	CENTRAL WASHROOM EXHAUST	GYM CHANGE ROOM EXHAUST	CLASSROOM WASHROOM EXHAUST
UNIT MAKE	LOREN COOK	LOREN COOK	LOREN COOK
UNIT MODEL	100HCS	150TCN-B	165 TCM-B

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	200 (*2)	180 (*2)	895 (*1, *2)	910 (*2)	925 (*1, *2)	916 (*2)
TOTAL STATIC PRESSURE (Pa)		125	170	138	215	200
SUCTION PRESSURE (Pa)		-50		-100		-125
DISCHARGE PRESSURE (Pa)		75		+38		+75

Drive Data:

FAN SHEAVE	MA33	AK4 7/8"OD	N/Ac
MOTOR SHEAVE	MV34	1VP34	1VP4 3/8"OD
BELT(s)	A35	A44	A48
FAN RPM	1365	1172	N/Ac
VP SHEAVE/BLADE ANGLE	MAX	MID	MAX

Motor Data:

MAKE	QUEACE	MARATHON	CENTURY AC MOTOR
SIZE (HP)	0.25	0.5	0.75
MOTOR RPM	1725	1725	1725
VOLTAGE/PHASE	115 / 1	208 / 1	208 / 1
AMPERAGE - NAMEPLATE	4.8	4.1	5.4
AMPERAGE - ACTUAL	4.6	3.0	4.2
FRAME	56	56	J56

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Inlet/Outlet Total, (3)Pitot Tube Traverse(s), (4) Performance Curve/Chart, (5)Velometer/Anemometer Traverse(s) N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible, D.D. = Direct Driven Fan

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & Pa)

Template Name: EXH3MPA

K.D. ENGINEERING Co.

EXHAUST/SUPPLY/RETURN FAN DATA

PAGE 5 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	EF-5	EF-10	
LOCATION	ROOF	MECH ROOM MR - 1	
AREA/SYSTEM SERVED	KINDERGARTEN KITCHEN EXHAUST	ELEV MECH ROOM	
UNIT MAKE	LOREN COOK	DELHI	
UNIT MODEL	100V2B	209INS	

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	300 (*2)	305 (*2)	300 (*2)	320 (*2)		
TOTAL STATIC PRESSURE (Pa)		215		70		
SUCTION PRESSURE (Pa)		-215		-20		
DISCHARGE PRESSURE (Pa)		ATM		+50		

Drive Data:

FAN SHEAVE	AK32	AK66H	
MOTOR SHEAVE	VP32	1VP 3 X 3/8" OD	
BELT(s)	1L190	AP37	
FAN RPM	1645	750	
VP SHEAVE/BLADE ANGLE	NEAR MAX	MIN	

Motor Data:

MAKE	A.C. SMITH	MARATHON	
SIZE (HP)	FRAC	0.25	
MOTOR RPM	1750	1750	
VOLTAGE/PHASE	208 / 1	115 / 1	
AMPERAGE - NAMEPLATE	3.1	5.0	
AMPERAGE - ACTUAL	2.9	3.0	
FRAME	48	48Y	

** See field note

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Inlet/Outlet Total, (3)Pitot Tube Traverse(s), (4) Performance Curve/Chart, (5)Velometer/Anemometer Traverse(s) N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible, D.D. = Direct Driven Fan

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & Pa)

Template Name: EXH&M&P&A

K.D. ENGINEERING Co.

EXHAUST/SUPPLY/RETURN FAN DATA

PAGE 6 OF 17
DATE: 25/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	EF-4	EF-6	EF-9
LOCATION	DAYCARE CEILING SPACE	SPECIAL ED CEILING SPACE	SPECIAL ED CEILING SPACE
SERVICE	DAYCARE WASHROOM EXHAUST	ADMIN GENERAL EXHAUST	ADMIN WASHROOMS
UNIT MAKE	REVERSOMATIC	REVERSOMATIC	REVERSOMATIC
UNIT MODEL	R1 500	R1 700	R1 700

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
AIR FLOW (l/s)	100 (*1, 2)	110 (*2)	215 (*1, 2)	290 (*2)	80 (*2)	80 (*2)
RATED AMPERAGE		0.7		3.5		2.2
ACTUAL AMPERAGE		0.7		2.1		2.2
FAN SPEED		HIGH		LOW		HIGH

Unit Identification:

TAG			
LOCATION			
SERVICE			
UNIT MAKE			
UNIT MODEL			

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
AIR FLOW (l/s)						
RATED AMPERAGE						
ACTUAL AMPERAGE						
FAN SPEED						

* Flow Specified/Determined by: (1) Mechanical Schedule, (2) Inlet/Outlet Total, (3) Pitot Tube Traverse(s), (4) Performance Curve/Chart, (5) Velometer/Anemometer Traverse(s) N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible, D.D. = Direct Driven Fan

Project Number: 1110240

REV: A Date: 25/09/2012

Template Type: Metric (l/s)

Template Name: EXH6M

K.D. ENGINEERING Co.

PUMP DATA

PAGE 7 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	P-1	P-2	P-3
LOCATION	MECH ROOM MR-2	MECH ROOM MR-2	MECH ROOM MR-2
EQUIPMENT/SYSTEM SERVED	GEOTHERMAL LOOP PUMP	GEOTHERMAL LOOP PUMP	MAIN LOOP HTG WATER
UNIT MAKE	GOULDS PUMPS ITT	GOULDS PUMPS ITT	B & G
UNIT MODEL	2.5 X 3-10	2.5 X 3-10	BOSC - BF 4X4X9.5
SERIAL NUMBER	K1122079	K1122078	N/Ac
IMPELLER SIZE - DOCUMENTED	9 15/16	9 15/16	

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	17 (*1)	17 (*3)	17 (*1)	17 (*3)	22.7 (*1)	22.7 (*4)
PUMP HEAD (m.w.g.)	11.2	N/Av**	11.2	N/Av**	18.6	18.3
DIFFERENTIAL PRESSURE (kPa)		N/Av		N/Av		179
SUCTION PRESSURE (kPa)		N/Av		N/Av		124
DISCHARGE PRESSURE (kPa)		N/Av		N/Av		303

Deadhead Data

IMPELLER SIZE - DEADHEAD						
PUMP HEAD (m.w.g.)	N/Av		N/Av			21.1
DIFFERENTIAL PRESSURE (kPa)	N/Av		N/Av			207
SUCTION PRESSURE (kPa)	N/Av		N/Av			165
DISCHARGE PRESSURE (kPa)	N/Av		N/Av			372

Motor Data:

MAKE	WEG	WEG	WEG
SIZE (HP)	15.0	15.0	10.0
MOTOR RPM	1765	1765	1765
VOLTAGE/PHASE	575 / 3	575 / 3	575 / 3
AMPERAGE - NAMEPLATE	14.2	14.2	9.8
AMPERAGE - ACTUAL	10.6 / 10.6 / 10.8	10.4 / 10.4 / 10.8	9.1 @ VFD
FRAME	254T	254T	213 / 5TC

** No gauges

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, (3)Flow Measuring Device(s), (4)Performance Curve/Chart, (5)Element Temperature Drop(s), (6)Element Pressure Drop(s), N/Av = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & m.w.g. & kPa)

Template Name: PUMPM

K.D. ENGINEERING Co.

PUMP DATA

PAGE 5 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	P - 4	P - 5A	P - 5B
LOCATION	MECH ROOM MR-2	MECH ROOM MR-2	MECH ROOM MR-2
EQUIPMENT/SYSTEM SERVED	MAIN LOOP HTG WATER	RE-HEATING LOOP PUMP (BUILDING SIDE)	RE-HEATING LOOP PUMP (BUILDING SIDE)
UNIT MAKE	B & G	B & G	B & G
UNIT MODEL	BOSC - BF 4X4X9.5	80S-BF 5X7B	80S-BF 5X7B
SERIAL NUMBER	N/A	707721A	707721B
IMPELLER SIZE - DOCUMENTED	---		

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	22.7 (*1)	22.7 (*4)	17.6 (*1) 20.0 (*2)	23.1 (*2)	17.6 (*2) 20.0 (*2)	23.1 (*2)
PUMP HEAD (m.w.g.)	18.6	18.3	18.6	11.9	18.6	11.9
DIFFERENTIAL PRESSURE (kPa)		179		117		117
SUCTION PRESSURE (kPa)		121		248		248
DISCHARGE PRESSURE (kPa)		303		365		365

Deadhead Data

IMPELLER SIZE - DEADHEAD			
PUMP HEAD (m.w.g.)	21.1	11.9	11.9
DIFFERENTIAL PRESSURE (kPa)	207	117	117
SUCTION PRESSURE (kPa)	165	262	262
DISCHARGE PRESSURE (kPa)	372	379	379

Motor Data:

MAKE	WEG	WEG	WEG
SIZE (HP)	10.0	5.0	5.0
MOTOR RPM	1765	1800	1800
VOLTAGE/PHASE	575 / 3	575 / 3	575 / 3
AMPERAGE - NAMEPLATE	9.8	5.2	5.2
AMPERAGE - ACTUAL	9.1 @ VFD	4.6	4.6
FRAME	213 / 5TC	184JM	184JM

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, (3)Flow Measuring Device(s), (4)Performance Curve/Chart, (5)Element Temperature Drop(s), (6)Element Pressure Drop(s), N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & m.w.g. & kPa)

Template Name: PUMPM

K.D. ENGINEERING Co.

PUMP DATA

PAGE 9 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	P - 6A	P - 6B	P - 7A
LOCATION	MECH ROOM MR-2	MECH ROOM MR-2	MECH ROOM MR-2
EQUIPMENT/SYSTEM SERVED	HEX - 3	HEX - 3	RE-HEATING LOOP PUMP (SOURCE SIDE)
UNIT MAKE	B & G	B & G	B & G
UNIT MODEL	1.5AA	1.5AA	8020 BF
SERIAL NUMBER	700810	700810	701921A
IMPELLER SIZE - DOCUMENTED			3 X 3 X 11

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	2.5 (*1)	1.6 (*2)	2.5 (*1)	1.4 (*2)	17.6 (*1)	15.8 (*2)
PUMP HEAD (m.w.g.)	2.1 (*1)	6.4	2.1 (*1)	6.3	24.6	23.9
DIFFERENTIAL PRESSURE (kPa)		69		62		234
SUCTION PRESSURE (kPa)		337		262		55
DISCHARGE PRESSURE (kPa)		400		324		289

Deadhead Data

IMPELLER SIZE - DEADHEAD			
PUMP HEAD (m.w.g.)	7	7	30.9
DIFFERENTIAL PRESSURE (kPa)	69	69	303
SUCTION PRESSURE (kPa)	276	276	110
DISCHARGE PRESSURE (kPa)	345	345	313

Motor Data:

	P - 6A	P - 6B	P - 7A
MAKE	WEG	WEG	WEG
SIZE (HP)	0.5	0.5	10.0
MOTOR RPM	1750	1750	1765
VOLTAGE/PHASE	208 / 3	208 / 3	575 / 3
AMPERAGE - NAMEPLATE	1.6	1.6	9.8
AMPERAGE - ACTUAL	1.2	1.2	8.0
FRAME	B56C	B56C	213 / 5TC

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, (3)Flow Measuring Device(s), (4)Performance Curve/Chart, (5)Element Temperature Drop(s), (6)Element Pressure Drop(s), N/Av = Not Applicable, N/Av = Not Available, N/Av = Not Accessible

Project Number: 1110240

REV. A Date: 25/05/2004

Template Type: Metric (l/s & m.w.g. & kPa)

Template Name: PUMPM

K.D. ENGINEERING Co.

PUMP DATA

PAGE 10 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	P - 7B	P - 8A	P - 8B
LOCATION	MECH ROOM MR-2	MECH ROOM MR-2	MECH ROOM MR-2
EQUIPMENT/SYSTEM SERVED	RE-HEATING LOOP PUMP (SOURCE SIDE)	BOILER LOOP PRIMARY	BOILER LOOP PRIMARY
UNIT MAKE	B & G	B & G	B & G
UNIT MODEL	8020 BF	1 1/2 AA	1 1/2 AA
SERIAL NUMBER	701921A	700811	700811
IMPELLER SIZE - DOCUMENTED	3 X 3 X 11		

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	17.6 (*1) 16.5 (*2)	15.8 (*2)	2.5 (*1)	2.77 (*3)	2.5 (*1)	2.77 (*3)
PUMP HEAD (m.w.g.)	24.3	23.9	6.1	7	6.1	7
DIFFERENTIAL PRESSURE (kPa)		234		69		69
SUCTION PRESSURE (kPa)		55		117		117
DISCHARGE PRESSURE (kPa)		289		186		186

Deadhead Data

IMPELLER SIZE - DEADHEAD			
PUMP HEAD (m.w.g.)	30.9	7	7
DIFFERENTIAL PRESSURE (kPa)	303	69	69
SUCTION PRESSURE (kPa)	110	124	124
DISCHARGE PRESSURE (kPa)	313	193	193

Motor Data:

MAKE	WEG	WEG	WEG
SIZE (HP)	10.0	0.5	0.5
MOTOR RPM	1765	1760	1760
VOLTAGE/PHASE	575 / 3	208 / 3	208 / 3
AMPERAGE - NAMEPLATE	9.8	1.7	1.7
AMPERAGE - ACTUAL	8.0	1.1	1.1
FRAME	213 / 5TC	B56C	B56C

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, (3)Flow Measuring Device(s), (4)Performance Curve/Chart, (5)Element Temperature Drop(s), (6)Element Pressure Drop(s), N/As = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & m.w.g. & kPa)

Template Name: PUMPM

K.D. ENGINEERING Co.

PUMP DATA

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	P-9	P-10	P-11
LOCATION	MECH ROOM MR-2	MECH ROOM MR-2	MECH ROOM MR-2
EQUIPMENT/SYSTEM SERVED	WSHP-3 LOAD CIRC PUMP	WSHP-1 LOAD CIRC PUMP	WSHP-2 LOAD CIRC PUMP
UNIT MAKE	B & G	B & G	B & G
UNIT MODEL	SERIES 60 2 X 7	80S-BF 3X3X7B	80S-BF 3X3X7B
SERIAL NUMBER	702782	707723B	707722B
IMPELLER SIZE - DOCUMENTED			

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	5.7 (*1)	5.7 (*4)	8.5 (*1)	8.5 (*4)	8.5 (*1)	8.5 (*4)
PUMP HEAD (m.w.g.)	6.4	8.8	6.4	6.3	6.4	6.3
DIFFERENTIAL PRESSURE (kPa)		86		62		62
SUCTION PRESSURE (kPa)		128		159		128
DISCHARGE PRESSURE (kPa)		214		221		290

Deadhead Data

	P-9	P-10	P-11
IMPELLER SIZE - DEADHEAD		---	---
PUMP HEAD (m.w.g.)	N/AV	N/AV	N/AV
DIFFERENTIAL PRESSURE (kPa)	N/AV	N/AV	N/AV
SUCTION PRESSURE (kPa)	N/AV	N/AV	N/AV
DISCHARGE PRESSURE (kPa)	N/AV	N/AV	N/AV

Motor Data:

	P-9	P-10	P-11
MAKE	WEG	WEG	WEG
SIZE (HP)	1.5	1.5	1.5
MOTOR RPM	1760	1760	1760
VOLTAGE/PHASE	575 / 3	575 / 3	575 / 3
AMPERAGE - NAMEPLATE	1.6	1.6	1.6
AMPERAGE - ACTUAL	1.3/1.3/1.4	1.4/1.4/1.6	1.4/1.4/1.6
FRAME	145TC	145TC	145TC

** No discharge shut off valve

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, (3)Flow Measuring Device(s), (4)Performance Curve/Chart, (5)Element Temperature Drop(s), (6)Element Pressure Drop(s), N/Av = Not Available, N/AC = Not Accessible

Project Number: 1170240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & m.w.g. & kPa)

Template Name: PUMPM

K.D. ENGINEERING Co.

PUMP DATA

PAGE 12 OF 17
DATE: 28/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	P-14	P-15	CP - 1
LOCATION	MECH ROOM MR-2	MECH ROOM MR-2	MECH ROOM MR-2
EQUIPMENT/SYSTEM SERVED	WSHP-1 SOURCE CIRC PUMP	WSHP-2 SOURCE CIRC PUMP	HEAT PUMP HP-1 TO HP-5 CIRCULATION
UNIT MAKE	B & G	B & G	B & G
UNIT MODEL	80S-BF 3X3X7B	80S-BF 3X3X7B	80S1.5 X 7B
SERIAL NUMBER	707723B	707722B	707724A
IMPELLER SIZE - DOCUMENTED			

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	8.5 (*1)	8.8 (*4)	8.5 (*1)	8.5 (*4)	1.6 (*2)	1.5 (*3)
PUMP HEAD (m.w.g.)	6.4	6.3	6.4	6.3	12.8	14.0
DIFFERENTIAL PRESSURE (kPa)		62		62		138
SUCTION PRESSURE (kPa)		269		248		165
DISCHARGE PRESSURE (kPa)		331		310		303

Deadhead Data

IMPELLER SIZE - DEADHEAD			
PUMP HEAD (m.w.g.)	7.0	7.0	14
DIFFERENTIAL PRESSURE (kPa)	69	69	138
SUCTION PRESSURE (kPa)	278	269	165
DISCHARGE PRESSURE (kPa)	347	338	303

Motor Data:

MAKE	WEG	WEG	WEG
SIZE (HP)	1.5	1.5	1.0
MOTOR RPM	1760	1760	1750
VOLTAGE/PHASE	575 / 3	575 / 3	208 / 3
AMPERAGE - NAMEPLATE	1.6	1.6	3.3
AMPERAGE - ACTUAL	1.4 / 1.4 / 1.6	1.4 / 1.4 / 1.6	2.8 / 2.8 / 2.7
FRAME	145TC	145TC	143T

** No discharge isolation valve

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, (3)Flow Measuring Device(s), (4)Performance Curve/Chart, (5)Element Temperature Drop(s), (6)Element Pressure Drop(s), N/Av = Not Applicable, N/Av = Not Available, N/Av = Not Accessible

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & m.w.g. & kPa)

Template Name: PUMPM

K.D. ENGINEERING Co.

PUMP DATA

PAGE 13 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	CP - 2	CP - 3	CP - 4
LOCATION	MECH ROOM MR-2	MECH ROOM MR-2	MECH ROOM MR-2
EQUIPMENT/SYSTEM SERVED	HEAT PUMP HP-1 TO HP-5 CIRCULATION	WSHP - 3 SOURCE HRC CIRC PUMP	WSHP - 3 SOURCE HRC CIRC PUMP
UNIT MAKE	B & G	B & G	B & G
UNIT MODEL	80S1.5 X 7B	80S-BF 2.5 X 9.5B	80S-BF 2.5 X 9.5B
SERIAL NUMBER	707724B	707725B	707725A
IMPELLER SIZE - DOCUMENTED			

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	1.6 (*2)	1.5 (*3)	5.7 (*1)	5.4 (*3)	5.7 (*1)	5.4 (*3)
PUMP HEAD (m.w.g.)	12.8	14.0	22.9	23.3	22.9	23.3
DIFFERENTIAL PRESSURE (kPa)		138		228		228
SUCTION PRESSURE (kPa)		165		83		83
DISCHARGE PRESSURE (kPa)		303		311		311

Deadhead Data

IMPELLER SIZE - DEADHEAD			
PUMP HEAD (m.w.g.)	14	24.6	24.6
DIFFERENTIAL PRESSURE (kPa)	138	241	241
SUCTION PRESSURE (kPa)	165	372	372
DISCHARGE PRESSURE (kPa)	303	613	613

Motor Data:

MAKE	WEG	WEG	WEG
SIZE (HP)	1.0	5.0	5.0
MOTOR RPM	1750	1750	1750
VOLTAGE/PHASE	208 / 3	575 / 3	575 / 3
AMPERAGE - NAMEPLATE	3.3	5.2	5.2
AMPERAGE - ACTUAL	2.8 / 2.8 / 2.7	4.2 / 4.1 / 2.0	4.2 / 4.1 / 2.0
FRAME	143T	184 JM	184 JM

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, (3)Flow Measuring Device(s), (4)Performance Curve/Chart, (5)Element Temperature Drop(s), (6)Element Pressure Drop(s), N/Av = Not Applicable, N/Av = Not Available, N/Av = Not Accessible

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & m.w.g. & kPa)

Template Name: PUMPM

K.D. ENGINEERING Co.

PUMP DATA

PAGE 14 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	RP - 1		
LOCATION	MECH ROOM MR - 2		
EQUIPMENT/SYSTEM SERVED	DOMESTIC HOT WATER RECIRC.		
UNIT MAKE	B & G		
UNIT MODEL	1 X 5.25		
SERIAL NUMBER	702783		
IMPELLER SIZE - DOCUMENTED			

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
TOTAL FLOW (l/s)	1.3 (*1)	**				
PUMP HEAD (m.w.g.)	7.6	**				
DIFFERENTIAL PRESSURE (kPa)		**				
SUCTION PRESSURE (kPa)		**				
DISCHARGE PRESSURE (kPa)		**				

Deadhead Data

IMPELLER SIZE - DEADHEAD						
PUMP HEAD (m.w.g.)	**	**				
DIFFERENTIAL PRESSURE (kPa)	**	**				
SUCTION PRESSURE (kPa)	**	**				
DISCHARGE PRESSURE (kPa)	**	**				

Motor Data:

MAKE	B&G		
SIZE (HP)	0.5		
MOTOR RPM	1725		
VOLTAGE/PHASE	115 / 1		
AMPERAGE - NAMEPLATE	5.0		
AMPERAGE - ACTUAL	4.5		
FRAME	56		

** See Field Note

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, (3)Flow Measuring Device(s), (4)Performance Curve/Chart, (5)Element Temperature Drop(s), (6)Element Pressure Drop(s), N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & m.w.g. & kPa)

Template Name: PUMPM

K.D. ENGINEERING Co.

LIQUID FLOW MEASURING DEVICE DATA

PAGE 15 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	P - 1	P - 2	P - 6A
LOCATION	MECH ROOM	MECH ROOM	MECH ROOM
SERVICE	P - 1	P - 2	P - 6A
UNIT MAKE	TA	TA	TA
UNIT MODEL	2 1/2"	2 1/2"	1 1/2"

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
LIQUID FLOW (l/s)	17.0 (*1)	17.0 (*2)	17.0 (*1)	17.0 (*2)	2.5 (*1)	
DIFFERENTIAL PRESSURE (kPa)		54		54		8.1
DEVICE SETTING		8.0		8.0		4T
FLOW FACTOR						

Unit Identification:

TAG	P - 6B	P - 8A	P - 8B
LOCATION	MECH ROOM	MECH ROOM	MECH ROOM
SERVICE	P - 6B	P - 8A	P - 8B
UNIT MAKE	TA	TA	TA
UNIT MODEL	1 1/2"	2"	2"

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
LIQUID FLOW (l/s)	2.5 (*1)		2.5 (*1)	2.8 (*2)	2.5 (*1)	2.8 (*2)
DIFFERENTIAL PRESSURE (kPa)		8.1		6.0		6.0
DEVICE SETTING		4T		2.0		2.0
FLOW FACTOR						

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, N/Av = Not Applicable, N/Av = Not Available, N/Av = Not Accessible

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & kPa)

Template Name: LIQFLOW

K.D. ENGINEERING Co.

LIQUID FLOW MEASURING DEVICE DATA

PAGE 16 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	P - 14	P - 15	CP - 1
LOCATION	MR # 2	MR # 2	MR # 2
SERVICE	P - 14	P - 15	CP - 1
UNIT MAKE	TA	TA	TA
UNIT MODEL	3"	3"	2"

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
LIQUID FLOW (l/s)	8.5 (*1)	8.8 (*2)	8.5 (*1)	8.8 (*2)	1.4 (*1)	1.6 (*2)
DIFFERENTIAL PRESSURE (kPa)		6.6		6.6		3.3
DEVICE SETTING		8.0		8.0		4T
FLOW FACTOR						

Unit Identification:

TAG	CP - 2	CP - 3	CP - 4
LOCATION	MR # 2	MR # 2	MR # 2
SERVICE	CP - 2	CP - 3	CP - 4
UNIT MAKE	TA	TA	TA
UNIT MODEL	2"	2 1/2"	2 1/2"

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
LIQUID FLOW (l/s)	1.4 (*1)	1.6 (*2)	5.7 (*1)	5.4 (*2)	5.7 (*1)	5.4 (*2)
DIFFERENTIAL PRESSURE (kPa)		3.3		5.7		5.7
DEVICE SETTING		4T		8.0		8.0
FLOW FACTOR						

* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible

Project Number: 1110240

REV: A Date: 25/05/2004

Template Type: Metric (l/s & kPa)

Template Name: LIQFLO1M

K.D. ENGINEERING Co.

LIQUID FLOW MEASURING DEVICE DATA

PAGE 17 OF 17
DATE: 26/09/2012
REVISION: B
TECH: SL

TESTING AND BALANCING ANALYSIS REPORT

Unit Identification:

TAG	HRC - 1	HRC - 2	HEX - 1
LOCATION	MR # 2	MR # 1	MR # 2
SERVICE	HRC - 1	HRC - 2	HEX - 1
UNIT MAKE	TA	TA	TA
UNIT MODEL	NAC	2	2"

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
LIQUID FLOW (l/s)	2.6 (*1)	2.3 (**)	3.1 (*2)	3.1 (*2)	5.5 (*1)	5.0 (*2)
DIFFERENTIAL PRESSURE (kPa)		N/Ac		10.8		33.9
DEVICE SETTING		4.0		4.0		4.0
FLOW FACTOR						

Unit Identification:

TAG			
LOCATION			
SERVICE			
UNIT MAKE			
UNIT MODEL			

Operating Data:

	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL	SPECIFIED	ACTUAL
LIQUID FLOW (l/s)						
DIFFERENTIAL PRESSURE (kPa)						
DEVICE SETTING						
FLOW FACTOR						

** Can't access CBV due to pipe location, flow taken from pump total minus HRC - 2

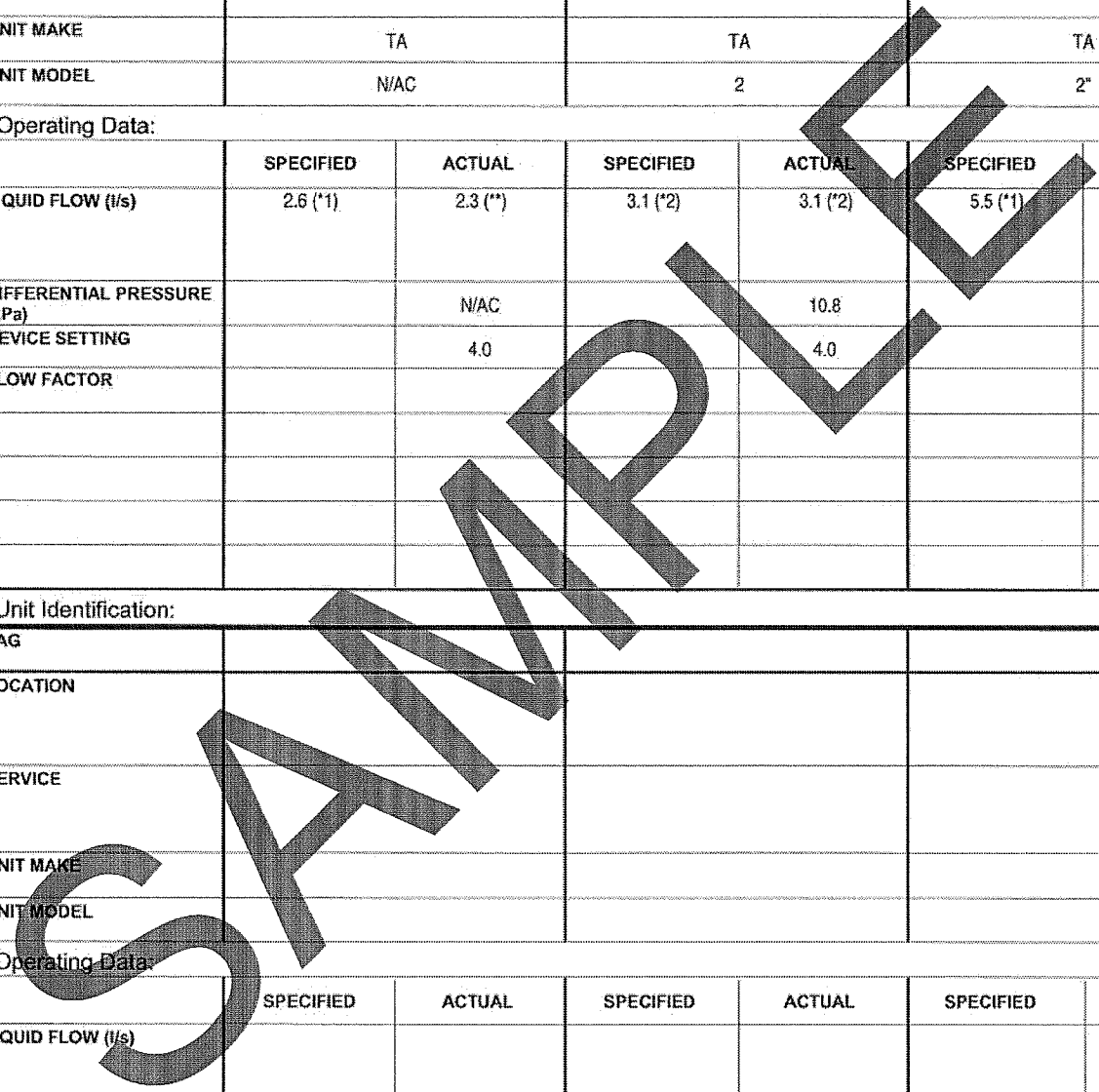
* Flow Specified/Determined by: (1)Mechanical Schedule, (2)Element Total, N/Ap = Not Applicable, N/Av = Not Available, N/Ac = Not Accessible

Project Number: 1110240

REV: A Date: 25/05/2004

Template Name: LIQFLOWM
Template Type: Metric (l/s & kPa)

K.D. ENGINEERING Co.





NORTH:

PROJECT:



DRAWING:

**BALANCING SCHEMATIC
GROUND FLOOR**

A REVISIONS FOR: (M) RETURN: SEP. 20/2012

REV. NOTES DATE

SCALE: N.T.S.

DRAWN: S.M.

DATE: AUGUST 21, 2012

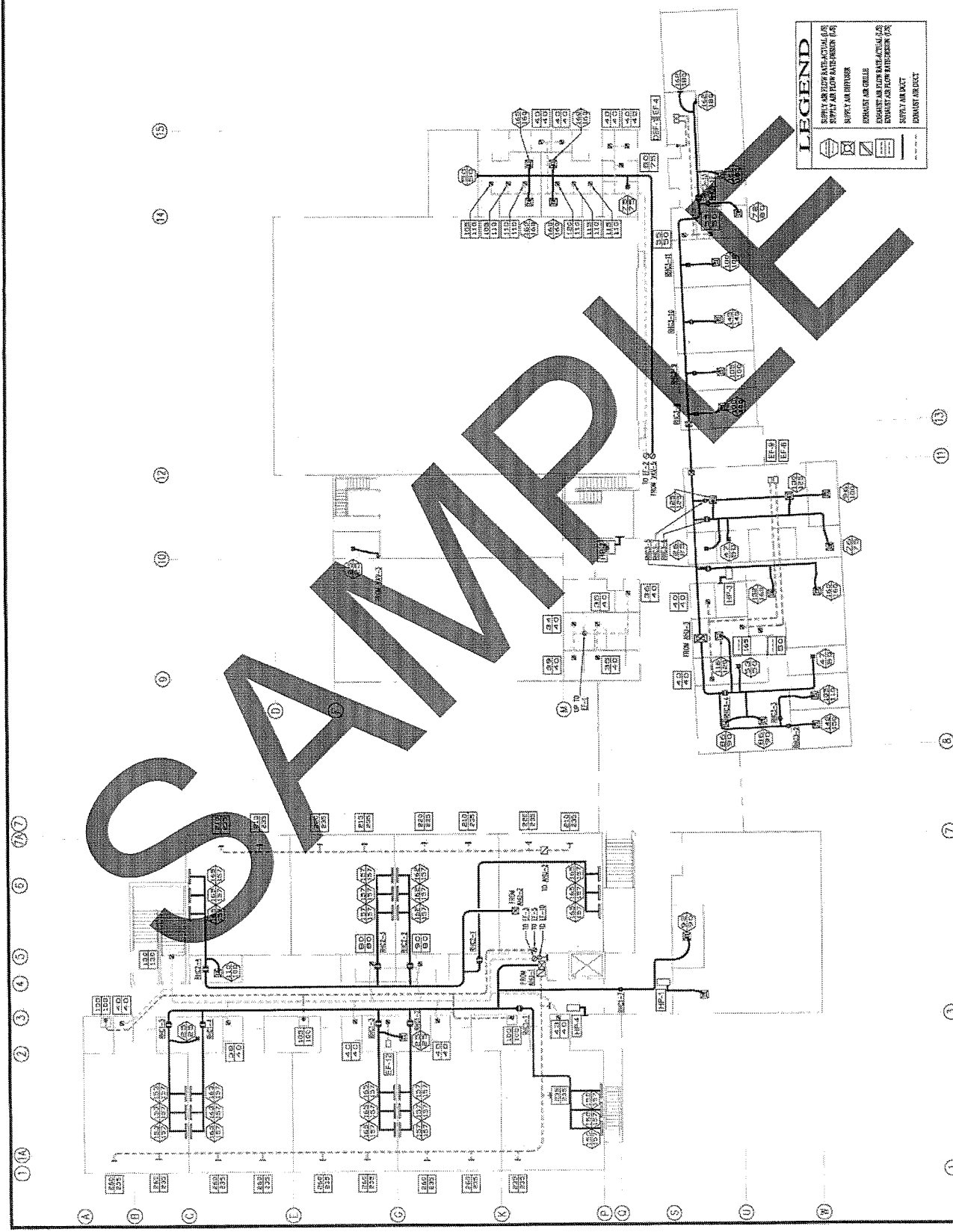
APPR:

SEAL:

K.D. PROJ. NO.:

1110240

DWG. NO. 1 of 2 REV. A





MECHANICAL ENGINEERS
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PHONE: 604-672-8851 FAX: 604-672-8853

NORTH:



PROJECT:



DRAWING:

BALANCING SCHEMATIC
SECOND FLOOR

REV. NOTES DATE

SCALE N.T.S.

DRAWN S.M.

DATE AUGUST 21, 2012

APPR.

SEAL:

K.D. PROJ. NO. 1110240

PAGE NO. 2 of 2

REV. A

