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Montreal, Friday, March 13, 2020

Canadian Coast Guard – Government of Canada

520 Exmouth Street
Sarnia, Ontario
N7T 8B1

Attention: Leslie Anne Veldman Leslie.Veldman@dfo-mpo.gc.ca

Subject: Certified Test, Adjust and Balance Report – Project C.S.S. Limnos

Ms. Veldman,

Attached you will find the balancing report for the C.S.S. Limnos project at 867 Lakeshore Road, Burlington, Ontario, which present the findings for the existing main supply fan, washroom exhaust, kitchen hood exhaust and the fume hood exhaust. These measurements were taken on February 26, 2020 by Air Audit Inc.

Below in Table 1.0, a summary of the airflows for these systems is displayed before the report begins on the following page.

System / Equipment	Aiflow (CFM)
Main Supply Air Fan	3357
Return Air	2612
Outside Air	745
Washroom Exhaust Fan	129
Kitchen Hood Exhaust Fan	483
Fume Hood Exhaust	0
Total Exhaust	612

Kind regards,
Morrison Air Conditioning Inc.

Mark DeAngelis

CERTIFIED TEST, ADJUST AND BALANCE REPORT

PREPARED ON: FEB.26/2020

BY:

AIR AUDIT INC. *Since 1987*

110 TURNBULL COURT, UNIT 11 CAMBRIDGE, ONTARIO N1T 1K6

PH(519)740-0871 FAX(519)740-1312

PROJECT: C.S.S. LIMNOS

LOCATION: 867 LAKESHORE ROAD, BURLINGTON ONT.

CONTENTS: AIRFLOW SURVEY FOR THE EXISTING MAIN SUPPLY FAN,
WASHROOM EXHAUST, KITCHEN HOOD EXHAUST AND THE
FUME HOOD EXHAUST.

CERTIFIED MEMBER OF THE NATIONAL ENVIRONMENTAL BALANCING BUREAU



NEBB CERTIFICATION

PROJECT: C.S.S LIMNOS

LOCATION: 867 LAKESHORE ROAD BURLINGTON, ONTARIO

DATE: FEB. 26/2020

The data presented in this report is an exact record of system(s) performance and was obtained in accordance with the National Environmental Balancing Bureau Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.

Any variances from the design quantities which do not meet the specifiers tolerances are noted throughout the report.

SUBMITTED AND CERTIFIED BY NEBB CERTIFIED BALANCING CONTRACTOR

AIR AUDIT INC.
110 TURNBULL COURT, UNIT 11 CAMBRIDGE, ONTARIO
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PH # (519)740-0871
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NEBB REGISTRATION # 2779

TAB SUPERVISOR BRENT LIPSIT



NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB)

AIR AUDIT INC.

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SUMMARY OF FINDINGS FOR AIR SYSTEMS Feb. 26/2020

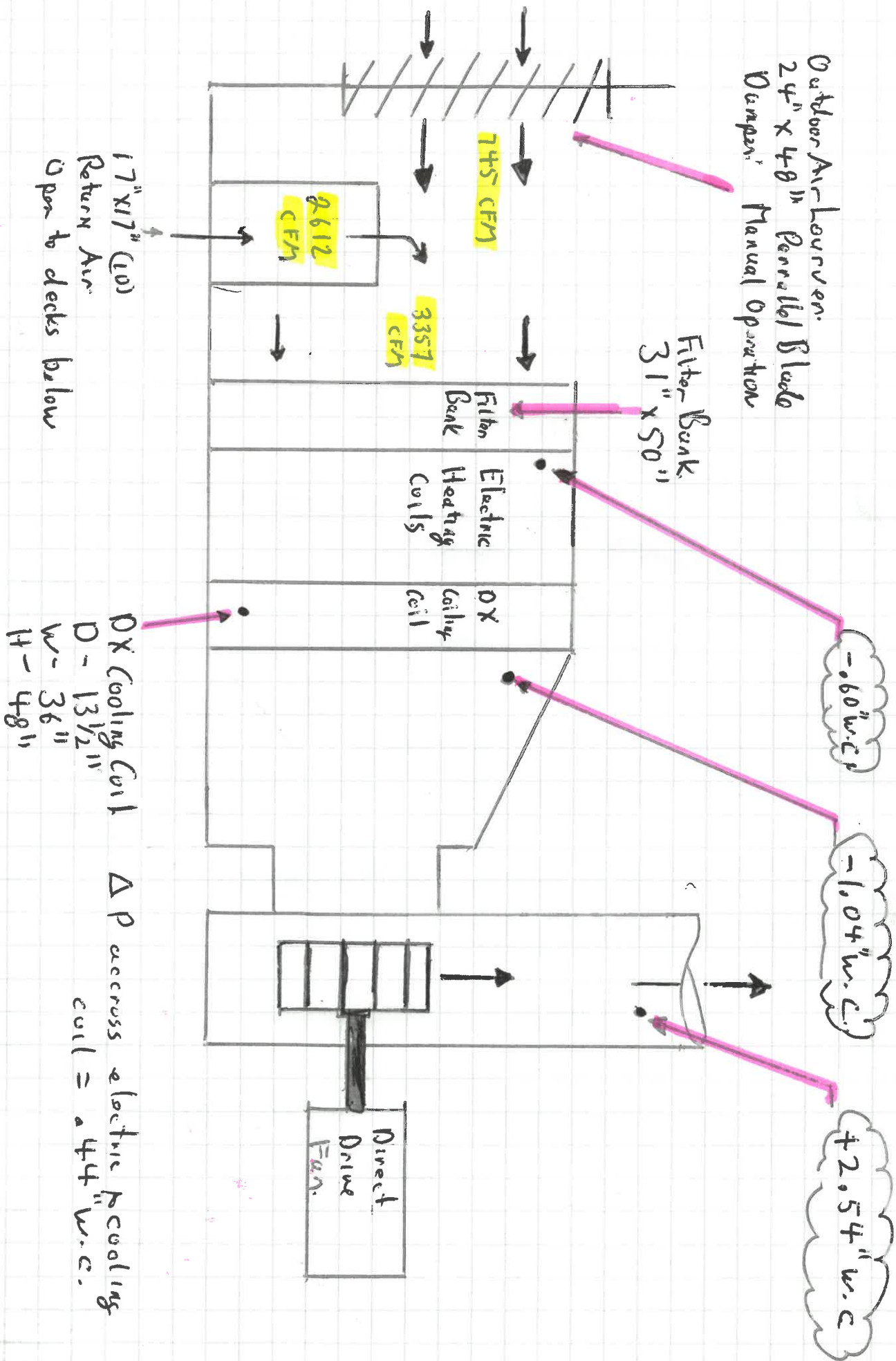
<u>EQUIPMENT</u>	<u>ACTUAL CFM</u>
Main Supply Air Fan	3357
Washroom Exhaust Fan	129
Kitchen Hood Exhaust Fan	483
Fume Hood Exhaust	NIL

Note : the Bridge has an additional AC System on the upper deck which is tied into the existing duct work with a manual damper to isolate it when used .

FOR MORE DETAILED INFORMATION SEE FAN REPORTS

Certified Member of the National Environmental Balancing Bureau (NEBB)

MAIN AIR HANDLER PROFILE---CFM and Static Pressure



FAN EQUIPMENT TEST REPORT

Submitted by Air Audit Inc-Cambridge Ont.

PROJECT: C.S.S. LIMNOS

LOCATION:

867 LAKESHORE ROAD
BURLINGTON, ONTARIO

SYSTEM: MAIN SUPPLY AIR FAN

EQUIPMENT LOCATION: MECH. ROOM

UNIT MANUFACTURER: CANADIAN BLOWER
AND FORGE

DATE: FEB. 26/2020

MODEL or SIZE: 445 CLASS 2

	<i>DESIGN</i>	<i>ACTUAL</i>
TOTAL CFM	NA	3357
MIN. O.A. CFM	NA	(CLOSED) 745
RETURN CFM	NA	2612
SUC S.P. - "W.C.	NA	1.04
DISC S.P. +"W.C.	NA	2.54
TOTAL EXT. S.P "W.C.	NA	3.58
FAN RPM		NA
FAN PULLEY		DIRECT
# OF BELTS & SIZE		NONE
AIR FILTERS CONDITION	VERY DIRTY X VERY CLEAN	

COMMENTS

TOTAL AIR DETERMINED BY MEASUREING FILTER BANK VELOCITY WITH ADM W/VELGRID.

MOTOR NAMEPLATE INFORMATION IS NOT AVAILABLE PAINTED OVER.

OUTSIDE AIR IS SUPPLIED THROUGH A PARALLEL BLADE DAMPER 24" X 48" AND IS CONTROLLED MANUALLY.

FAN MOTOR DATA

MANUFACTURER: NA
MODEL or FRAME: NA

DAMPER CLOSED FOR WINTER O/A CALCULATED TO BE 745CFM.

	<i>DESIGN</i>	<i>ACTUAL</i>
MOTOR H.P.		NA
BRAKE H.P.		
		L-1 9.0
AMPERAGE and S.F.		L-2 9.0
		L-3 9.0
VOLTAGE and PHASE		NA
RPM		NA
MOTOR PULLEY		DIRECT
PULLEY TYPE		NONE
ADJUSTABLE SETTING	FULL CLOSED FULL OPEN	
O.L. PROTECTION		

FILTER BANK = 31" X 50"
FILTER AK = 13 1/2 X 23 1/2 X 4 = 8.81 SQ. FT.
FPM = 381
CFM = 3357

RETURN THROUGH 17" X 17" FLOOR TRANSFER GRILLE
AK = 2.0 SQ. FT.
FPM = 1306
CFM = 2612

UNABLE TO TEST MOTOR VOLTAGE AS THERE IS NO ACCESS TO DISCONNECT WITHOUT TURNING OFF POWER (AMPERAGE TAKEN OFF AMP READOUT).

AIR OUTLET TEST REPORT

Submitted by Air Audit Inc-Cambridge Ont.

PROJECT: C.S.S. LIMNOS

SYSTEM: MAIN SUPPY AIR FAN

TEST INSTRUMENT: ALNOR RVA 801 & ADM 860 W/AIRFOIL

DATE: FEB. 26/2020

AREA SERVED	OUTLET DATA				DESIGN		TEST	TEST	TEST	FINAL	
	#	TYPE	SIZE	AK	VEL	CFM	# 1	# 2	# 3	VEL	CFM
BRIDGE DECK											
BRIDGE	1	GRILLE	10 X 4	0.22	NA	NA	398			398	88
BRIDGE	2	GRILLE	10 X 4	0.22	NA	NA	488			488	107
BRIDGE	3	GRILLE	10 X 4	0.22	NA	NA	880			880	194
BRIDGE	4	GRILLE	10 X 4	0.22	NA	NA	460			460	101
FORECASTLE DECK											
ICS LOCKER	5	DIFF	11"	0.06	NA	NA	425			425	26
CABIN #1	6	GRILLE	10 X 4	0.22	NA	NA	262			262	58
CABIN #2	7	GRILLE	10 X 4	0.22	NA	NA	489			489	108
CABIN #3	8	GRILLE	10 X 4	0.22	NA	NA	573			573	126
MAIN DECK											
LAB AREA	9	GRILLE	10 X 4	0.22	NA	NA	428			428	94
LAB AREA	10	GRILLE	10 X 4	0.22	NA	NA	373			373	82
LAB AREA	11	GRILLE	10 X 4	0.22	NA	NA	398			398	88
CABIN #16	12	GRILLE	10 X 4	0.22	NA	NA	675			675	149
CABIN # 15	13	GRILLE	10 X 4	0.22	NA	NA	697			697	153
TANK TOP											
CABIN #4	14	GRILLE	10 X 4	0.22	NA	NA	486			486	107
CABIN #5	15	GRILLE	10 X 4	0.22	NA	NA	648			648	143
CABIN #6	16	GRILLE	10 X 4	0.22	NA	NA	702			702	154
CABIN #7	17	GRILLE	10 X 4	0.22	NA	NA	364			364	80
GALLEY	18	DIFF	9"	0.10	NA	NA	280			280	28
GALLEY	19	DIFF	9"	0.10	NA	NA	120			120	12
OFFICER MESS	20	GRILLE	10 X 4	0.22	NA	NA	747			747	164
OFFICER MESS	21	GRILLE	10 X 4	0.22	NA	NA	265			265	58
OFFICER MESS	22	GRILLE	10 X 4	0.22	NA	NA	355			355	78
CREW MESS	23	GRILLE	10 X 4	0.22	NA	NA	738			738	162
CABIN #9	24	GRILLE	10 X 4	0.22	NA	NA	350			350	77
CABIN #8	25	GRILLE	10 X 4	0.22	NA	NA	310			310	68
CABIN #11	26	GRILLE	10 X 4	0.22	NA	NA	481			481	106
CABIN #13	27	GRILLE	10 X 4	0.22	NA	NA	257			257	57
CABIN #10	28	GRILLE	10 X 4	0.22	NA	NA	332			332	73
CABIN #14	29	GRILLE	10 X 4	0.22	NA	NA	502			502	110

REMARKS-

- LOCATION DAMPER SERVING BRIDGE DECK TESTED OPEN. (THERE IS A FAIRAMOUNT OF AIR LEAKAGE COMING FROM DAMPER)
- OUTLETS #5,18 & 19 ARE 9" DIFFUSERS WITH A DAMPER RESTIRCTING AIRFLOW LEAVING ONLY A 1/2" SLOT FOR AIRFLOW. AK WAS CALCULATED BY USING THE CIRCUMFERENCE AND WIDTH OF OPENING.

AIR OUTLET TEST REPORT

Submitted by *Air Audit Inc-Cambridge Ont.*

PROJECT: C.S.S. LIMNOS

SYSTEM: MAIN SUPPY AIR FAN

TEST INSTRUMENT: ALNOR RVA 801 &
ADM 860 W/AIRFOIL

DATE: FEB. 26/2020

AREA SERVED	OUTLET DATA			AK	DESIGN		TEST	TEST	TEST	FINAL	
	#	TYPE	SIZE		VEL	CFM	# 1	# 2	# 3	VEL	CFM
CABIN #12	30	GRILLE	10 X 4	0.22	NA	NA	222			222	49
STORAGE	31	OED	5"	0.14	NA	NA	573			573	80
UTILITY	32	DIFF	9"	0.05	NA	NA	60			60	3

REMARKS-
- TOTAL AIRFLOW BY SUM OF THE OUTLETS IS 2973 CFM.

FAN EQUIPMENT TEST REPORT

Submitted by Air Audit Inc-Cambridge Ont.

PROJECT: C.S.S. LIMNOS

LOCATION:

867 LAKESHORE ROAD
BURLINGTON, ONTARIO

SYSTEM: WASHROOM EXHAUST FAN

EQUIPMENT LOCATION: MECH. ROOM

UNIT MANUFACTURER: CANADIAN BLOWER
AND FORGE

DATE: FEB. 26/2020

MODEL or SIZE: 365 EL

	<i>DESIGN</i>	<i>ACTUAL</i>
TOTAL CFM	NA	129
SUC S.P. - "W.C.		2.4
DISC S.P. +"W.C.		0.35
TOTAL EXT. S.P "W.C.	NA	2.75
FAN RPM		1735
FAN PULLEY		DIRECT
# OF BELTS & SIZE		NONE
AIR FILTERS CONDITION	VERY DIRTY VERY CLEAN	

COMMENTS

TOTAL AIR DETERMINED BY THE SUM OF THE INLETS.

UNABLE TO TEST MOTOR AMPS & VOLTAGE AS THERE IS NO ACCESS TO THE DISCONNECT WITHOUT TURNING OFF POWER.

FAN MOTOR DATA

MANUFACTURER:

TAMPER

MODEL or FRAME:

184

	<i>DESIGN</i>	<i>ACTUAL</i>
MOTOR H.P.	1.5	1.5
BRAKE H.P.		NA
		L-1 NA
AMPERAGE and S.F.	2.5/1.15-3	L-2 NA
		L-3 NA
VOLTAGE and PHASE	440	NA
RPM	1735	1735
MOTOR PULLEY		DIRECT
PULLEY TYPE		NONE
ADJUSTABLE SETTING	FULL CLOSED FULL OPEN	
O.L. PROTECTION		

AIR OUTLET TEST REPORT

Submitted by Air Audit Inc-Cambridge Ont.

PROJECT: C.S.S. LIMNOS

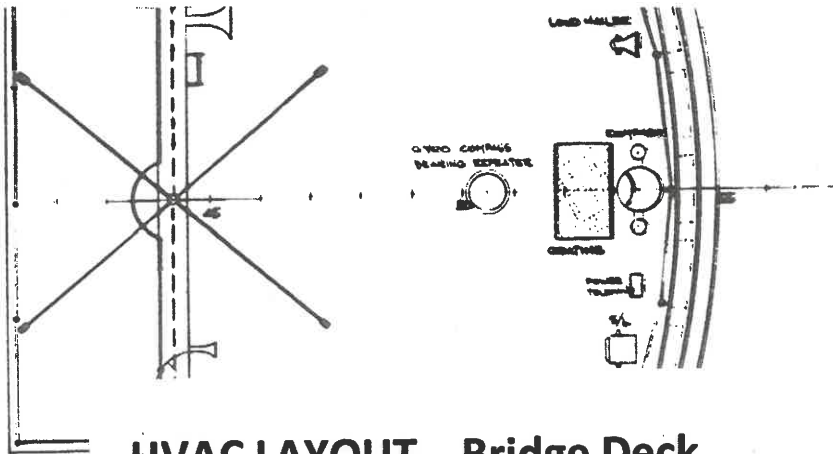
SYSTEM: WASHROOM EXHAUST

TEST INSTRUMENT: ALNOR RVA 801 & ADM 860 W/AIRFOIL

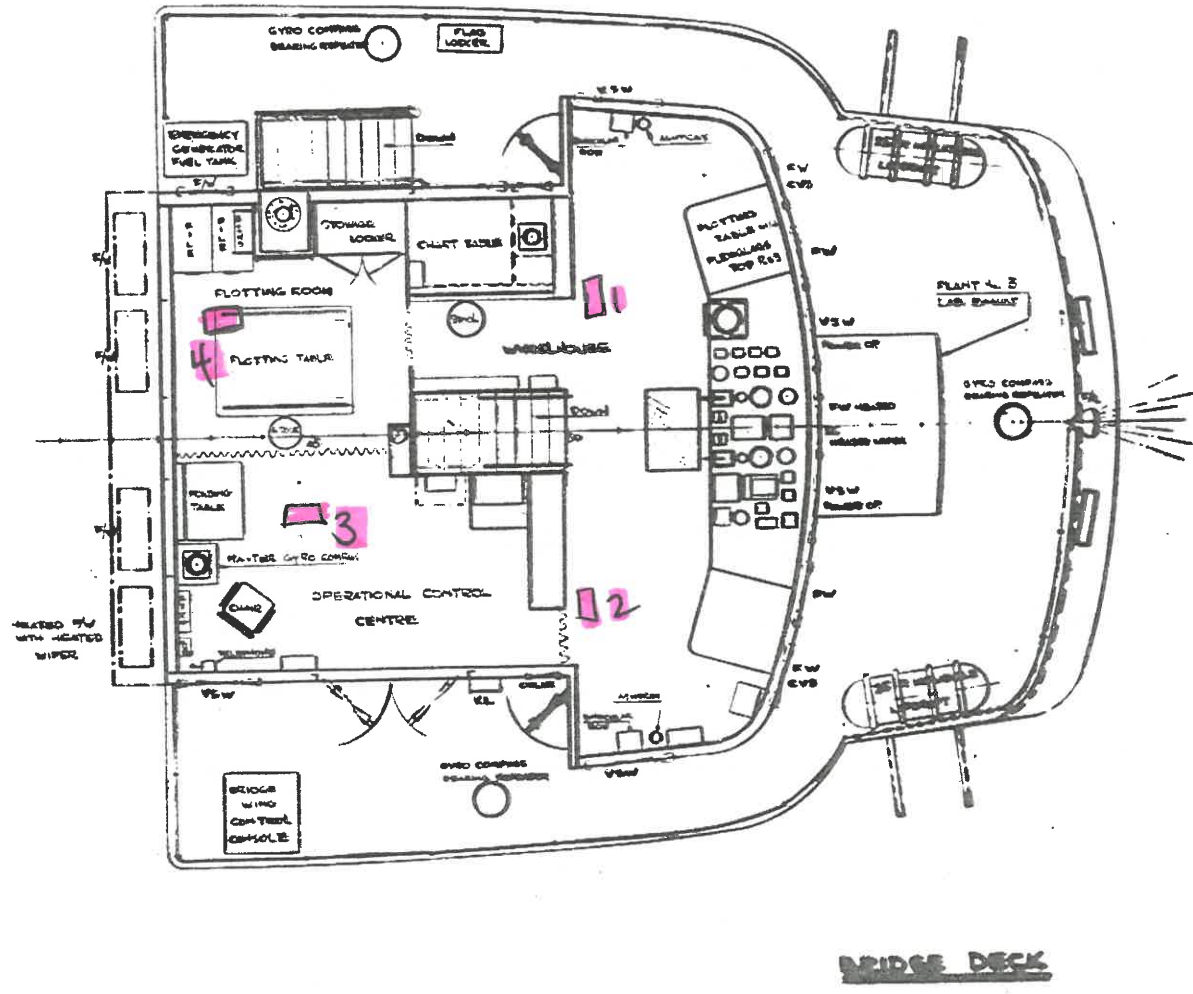
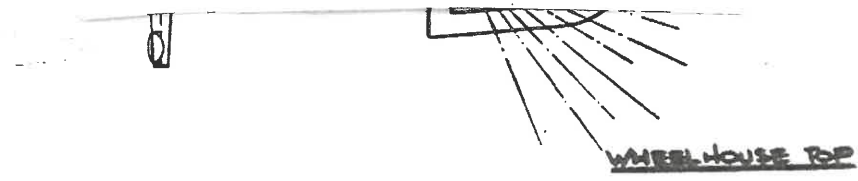
DATE: FEB. 26/2020

AREA SERVED	OUTLET DATA			AK	DESIGN		TEST	TEST	TEST	FINAL	
	#	TYPE	SIZE		VEL	CFM	# 1	# 2	# 3	VEL	CFM
FORECASTLE DECK											
W/R	E1	GRILLE	14 X 2	0.16	NA	NA	67			67	11
W/R	E2	GRILLE	14 X 2	0.16	NA	NA	126			126	20
CABIN #3 W/R	E3	GRILLE	14 X 2	0.16	NA	NA	88			88	14
MAIN DECK											
W/R	E4	GRILLE	14 X 2	0.16	NA	NA	0			0	0
TANK TOP											
CABIN #4/6 W/R	E5	GRILLE	14 X 2	0.16	NA	NA	111			111	18
CABIN #5 W/R	E6	GRILLE	14 X 2	0.16	NA	NA	0			0	0
SHOWER	E7	GRILLE	14 X 2	0.16	NA	NA	0			0	0
SHOWER	E8	GRILLE	14 X 2	0.16	NA	NA	115			115	18
W/R	E9	GRILLE	14 X 2	0.16	NA	NA	49			49	8
W/R	E10	GRILLE	14 X 2	0.16	NA	NA	84			84	13
BOOT ROOM	E11	GRILLE	14 X 2	0.16	NA	NA	168			168	27

REMARKS-

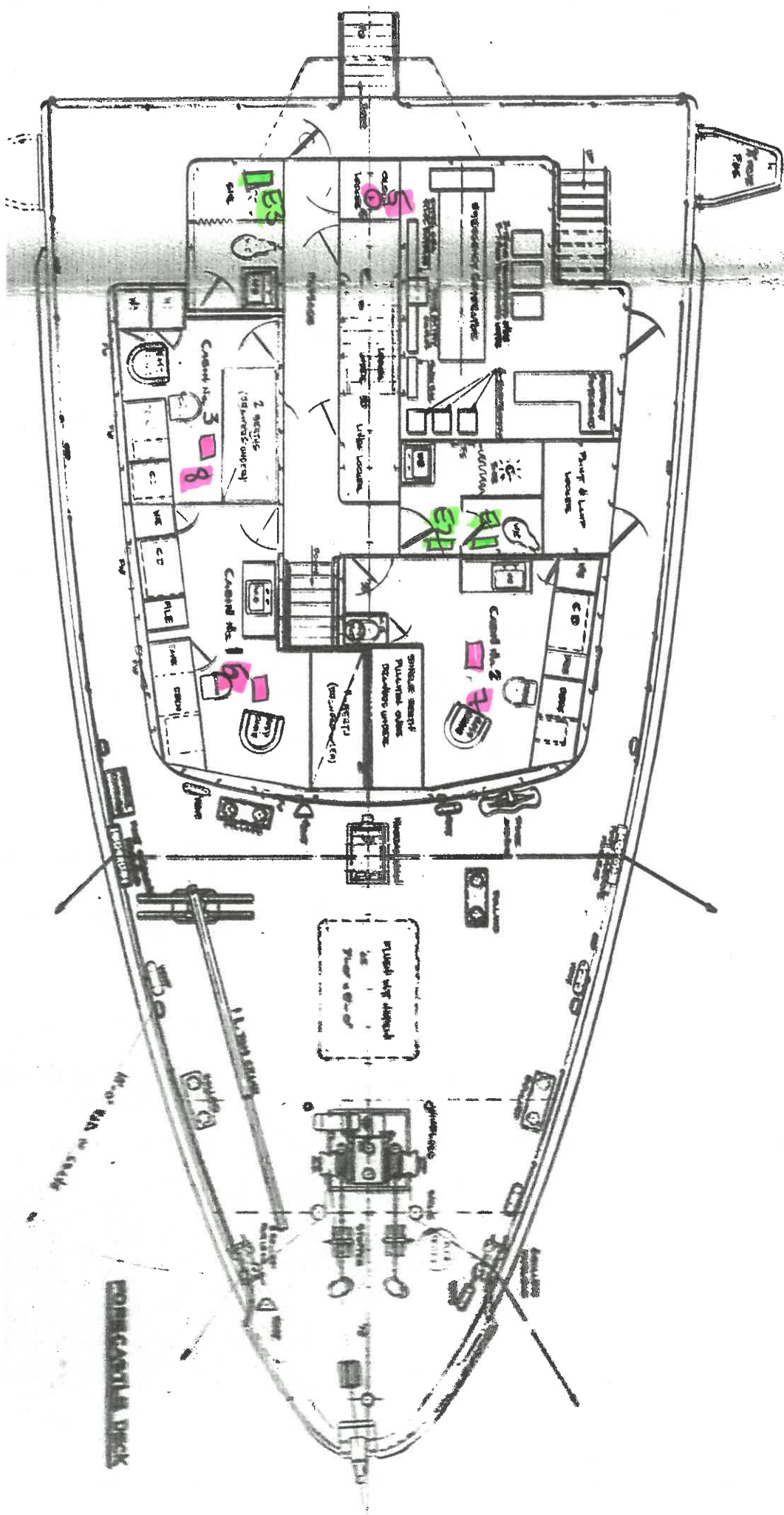


HVAC LAYOUT---Bridge Deck



C.S.S. LIMNOS

HVAC LAYOUT—Forecastle Deck



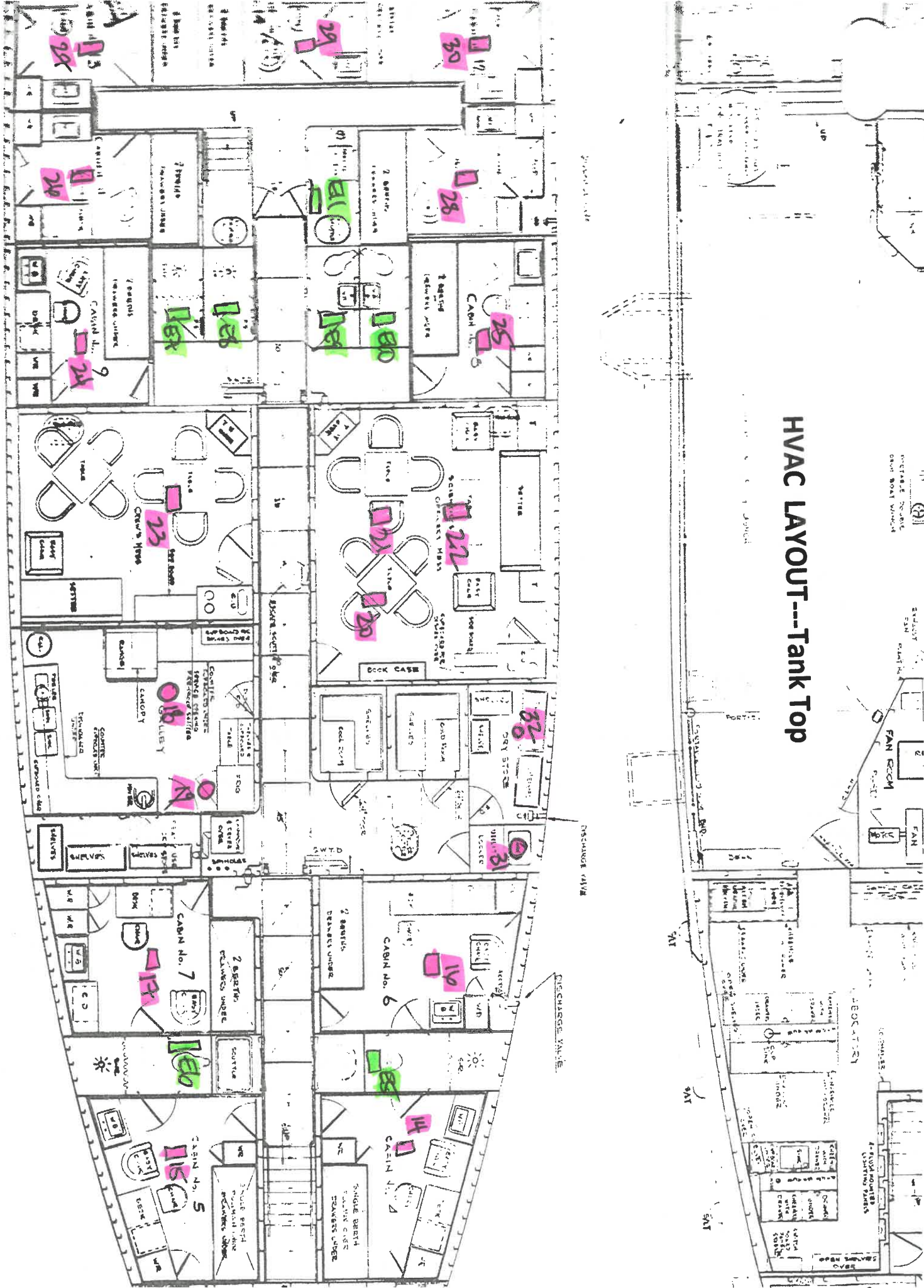
HVAC LAYOUT---Main Deck



MAIN DECK

11-82
R.D. or Seal

HVAC LAYOUT---Tank Top



FAN EQUIPMENT TEST REPORT

Submitted by Air Audit Inc-Cambridge Ont.

PROJECT: C.S.S. LIMNOS

LOCATION:

867 LAKESHORE ROAD
BURLINGTON, ONTARIO

SYSTEM: KITCHEN HOOD EXHAUST FAN

EQUIPMENT LOCATION: ROOF

UNIT MANUFACTURER: NA

DATE: FEB. 26/2020

MODEL or SIZE: NA

	<i>DESIGN</i>	<i>ACTUAL</i>
TOTAL CFM	NA	483
SUC S.P. - "W.C.		NA
DISC S.P. +"W.C.		NA
TOTAL EXT. S.P "W.C.	NA	NA
FAN RPM		NA
FAN PULLEY		DIRECT
# OF BELTS & SIZE		NONE
AIR FILTERS CONDITION	VERY DIRTY	VERY CLEAN

COMMENTS

TOTAL AIR DETERMINED BY THE MEASUREMENT ACROSS THE GREASE FILTER INLET BANK USING THE ADM 860 W/VELGRID.

SIZE = 29 1/2 X 18
AK = 4.43 SQ. FT.
REQ FPM = NA
ACT'L FPM = 109
CFM = 483

FAN MOTOR DATA

MANUFACTURER: NA
MODEL or FRAME: NA

FAN IS LOCATED ABOVE CEILING WITH NO ACCESS, UNABLE TO OBTAIN MANUFACTURER MODEL AND MOTOR DATA.

FAN RUNS CONTINUOUS 24/7.

	<i>DESIGN</i>	<i>ACTUAL</i>
MOTOR H.P.		NA
BRAKE H.P.		NA
AMPERAGE and S.F.	NA-NA	L-1 NA L-2 L-3
VOLTAGE and PHASE	NA	NA
RPM		NA
MOTOR PULLEY		DIRECT
PULLEY TYPE		NONE
ADJUSTABLE SETTING	FULL CLOSED	FULL OPEN
O.L. PROTECTION		NA

FAN EQUIPMENT TEST REPORT

Submitted by Air Audit Inc-Cambridge Ont.

PROJECT: C.S.S. LIMNOS

LOCATION:

867 LAKESHORE ROAD
BURLINGTON, ONTARIO

SYSTEM: FUME HOOD EXHAUST

EQUIPMENT LOCATION: ROOF

UNIT MANUFACTURER: JMP

DATE: FEB. 26/2020

MODEL or SIZE: F-100-36-MOD

	<i>DESIGN</i>	<i>ACTUAL</i>
TOTAL CFM		NIL
SUC S.P. - "W.C.		
DISC S.P. +"W.C.		
TOTAL EXT. S.P "W.C.		
FAN RPM		
FAN PULLEY		
# OF BELTS & SIZE		
AIR FILTERS CONDITION	VERY DIRTY VERY CLEAN	

COMMENTS

FAN IS RUNNING BUT THERE IS NO MEASUREABLE AIRFLOW PRESENT.

FAN MOTOR DATA

MANUFACTURER: _____

MODEL or FRAME: _____

	<i>DESIGN</i>	<i>ACTUAL</i>
MOTOR H.P.		
BRAKE H.P.		
AMPERAGE and S.F.		L-1
		L-2
		L-3
VOLTAGE and PHASE		
RPM		
MOTOR PULLEY		
PULLEY TYPE		
ADJUSTABLE SETTING	FULL CLOSED FULL OPEN	
O.L. PROTECTION		