EVALUATION OF THE POTENTIAL FOR FUEL-FIRED APPLIANCE BACKDRAFT IN TEN HOUSES EQUIPPED WITH WHOLE-HOUSE EXHAUST FANS.

A Report

Submitted to

Canada Mortgage and Housing Corporation

Submitted by

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EXECUTIVE SUMMARY

Buchan, Lawton, Parent Ltd., under contract to Canada Mortgage and Housing Corporation, evaluated the safety of operating combustion devices in ten homes in Nova Scotia. As the project was conceived, all houses selected for study were thought to have whole-house ventilation systems in place. There were no whole-house exhaust systems installed in two of the ten houses at the time of testing. Such exhaust fans are gaining increasing popularity and there is concern that the depressurization they create could increase the risk of backdrafting of combustion devices in homes.

The houses studied in this project were evaluated using several tests. A fan depressurization test (CGSB Standard CAN 2 149.10 M86) was used to evaluate the air leakage characteristics of the building envelope. The CMHC Combustion Safety Backdraft Checklist (December, 1984 version) was used to estimate the depressurization levels in the vicinity of the combustion devices in the homes, as well as determining whether or not combustion devices were, indeed, backdrafted by installed fan power in the home. The depressurization levels obtained were compared to CMHC's house depressurization limits (HDL's) to formulate conclusions on the combustion systems in the homes. With the depressurization fan door the house was also systematically depressurized to actually cause a backdraft to occur in the combustion systems. In this way, it was possible to comment on the house depressurization limits for various combustion devices.

Aside from the testing mentioned above, the houses were also visually inspected to determine if, indeed, they required exhaust fans as a means of moisture control. Signs of high internal humidities, moisture damage, evidence of condensation, etc., were noted such that a determination of a need for whole-house ventilation could be made. These findings were also utilized in determining appropriate strategies for ensuring adequate supplies of combustion air to all appliances in the home.

Of the ten houses tested, five were capable of obtaining depressurization levels in excess of HDL's under the unlikely scenario of all fans operating at the same time. Under the far more likely scenario of the whole house fan operating in conjunction with one other fan, three houses still exceeded the HDL. Remedial action was suggested in these three houses.

At a minimum, the home occupants should be informed of this problem and the exhaust fans labelled indicating that the operation of the whole-house exhaust fan in conjunction with one other fan could cause backdrafting of

the woodstove. The installation of a make-up air inlet to limit house pressures or interlocking the wiring of the fans, such that only one fan can be operated at any one time, would be more foolproof solutions.

Of the ten houses tested, only two houses had installed fan capacity capable of backdrafting the combustion device at the time of testing. From research on a broad base of houses, this test appears to be a far less reliable indicator than measuring house pressures. The chances of being on-site at a time when a house is most vulnerable to backdrafting is quite low so the comparison of results from this test are quite unreliable.

Only one house in the sample of houses tested had widespread moisture damage and actually appeared to require ventilation for moisture control purposes. Pressures in this house (House 3) would exceed HDL's with just the whole-house fan and the range fan operating. Anticipating some use of the whole-house fan, it is recommended that this house be equipped with a properly sized make-up air duct or a fan control interlock (such that the range and whole-house fans cannot operate simultaneously) to control house pressures.

If there is a desire to operate fans in the other houses where depressurization may be a problem, similar consideration should be given to the need to limit pressures and/or provide combustion air to the woodstoves and naturally-aspirated furnaces.

ACKNOWLEDGMENTS

We would like to extend our thanks to local housing agents and CMHC officials for their cooperation throughout this project. Their help in making site visit arrangements with home occupants/owners greatly assisted those carrying out the field work for this project.

1.0 INTRODUCTION

This report presents the findings of a project designed to evaluate the backdraft potential of fuel-fired appliances caused by house exhaust fan systems. When the project was conceived, all houses chosen for the study were thought to have central fan exhaust systems in place for moisture control. The houses were selected for the study by CMHC Halifax branch. Of the houses CMHC Halifax branch selected, two did not have whole-house fans installed. Nevertheless, other exhaust fans were in place, so these houses were included in the study.

Tests were performed to determine house characteristics as they related to the use of exhaust fans and their impact on the potential for backdrafting of combustion devices. This report summarizes the findings of the testing and inspection of a total of ten houses in various locations in Nova Scotia.

All houses tested were of wood frame construction and from two to three years old. Table I provides a brief description of the units and lists their heating systems and exhaust systems. The in-house locations of these systems are included in Appendix A.

Field testing was performed by Gary O'Connor, P.Eng., of Buchan, Lawton, Parent Ltd. (assisted by a technician). The test work was done between January 27 and February 2, 1986. In several instances, local housing authorities were present during the tests.

Table I HOUSE DESCRIPTIONS

House No.	Occupant	House[1] Type	Floor Area (m^2)	Space[2] Heating	Exhaust[3] System
1	Turner	B	147	E + W	A + CD
2	Sherrard	B	131	E + W	A
3	Cochrane	B	143	E + W	A
4	McCarthy	B	144	E + W	A
5	MacDonald	B	162	FA	A + FB
6	Deveau	B	149	E + W	A + CD
7	Melanson	1 1/2	107	E + W	A + CD
8	Ambrose	1 1/2	107	E + W	A + CD
9	Titus	B	146	E + W	CD
10	Logan	B	132	FA + W	FB

Notes:

1 B = Bungalow, 1 1/2 = Storey and one-half

2 E = Electric Baseboard, FA = Forced Air (Oil), W = Woodstove

3 All units have an electric range fan and a bathroom fan; listed are the additional exhaust systems.

A = Aston Fan CD = Clothes Dryer FB = Furnace Blower

2.0 METHODOLOGY

All houses in the sample were assessed in the following manner:

1. A depressurization test was performed to determine the air leakage characteristics of the building envelope.
2. A backdraft test was used to examine the interaction between the installed exhaust fan capacity and combustion devices in the home.
3. A visual inspection was performed to assess the need for central house exhaust fans as a means of moisture control.

Each assessment was performed using the protocol detailed below.

2.1 Fan Depressurization Tests

The fan depressurization tests were performed in accordance with the CGSB Draft Standard CAN 2-149.10-M86 (11th. draft), Determination of Air-Tightness of Buildings by the Fan Depressurization Method. The field notes from the testing can be found in Appendix B.

The fan unit used for the fan depressurization tests was a Retrotec model RDF 501 depressurization door fan. The unit was last calibrated in the summer of 1985.

The records of the climatic conditions during the testing, necessary for the calculations or for the interpretation of test data, were obtained from weather stations in the vicinity of the test sites.

The CGSB Standard recommends that testing not be performed under windspeeds greater than 20 km/h. The windspeed at the house location was checked at the time of testing.

2.2 Backdraft Tests

Backdraft testing was performed using CMHC's Combustion Safety Backdraft Checklist (December 1984 version). The five part procedure is outlined briefly on the following page. Additional testing was done in parts 2 and 5 of the procedure to determine the amount of depressurization caused by the individual exhaust systems, and to measure the backdraft pressures of cold and warm flues.

Part 1 - Chimney Inspection
Each chimney and appliance was inspected in order to identify any malfunctions caused by wear or poor maintenance which could affect the backdraft test results and to determine if the installations conformed to the code.

Part 2 - Furnace Room Vent/Pressure Test
This test was performed in the two houses which had forced-air furnaces. An inclined manometer pressure gauge measured the extent of house depressurization when all the exhaust systems were operating. The manometer was placed close to the fuel-fired appliance being tested and outside pressures were averaged by placing taps on all four walls of the units. House depressurization pressures were then compared to the accepted levels given by the procedure. From this information, a judgement could be made as to whether the exhaust systems were capable of backdrafting the forced-air furnaces (ie., whether the depressurization exceeded the house depressurization limits HDL's).

With the additional tests, the amount of depressurization caused by each individual exhaust system was measured, and by using the depressurization door fan, it was possible to measure the pressure required to backdraft the cold and hot flues of combustion devices in the home. This data was useful in judging the extent to which given exhaust systems were likely to backdraft cold flues and the individual "worst case" senarios.

Part 3 - Heat Exchanger Leakage
In this test the two forced-air furnaces were checked with an air current tester (smoke pencil) to determine if there was any leakage across the heat exchanger walls.

Part 4 - Furnace Room Spillage
With all the exhaust systems in the house operating, the forced-air furnaces were checked to see if combustion products spilled into the house through the barometric damper on startup. If so, the amount of time required to reverse the flow (i.e., back to a normal operating mode) was measured.

Part 5 - Fireplace Vent/Pressure Test
The procedure was the same as for Part 2 except that the house depressurization pressures were measured in the same rooms as the woodstoves. This test was performed in the nine units which had woodstoves. When verifying how much pressure was required to backdraft a hot flue, a propane stovetop unit was used to heat the woodstove flue.

2.3 Building Inspections

Prior to the testing, the buildings were inspected in order to prepare intentional openings for the fan depressurization and backdraft testing.

During the building inspection, areas of moisture damage were documented and photographs were taken. In addition, all building exhaust and heating systems were identified and sketched onto building floor plans. The floor plans are included in Appendix A.

3.0 RESULTS

The field work for this project was performed in a ten-day period in early 1986. Attempts were made to perform all tests under appropriate or optimum conditions, however, conditions for some of the field tests were less than ideal. Factors such as wind pressures and gusts had influences on the reliability of some of the field tests. Where appropriate, suspicious data has been noted.

3.1 Fan Depressurization Tests

The leakage through envelopes, characterized using the fan depressurization test, are presented in Table 3.1. The test results are summarized in terms of the air change rates per hour (AC/h) at 50 pascals pressure difference and the Equivalent Leakage Area (ELA).

Houses in the sample ranged from 3.9 to 6.0 AC/h at 50 Pa. However, the ELA is perhaps a better indication of a house's ability to tolerate exhaust fan operation without creating excessive pressure differences. The results, expressed in terms of ELA, indicate the sample of houses ranged from a low of 0.041 m^2 of ELA to a high of 0.088 m^2.

3.2 Backdraft Checks

Several backdraft checks were performed on the houses. These included a measurement of house pressures (from the CMHC Combustion Safety Checklist), a check of whether combustion systems backdrafted with all exhaust fans operating and a measurement of pressures causing cold and warm flue backdraft using the depressurization door fan.

3.2.1 House Pressures

Figure 3.2.1 lists the results of the vent pressure tests detailed in Parts 2 and 5 of CMHC's Combustion Safety Backdraft Checklist. The figure also indicates the individual contribution of each fan to house pressures over and above wind and stack effect. It can be seen that the contribution of the whole-house exhaust fans and range fans were particularly variable.

Table 3.1 AIR-TIGHTNESS TEST RESULTS

House No.	C	n	AC/h @ 50 PA	ELA (m^2)	Correlation
1	17.1	0.801	3.9	0.043	.994
2	22.4	0.811	5.9	0.058	.995
3	21.7	0.740	4.0	0.049	.998
4	27.7	0.798	5.4	0.066	.995
5	22.9	0.787	4.4	0.059	.998
6	43.7	0.679	6.0	0.088	.997
7	15.4	0.811	4.5	0.041	.999
8	18.2	0.831	5.7	0.051	.998
9	17.5	0.795	3.9	0.045	.999
10	19.6	0.812	5.1	0.054	.998
mean		0.787	4.9	0.055	
standard deviation		0.042	0.81	0.013	

3.2.2 Homeowner Check

Table 3.2.2 lists the results of the so-called "homeowner check" (ie: whether the cold flue was backdrafted when all of the exhaust systems were operating).

Interestingly, several houses which exceeded the HDL's did not backdraft. (Houses 1, 3, 6, and 9 fall into this category). Of course, exterior wind and temperature conditions may have increased the ability of flues in these houses to resist backdrafting. This is discussed later in this report. It is noted here because the homeowner check is more sensitive to weather conditions and it may tend to not indicate a problem when house pressures would indicate otherwise.

Table 3.2.2 BACKDRAFT CHECKLIST RESULTS

House No.	Temperature (°C)	Wind (kmh)	Backdraft of Cold Flue Exhaust Systems Operating
1	14	28	no
2	9	55	no
3	3	35	no
4	-7	30	no
5	-7	5	yes
6	-6	13	no
7	-5	12	no
8	-3	12	yes
9	-4	0	no
10	-12	24	no

The higher wind conditions present when testing houses 2, 3 and 4 likely increased the flue draft.

3.2.3 Backdraft Pressures

Because the depressurization fan door was available, there was the opportunity to try to backdraft the combustion devices with the door fan. The house pressure was systematically increased until backdrafting occurred. The backdraft pressure was noted and the results are presented in Table 3.2.3.

Table 3.2.3 PRESSURE REQUIRED TO BACKDRAFT

House No.	Cold Flue (Pa)	Warm Flue (Pa)	Temp (°C)	Wind km/h
1			14	28
2	12	--	9	55
3	30	--	3	40
4	10	17	- 7	30
5	3	*	- 7	5
6	5	15	- 6	13
7	3	8	- 5	12
8	low	7	- 3	12
9	9	14	- 4	0
10	9	*	-12	24

*oil furnace - warm flue not tested

The higher wind conditions present when testing houses 2, 3 and 4 likely increased the flue draft.

The reasons for houses 5 and 8 failing the Backdraft Checklist can be seen in the fact that the combustion devices in both houses backdrafted at very low pressures. The winds were also relatively calm so little contribution was gained from wind induced flue draft.

3.3 Building Inspections

As the final part of the field work, the houses studied were inspected to see if whole-house exhaust (Aston type) fans were really required for moisture control. Some specific construction details appeared to have caused problems in the houses, such as the buildup of mold and mildew, but in general, problems were minimal. Homeowners had been instructed by CMHC not to use their whole-house exhaust fans pending the results of Buchan, Lawton, Parent Ltd's investigation. In view of the fact that only minimal moisture problems were encountered, it can be stated that in general, whole-house ventilation systems did not seem to be required in the houses considered. These findings are important in that switching off the whole-house exhaust fan could have a significant effect on house pressures (see Figure 3.2.1) and their proximity to the HDL.

In one house, number 3, some means of controlling moisture buildup would appear to be appropriate. Moisture problems were quite widespread in this house.

The home heating systems were also examined while in the houses. The heating system inspection revealed problems due to the improper installation of equipment. In houses 7, 8, and 10, the required 46 cm (18") of clearance had not been left between the stovepipes of the woodstoves and the combustible wall material. In house 10, the woodstove was connected to the same flue as the oil furnace. These problems all represent infractions of the building code.

Construction deficiencies also had an effect on the moisture problems which were noted. Poor attic ventilation can be seen to be responsible for much of the water damage to the ceilings in the houses studied. House 6 has no eave venting and house 10 requires additional eave venting. Houses 7 and 8 are storey and a half units, which require some ridge or roof venting in addition to end venting which is already in place. In house 3, because the ceiling is damaged directly beneath the exhaust vent of the Aston fan, it is possible to assume that this duct was, at some point, disconnected from the fan and that the fan exhausted its moist air into the attic.

The moisture inspection revealed high humidity levels within several of the houses. While the moist eastern climate is a factor behind these high humidities, in several cases, the activities of house occupants contributed significantly to the excess moisture. Clothes dryers were often vented indoors and firewood was often dried in the basement area. A summary of inspection findings is presented in Table 3.3.

While the house occupants were aware that the exhaust fan operation will help control moisture in the house, the venting of indoor moisture can only be effective if outdoor absolute humidities are lower than indoor absolute humidities. Venting to reduce moisture levels should be done when the outside air is relatively cold or dry. Few attempts appeared to have been made to confine fan operation to dry days.

Conversations with occupants indicated that several of the occupants had little understanding of the operation of the dehumidistats which control the exhaust fans. Also, in many cases, occupants did not want to operate the fans because the basement exhaust vent was located directly above their woodstove. The occupants were concerned that heated air was being directed outside before it could be utilized for space heating purposes.

Table 3.3 MOISTURE INSPECTION RESULTS

House No.	Clothes Dryer Vented Indoors	Firewood Stored Indoors	Locations of Mildew	Other Comments
1			- 1st floor windows - around attic hatch - corner of bedrm 2 ceiling & floor	
2	x		- corner of bedrm 1 at ceiling	
3	x	x	- 1st floor windows - corner of bedrm 1, bedrm 2 & living room at ceiling & floor	- kitchen ceiling damaged by water; attic insulation is wet at this location
4			- 1st floor windows - corner of bedrm 2 at ceiling	- wood sill of living room window stained by water
5				
6		x		- roof plywood is wet - large puddles of wate on basement floor - water damage to ceil in bedrm 1 & living
7			- corner of bedrm 2 at floor level	- roof plywood is damp
8			- on utility rm wall behind well water tank	- roof plywood is damp
9		x		- light frost building up on roof plywood
10		x	- 1st floor windows - corner of bedrm 1 at floor - closet wall of bedrm 1	- water damage on bathroom ceiling

4.0 DISCUSSION OF RESULTS

The information provided by the field testing of the ten houses in this study allows several significant observations to be made.

4.1 Characteristics of the Houses

Firstly, it did not appear that any exceptional measures had been taken to air-tighten these houses. Of the houses tested, the most air-tight (in terms of ELA) had an ELA of 0.041 m^2. Therefore the houses had a significant ability for the house envelope to provide make-up air when exhaust fans were operating such that excessive pressures would not be created across the building envelope.

Early versions of the Combustion Safety Backdraft Checklist, produced by CMHC, suggested that very low pressures were tolerable across the building envelope. Under those versions, more than half of the houses in this study would have failed. These house depressurization limits (HDL's) have since been revised to less conservative (more realistic) allowable house pressures.

For the houses in this study, the appropriate house depressurization limits are indicated in Table 4.1. CMHC's house depressurization limits, however, specify limits for air-tight woodstoves and for fireplaces only. In most of the houses in this study the limiting combustion device was a non-air-tight woodstove, so the house depressurization limit cited in Table 4.1 is the limit of 5 Pa currently being used in CSA Draft Standard F326 - Requirements for Residential Ventilation.

If the flow coefficients from the fan depressurization tests are used, it is possible to calculate a theoretic exhaust which will cause the house depressurization limit pressure to be exceeded. This value has been included in Table 4.1 and listed as the "Theoretical Exhaust Limit". It can be seen from the table that the theoretical exhaust limits appropriate for houses in this study range from 57 L/s to 134 L/s of exhaust flow.

Table 4.1 HOUSE DEPRESSURIZATION LIMITS FOR THE HOUSES IN THIS STUDY

House No.	Limiting Combustion Device	House Depressurization Limit (Pa)	Theoretical Exhaust Limit* (L/s)
1	Woodstove	5	63
2	Woodstove	5	83
3	Woodstove	5	71
4	Woodstove	5	100
5	Oil Furnace	4	68
6	Woodstove	5	134
7	Woodstove	5	57
8	Woodstove	5	69
9	Woodstove	5	63
10	Oil Furnace	4	60

* calculated using the flow equation $Q = C \quad P^n$

where Q = flow in L/s

C = } coefficients determined for the fan depressurization test
N = }

P = pressure difference from HDL's (House Depressurization Limits)

4.2 Characteristics of the Exhaust Devices in the Houses

Section 3.2 indicated the pressures created by operating each of the various exhaust devices in the houses. Again, if the flow coefficients from the fan depressurization test are used, it is possible to calculate the approximate exhaust flows which cause these pressure differentials. It should be noted, however, that these calculated flows are only approximations, and are prone to considerable error because the accuracy of the pressure measurements was of the same order of magnitude as the actual measurement. Caution must be used in interpreting these results.

It can be seen from the calculated flows, however, that none of the devices which were operated alone would exceed the theoretical exhaust limit (Table 4.2) for any of the houses. At the outset of the project it was speculated that significant exhaust flows could be generated by the whole-house ventilation system. A significant finding from the field test results is that flows generated by the whole-house exhaust fan were of the same order of magnitude as those generated by a range hood, for example.

Considerable variability was found in the results, however it is likely that the resistance created by exhaust ducting on the whole-house ventilation fan limited exhaust air flows to values of well below those quoted in the manufacturer's literature.

It must be stated that there is something unique about the control strategy for the whole-house exhaust fan systems operating in these houses. The system is triggered by a humidistat controller and therefore will be operated at times of high humidities (eg., while cooking, after showers). There is a likelihood that other exhaust fans in the bathroom and kitchen will be operated at the same time. Therefore, if the operation of the whole-house exhaust system and a range hood or bathroom fan are considered for example, a worst case scenario for house pressures can be developed.

In houses 1, 3 and 5 the operation of the Aston fan and the range hood will cause exhaust flows to be relatively close to the theoretical exhaust limit beyond which backdrafting is a possibility. The operation of both the whole-house exhaust fan and the range hood at the same time in these houses would be of concern because the operation of these fans in combination with small house pressures would cause the house pressures to exceed the HDL's.

Table 4.2 FLOWS THROUGH EXHAUST FANS LOCATED IN THE HOUSES STUDIED

House No.	Calculated Exhaust Flows* (L/s)				
	Wind & Stack Effect	Whole House Exhaust	Range Fan	Dryer	Bathroom Fan
1	36	17	40	18	17
2	39	23	7		7
3	29	31	21		5
4	16	12	11		0
5	47	21	44		12
6	94	11	20	19	18
7	21	11	0	10	5
8	45	12	12	11	16
9	18		12	23	10
10	34		14		13
Average	37	17	19	16	10

* Calculated from the measured stack effect/wind pressures, the house pressures (Figure 3.2.1) and flow coefficients determined from the fan depressurization test.

There is also the likelihood that the whole-house exhaust fan, operated in combination with a clothes dryer, could create significant exhaust pressures in house 1. In view of the fact that the clothes dryer is vented to the exterior of the building, however, the likelihood of both the whole-house exhaust fan and the dryer being on at the same time, a time when the woodstove is vulnerable to backdrafts, is quite low.

4.3 Requirements for Exhaust Fans -Alternatives for Controlling Backdraft

It should also be restated that an inspection of the houses in this study indicated that, for the most part, the whole-house exhaust fans were not necessary. Significant control of moisture could be obtained through other measures such as venting dryers outdoors and drying wood outdoors. Thus, one alternative for controlling house pressures is to disconnect the whole-house exhaust fans entirely. It should be recognized though, that home occupants may be dissatisfied with this alternative; house 3 particularly appears to require some means of moisture control (ie., significant use of the whole-house fan).

Another alternative may be to simply label both the whole-house exhaust and the range fan with a warning that states that operation of the whole-house exhaust fan in combination with the range hood in houses 1, 3 and 5 may adversely effect the operation of the woodstove and/or furnace. This may be sufficient for a well-informed home occupant.

A third alternative is to put a make-up air inlet in the building such that excessive house pressures will not be developed.

A final alternative might be to place a switch or a relay in the range fan and whole-house exhaust fan circuits to ensure that these devices cannot be operated simultaneously. This would preclude the possibility of homeowner error in operating these devices.

It is recommended that homeowners be furnished with information on the pros and cons of each alternative and an appropriate choice be made in consultation with the local CMHC Branch.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The general conclusion from the field measurements is that the whole-house exhaust fan did not produce flows which were significantly different than those produced by conventional rangehood fans and dryers. The whole-house exhaust fans were limited in flow by the resistance provided by an extensive network of ducts.

There is a likely scenario in which fans used to control humidity (eg., kitchen and bathroom fans) would operate simultaneously with those triggered by a humidistat (eg., whole-house exhaust fans). Comparing the theoretical exhaust limits for each of the houses to exhaust flows when the whole-house exhaust and range fans were operated simultaneously, it was found that this scenario could cause excessive depressurization in houses 1, 3 and 5. Some remedial measures would be appropriate for these houses. House 3 appeared to require the operation of the whole-house fan for moisture control. Remedial measures appropriate for this house should anticipate significant use of the whole-house fan for moisture control, (ie., the whole house fan should not be disconnected).

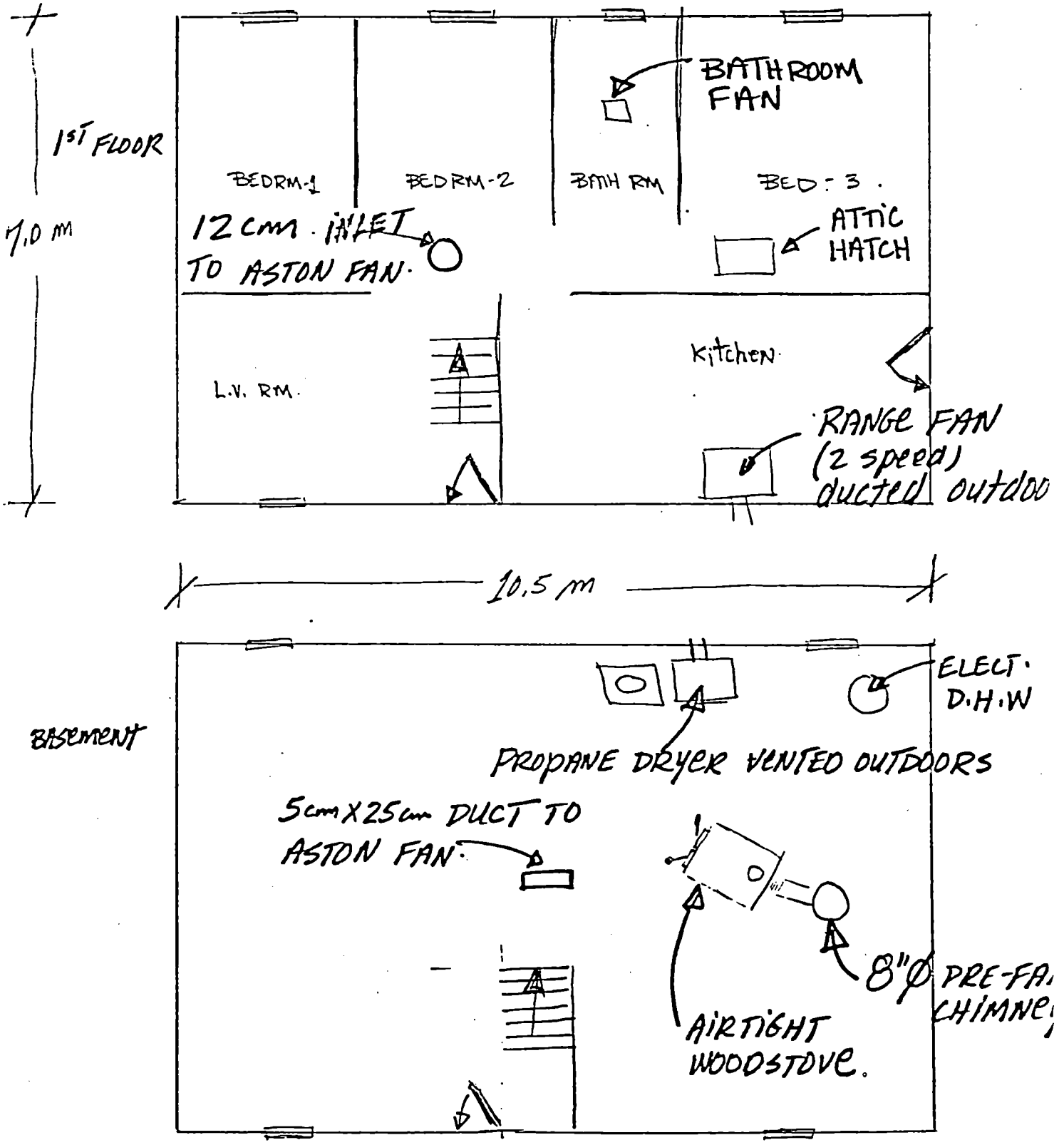
The possible alternatives include labelling the whole-house exhaust and range fans with a warning of the problem, placing a make-up air inlet in the house to allow additional air leakage when needed, placing an interlock in the wiring between the range fan and the whole-house exhaust fan such that neither device can be operated simultaneously, or disconnecting the whole-house exhaust fan entirely.

In view of the fact that, for the most part moisture problems were minimal, and given that other recommendations such as venting the dryer to the exterior of the building and drying wood outdoors are possible, the use of the whole-house exhaust fans in most of the houses considered may not be required.

APPENDIX A

HOUSE 1.

— ASTON FAN INSTALLED IN ATTIC.



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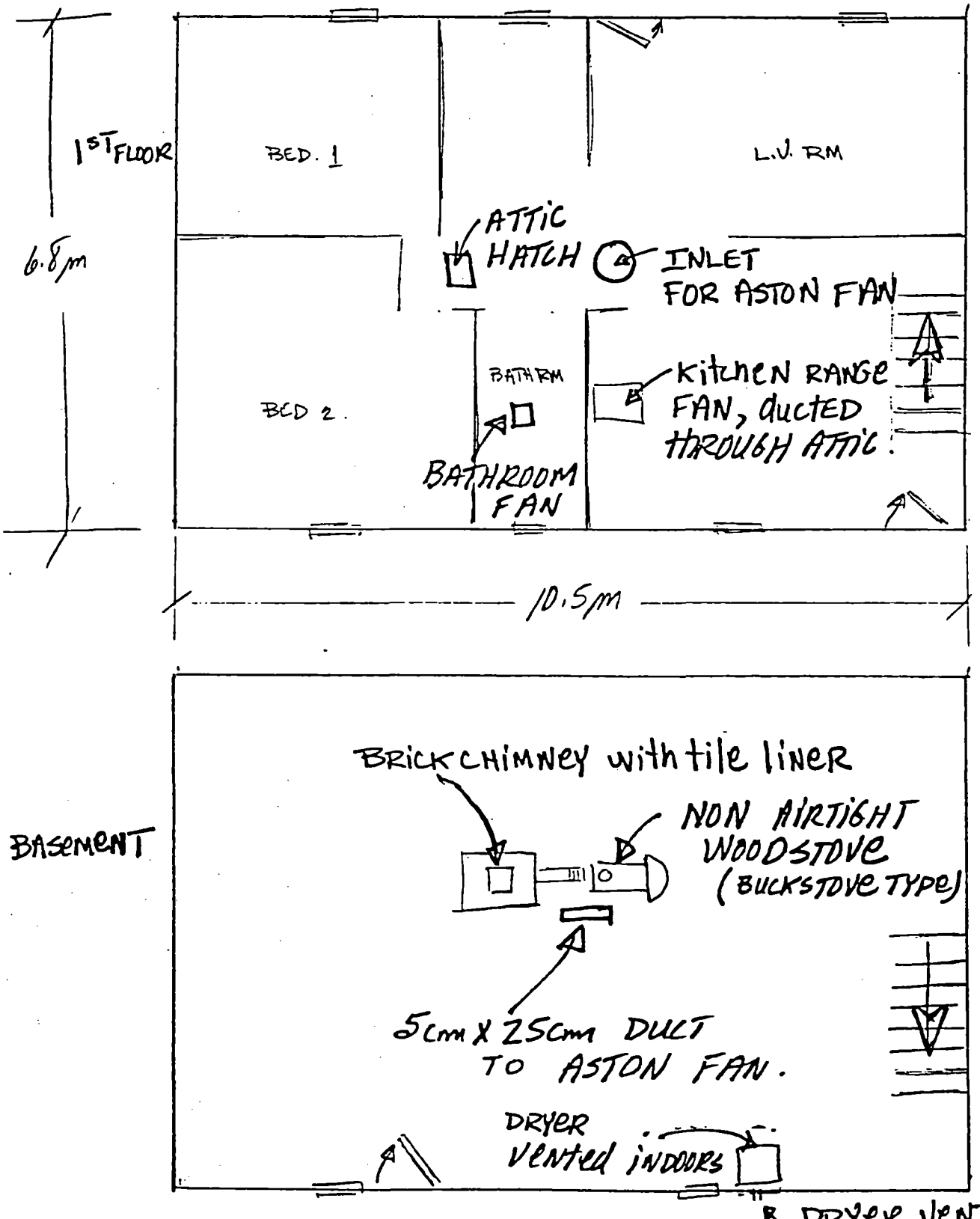
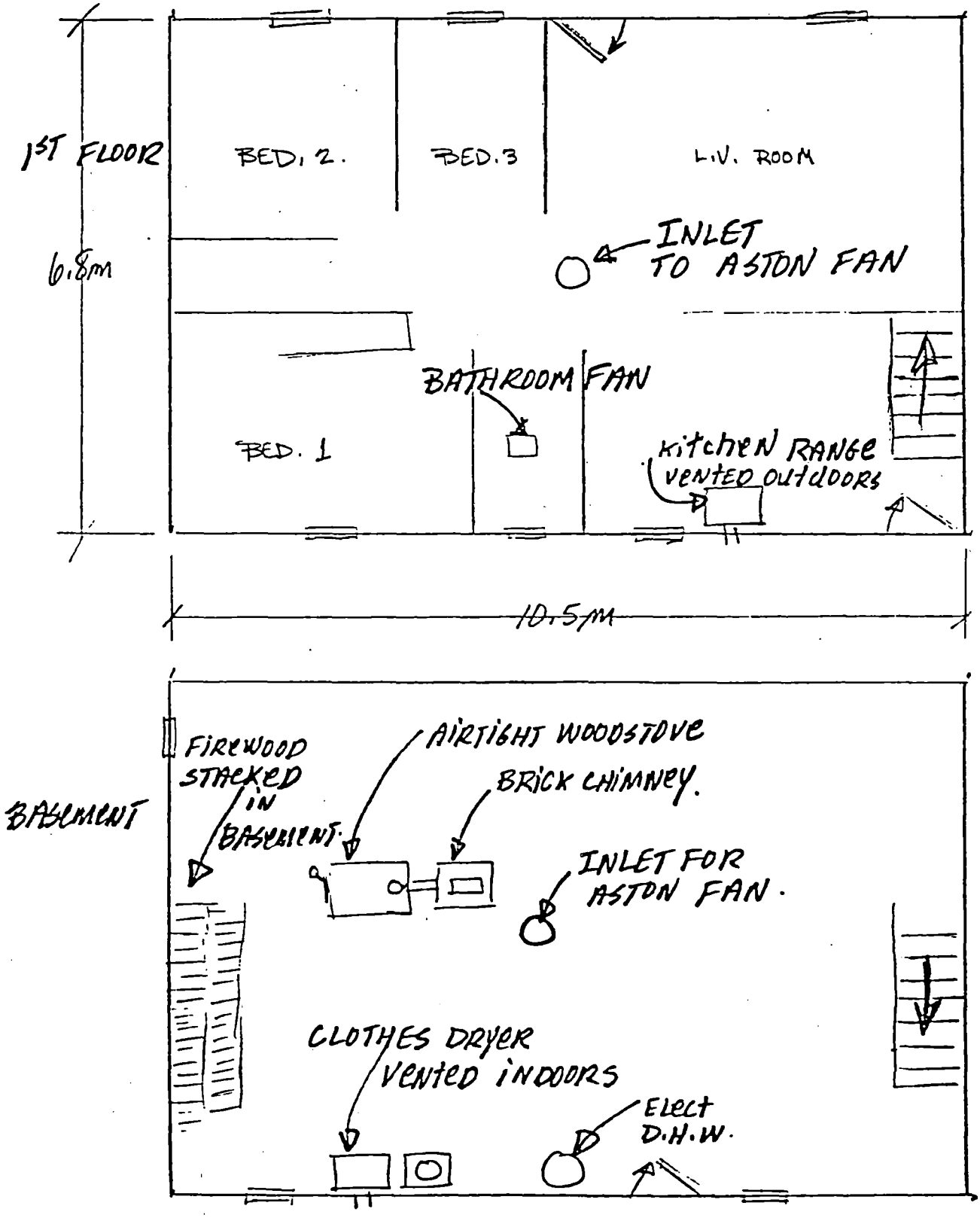


R DRYER VENT BLOCK

HOUSE 3

— ASTON FAN INSTALLED IN ATTIC.



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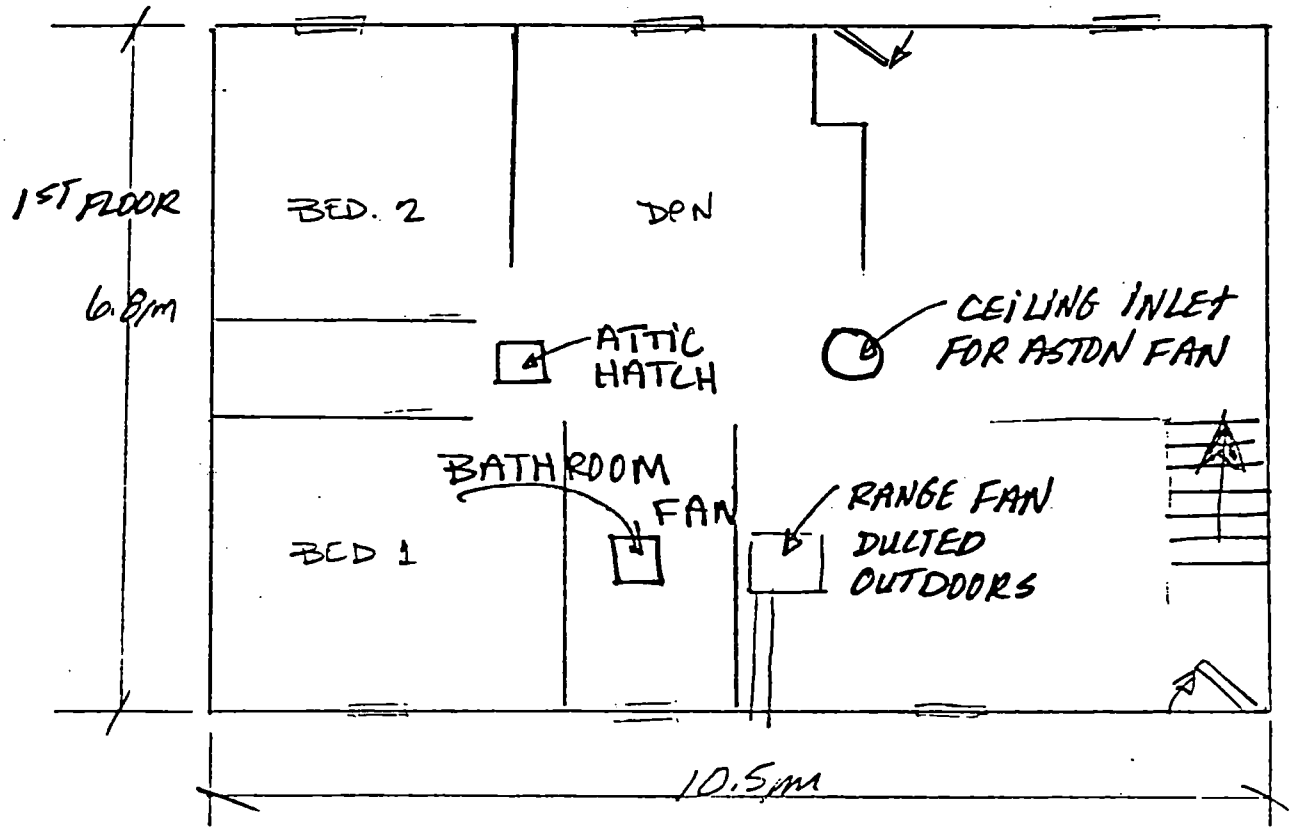

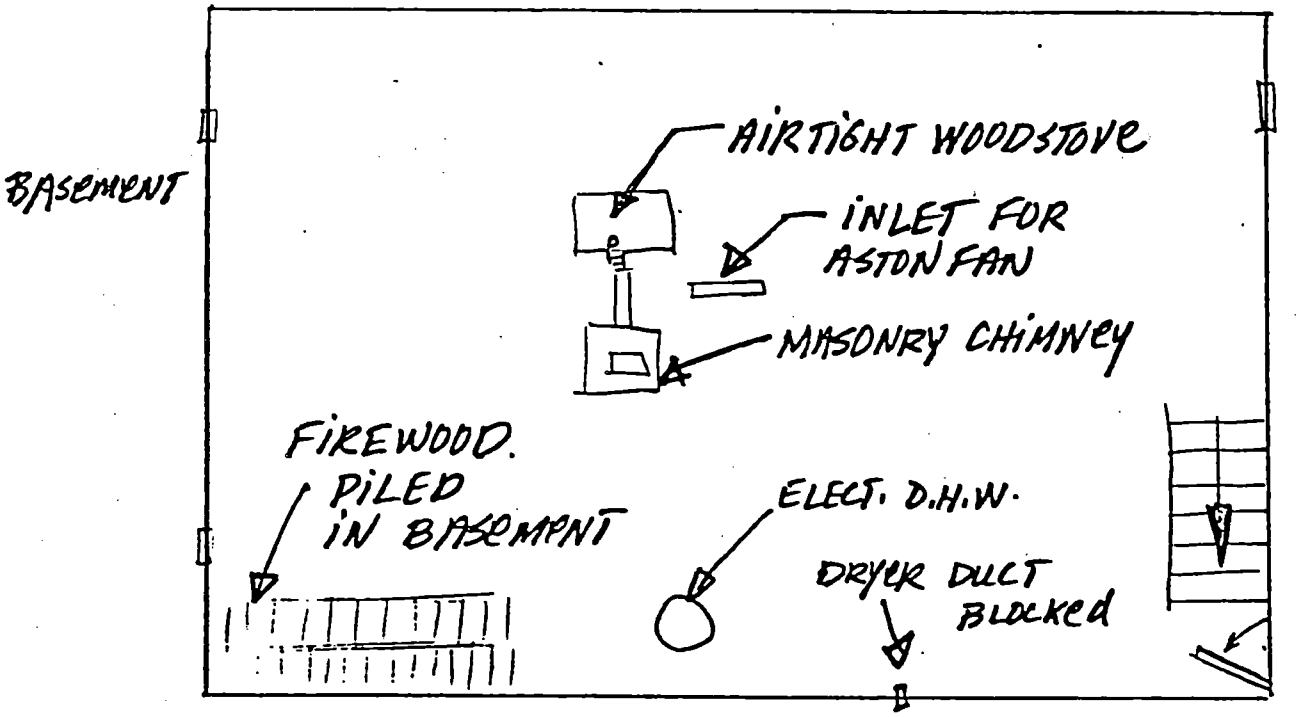

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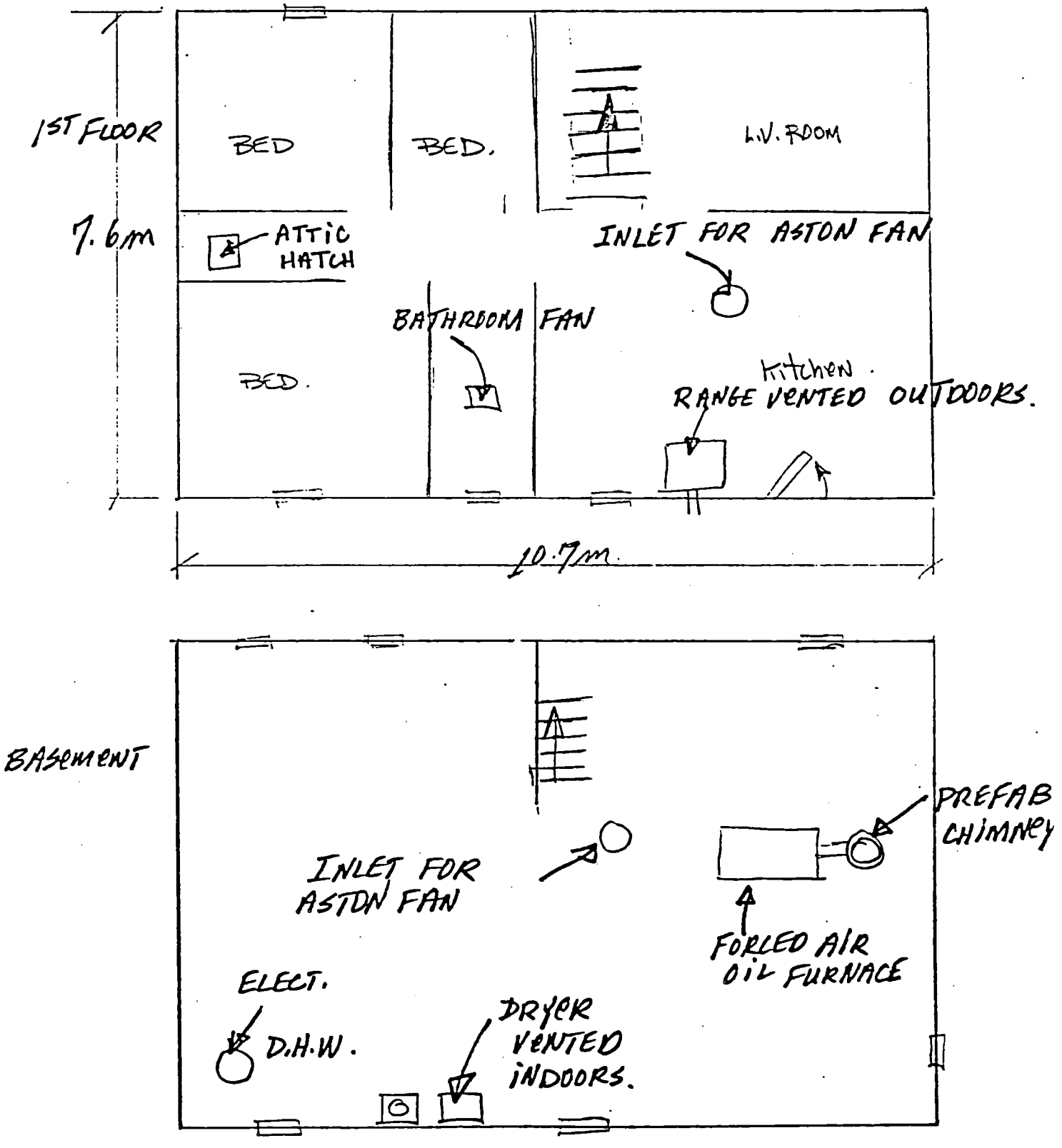

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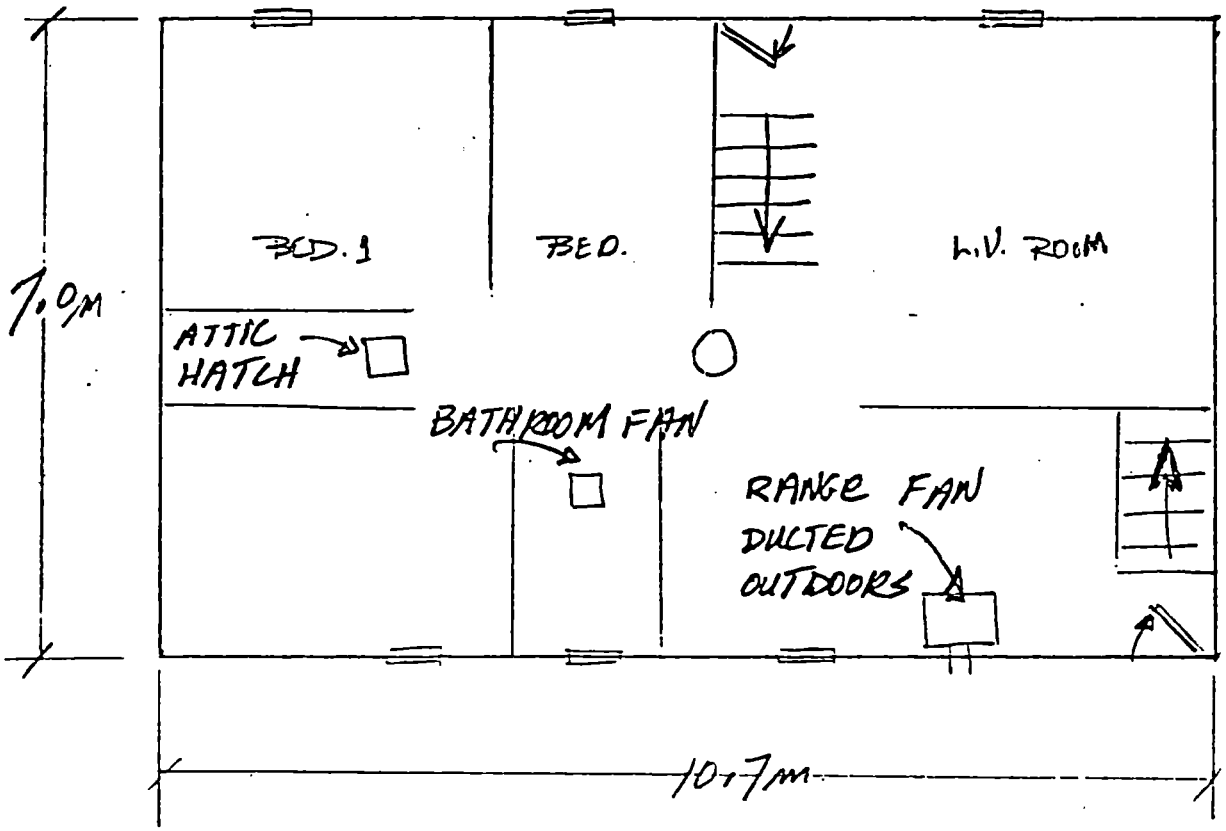
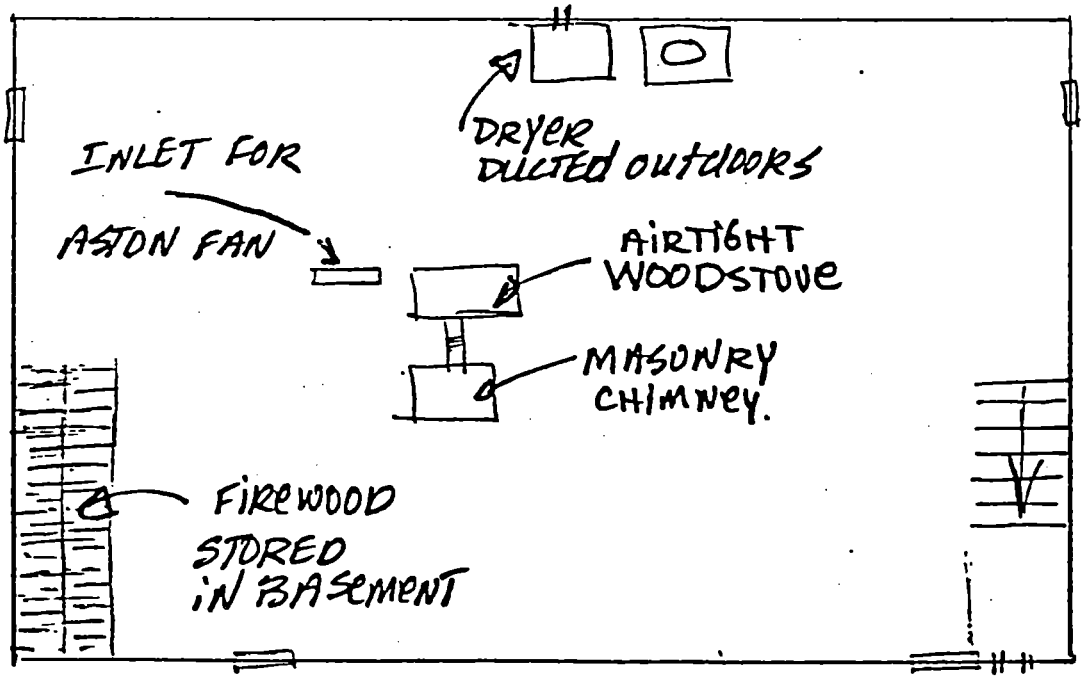
— ASTON FAN INSTALLED IN ATTIC.

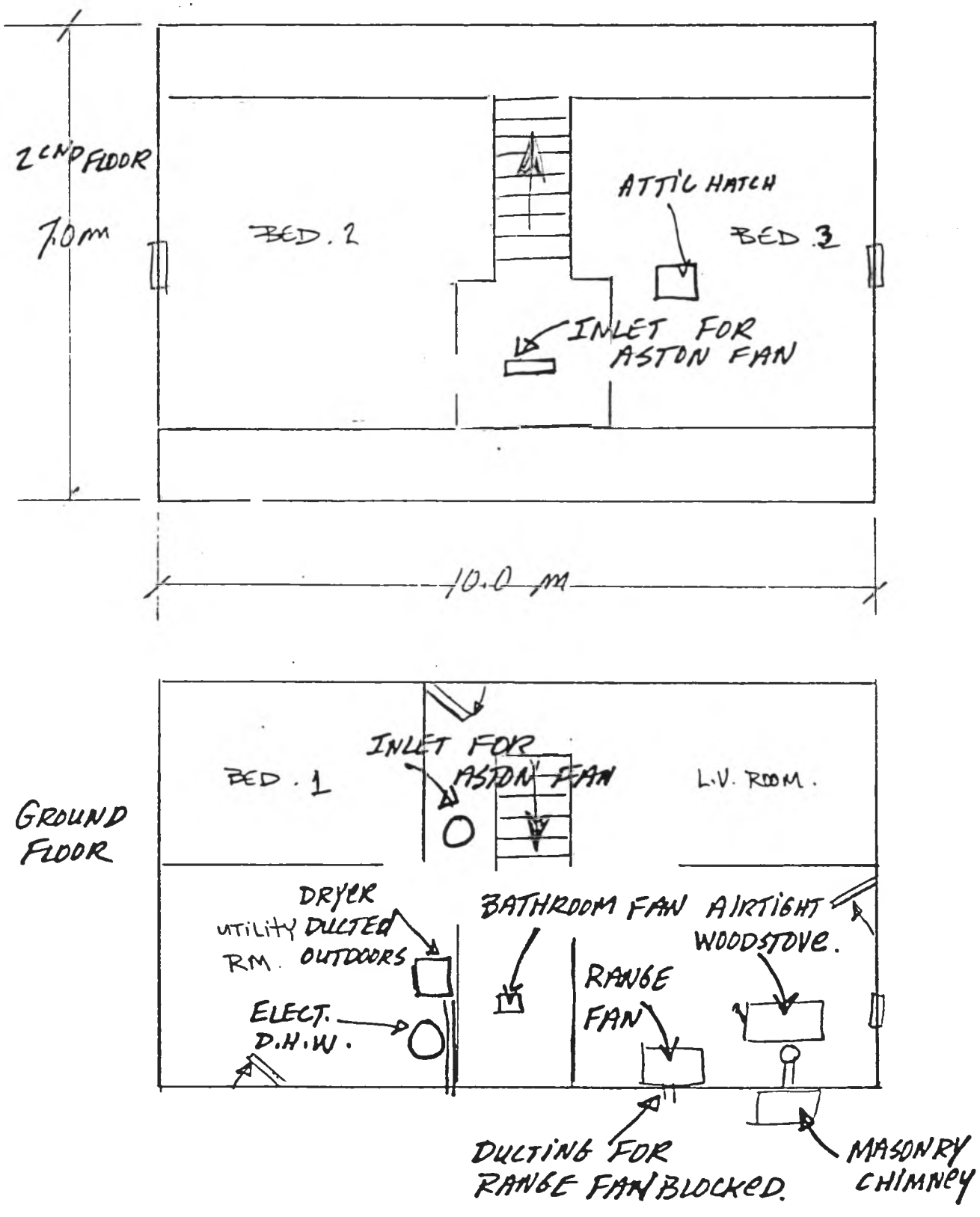




TWO AIR INL
TO COOL STORA

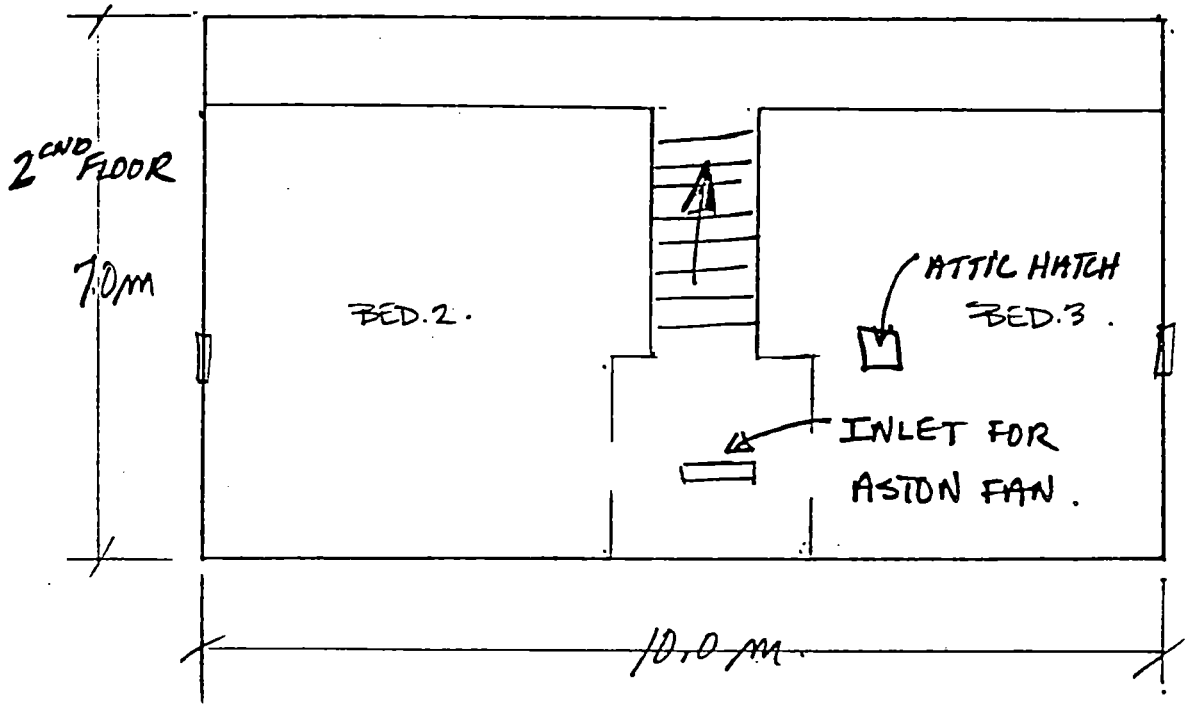
HOUSE 7

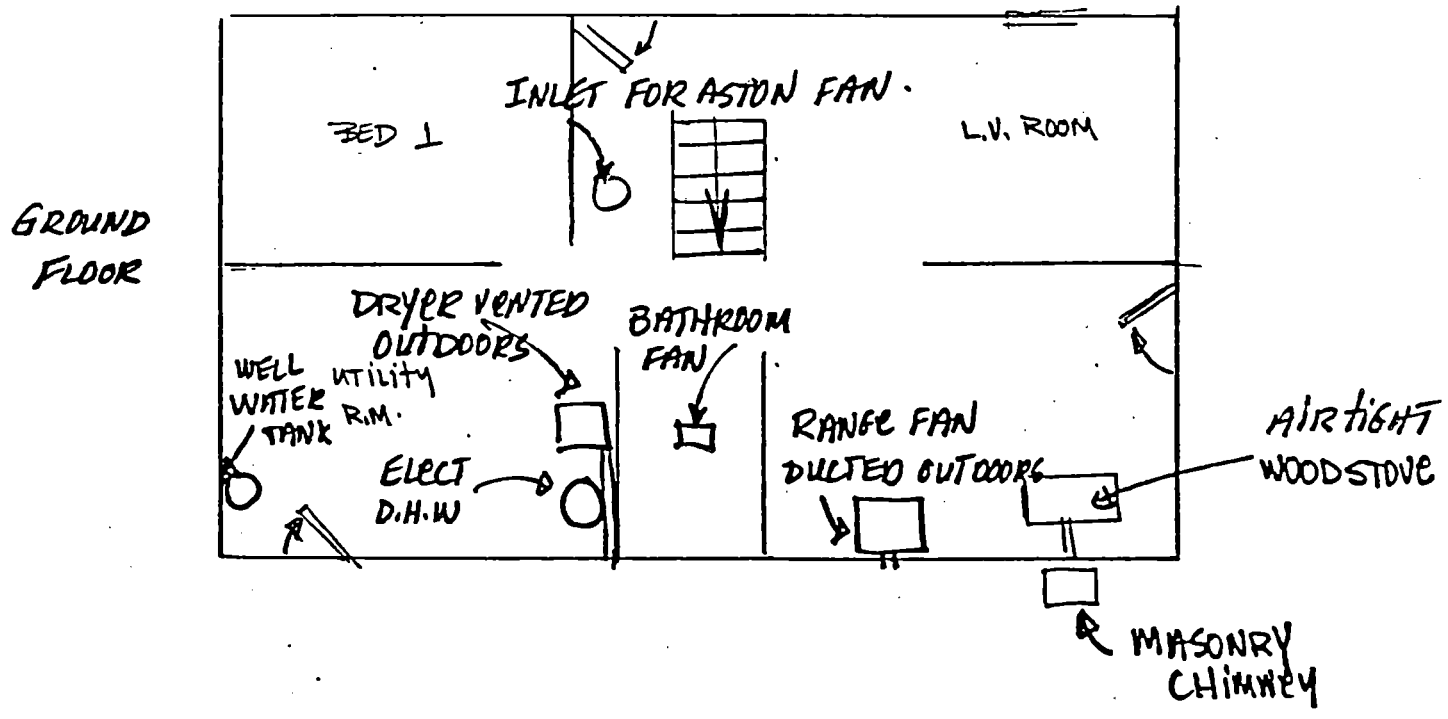
— ASTON FAN INSTALLED IN ATTIC.



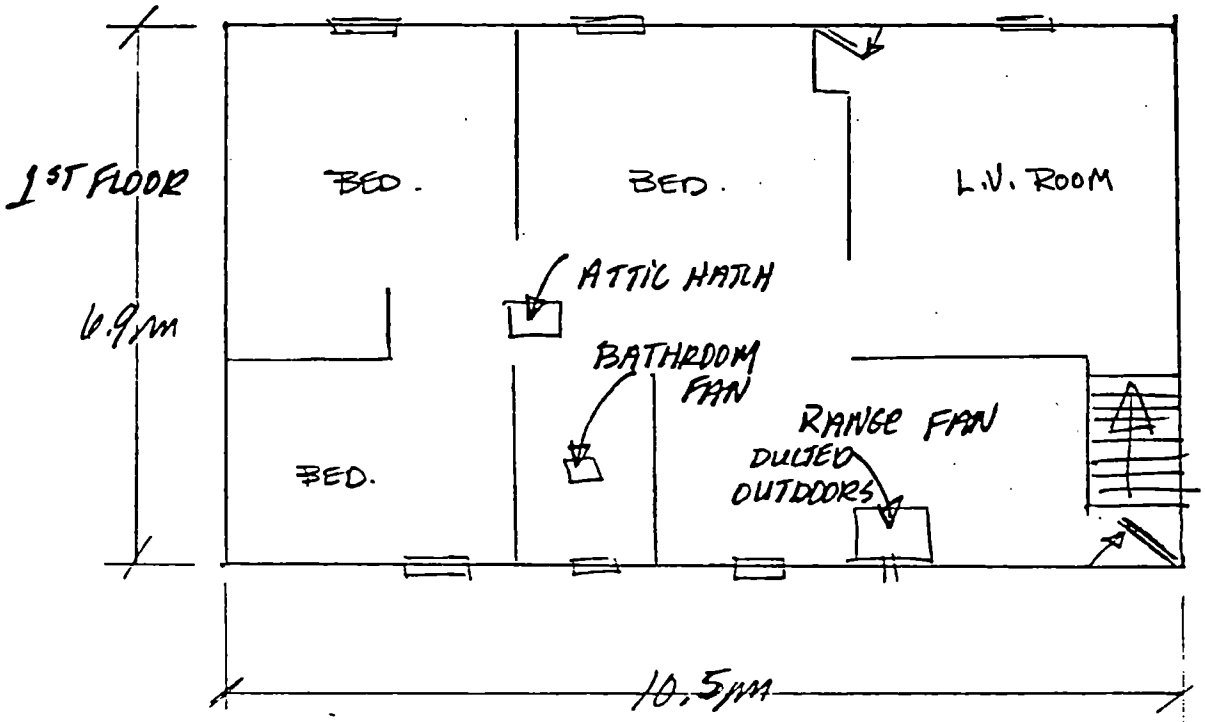
HOUSE 8

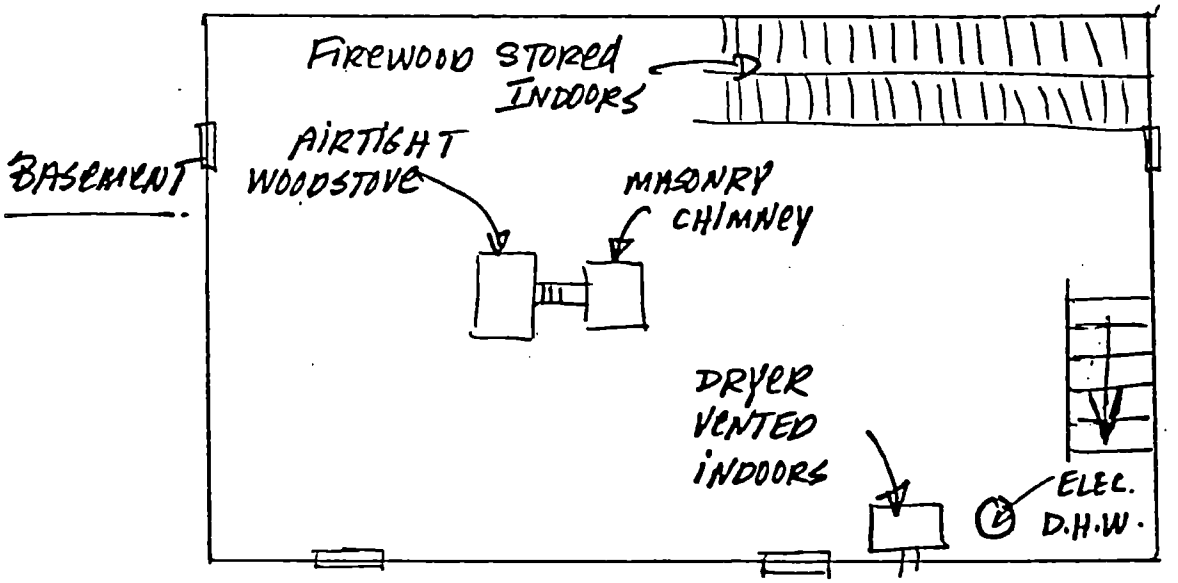
— ASTON FAN INSTALLED IN ATTIC.



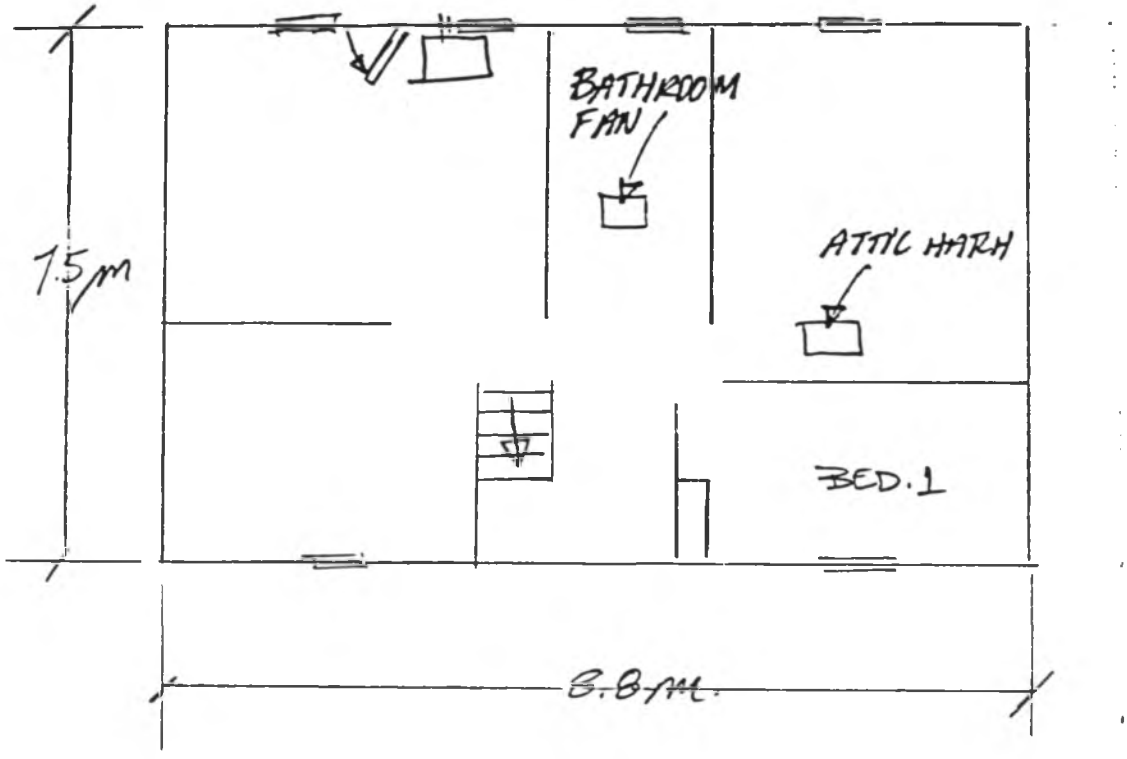


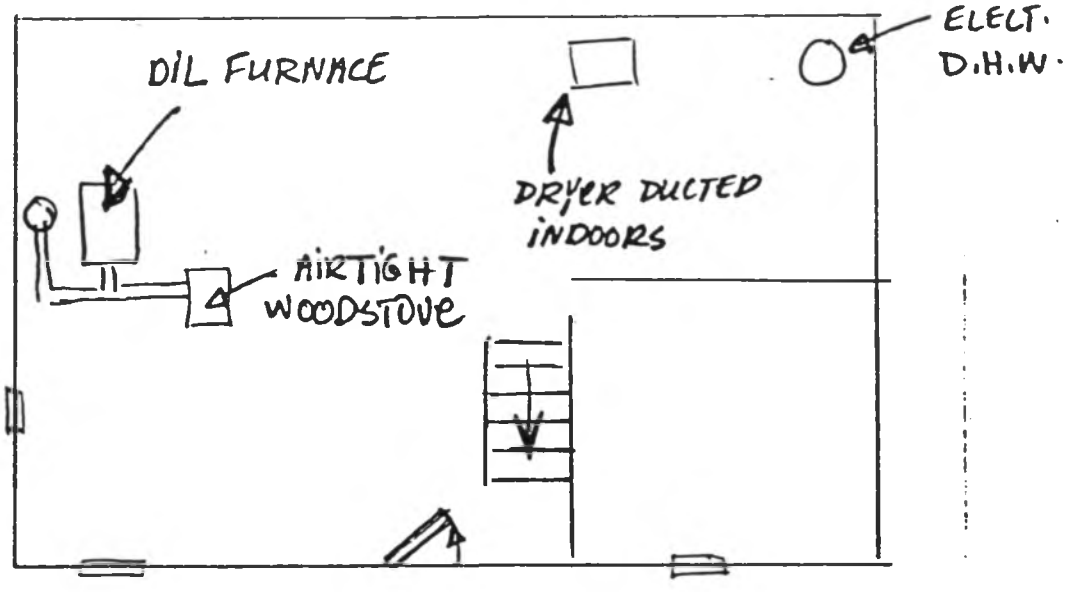
HOUSE 9


1ST FLOOR
6.9m
BED.
BED.
L.V. ROOM
ATTIC HATCH
BATHROOM FAN
RANGE FAN
DUCTED OUTDOORS
BED.
10.5m


BASEMENT
FIREWOOD STORED INDOORS
AIRTIGHT WOODSTOVE
MASONRY CHIMNEY
DRYER VENTED INDOORS
ELEC. D.H.W.

HOUSE 10


BATHROOM FAN
ATTIC HATCH
BED. 1
7.5m
8.8m.


ELECT. D.H.W.
OIL FURNACE
DRYER DUCTED INDOORS
AIRTIGHT WOODSTOVE

APPENDIX B

```
*  *  *  *  *  *  *  *
   ENERCARE
   AIR LEAKAGE TEST
*  *  *  *  *  *  *  *
CMHC 2277
R TURNER
JAN 27/86
TEST NO. 1
BAROMETRIC 100.
OUTDOOR TEMP 14.(C)
WIND SPEED 28(KPH)
VOLUME:   367.M3
*  *  *  *  *  *  *  *
PA DATA TPIN FLOW ERR
   (12) (C)  L/S    %

 18   16   21  179
                      3
 23   19   21  196
                     -7
 33   41   21  293
                      3
 43   56   21  345
                     -0
 53   81   21  418
                      1
 63  100   21  467
                     -1
*  *  *  *  *  *  *  *
EXPONENT (N)=   0.801
CONSTANT (C)=  17.100
CORRELATION =  99.447
STND. ERROR =   4.707
*  *  *  *  *  *  *  *
EQUIVALENT LEAKAGE AREA:
    ELA  M2 =   0.043
    ELA FT2 =   0.469

FORCED AIR CHANGE/HOUR:
 ACH @50 PA =   3.860
*  *  *  *  *  *  *  *
```

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name of ~~Builder~~ OWNER: MR & MRS. RALPH TURNER

Address of ~~Builder~~: _____ Phone No. 1-902-662-20

Address of Building: DEBERT, Colchester Co, N.S.

Name of Test Technician: GARY O'CONNOR

Name of Testing Firm*: Buchan, Lawton, Parent Ltd.

Address of Testing Firm: 5370 Canotek Road, Ottawa, Ontario K1J 8X7 Phone No. (613) 748-3762

Date of Test: JAN. 27/86 Time of Test: 12:00 NOON

Date of Report: _____ _____ (Signature - Technician)*

WEATHER DATA TRURO - WEATHER OFFICE 902 893-2229
BIBLE HILL

Outdoor Temperature +14 °C Barometric Pressure 100.04 kP

Wind Speed 28 Km/h Wind Direction _____

nd Variability GUSTS TO 55 km/h. (RAIN)

EQUIPMENT USED

Manufacturer: Retrotec

Type: Model 501 Serial No. 141

Flow Measuring Technique: Nozzle X Fan Speed _____ Orifice _____

Calibration Range of Flow Measuring Device _____ L/s to _____ L/s

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote _____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No _____

BUILDING UNDER TEST

Floor area (including basement) 2 x (7.0 x 10.5) = 147 m^2 Volume 367.5
(From HOTCAN Data She

Type of House (Bungalow, tri-level, two storey, etc.) with SPLIT LEVEL EN

Special Features (Cathedral ceiling, crawlspaces, etc.) HAS ATTIC SPACE
BASEMENT INSULATED. WITH ASTON FAN IN ATTIC.

---

* Firms must be listed with HUDAC in order to perform this test

```
* * * * * * * *
   ENERCARE
   AIR LEAKAGE TEST
* * * * * * * *
CMHC 2277
R SHERRARD
JAN 28/86
TEST NO. BACKDRA
BAROMETRIC 98.5
OUTDOOR TEMP 9.(C)
WIND SPEED 55(KPH)
VOLUME:   327.M3
* * * * * * * *
PA DATA TRIN FLOW ERR
   (12) (C)  L/S    %

 14   20   22  199
                    4
 17   22   21  210
                   -6
 21   32   21  255
                   -3
 27   56   21  342
                    5
 39   88   21  432
                   -0
 47  122   21  513
                    0
 56  155   21  581
                   -0
* * * * * * * *
EXPONENT (N)=   0.811
CONSTANT (C)=  22.390
CORRELATION =  99.550
STND. ERROR =   4.562
* * * * * * * *
EQUIVALENT LEAKAGE AREA:
    ELA  M2 =   0.058
    ELA FT2 =   0.629

FORCED AIR CHANGE/HOUR:
 ACH @50 PA =   5.886
* * * * * * * *
```

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name of Builder: MR & MRS. RICHARD SHERRARD.

Address of Builder: FALMOUTH, HANTS CO, N.S. Phone No. 1-902-798-550[illegible]

Address of Building: _____

Name of Test Technician: GARY O'CONNOR.

Name of Testing Firm*: Buchan, Lawton, Parent Ltd.

Address of Testing Firm: 5370 Canotek Road, Ottawa, Ontario K1J 8X7 Phone No. (613) 748-3762

Date of Test: JAN 28/86 Time of Test: 1:00 P.M.

Date of Report: _____ _____ (Signature - Technician)*

WEATHER DATA (CFB GREENWOOD; FAR. ENOUGH) DATA FROM CFB GREENWOOD 902-765-339[illegible]

Outdoor Temperature: 9°C °C Barometric Pressure: 985.2 kPa

Wind Speed: 50-61 Km/h Wind Direction: _____

Wind Variability: _____ 32 KNOTS GUSTING TO 42 KNOTS.

EQUIPMENT USED

Manufacturer: Retrotec

Type: Model 501 Serial No. 141

Flow Measuring Technique: Nozzle X Fan Speed _____ Orifice _____

Calibration Range of Flow Measuring Device: _____ L/s to _____ L/s

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote _____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No _____

BUILDING UNDER TEST

Floor area (including basement): 2X(10.33X6.33) = 130.8 m^2

Volume: (10.33X6.33X5.0) m^3 = 327. m^3 (From HOTCAN Data Sheet)

Type of House (Bungalow, tri-level, two storey, etc.) _____

Special Features (Cathedral ceiling, crawlspaces, etc.) → HAS ASTO[illegible] CENTRAL VENTILATION TYPE FAN.

* Firms must be listed with HUDAC in order to perform this test

```
* * * * * * * *
  ENERCARE
  AIR LEAKAGE TEST
* * * * * * * *
CMHC 2277
M COC-RANE
JAN 29/86
TEST NO. BACKDRA
BAROMETRIC 99.4
OUTDOOR TEMP 3.(C)
WIND SPEED 22(KPH) KNOTS
VOLUME:   357.M3
* * * * * * * *
PA DATA TPIN FLOW ERR
   (12) (C)  L/S    %

 17   17   20  179
                   1
 22   23   19  210
                  -2
 32   40   19  280
                  -1
 42   64   19  358
                   3
 52   83   19  410
                   1
 62  100   19  452
                  -2
* * * * * * * *
EXPONENT (N)=   0.740
CONSTANT (C)=  21.762
CORRELATION =  99.827
STND. ERROR =   2.475
* * * * * * * *
EQUIVALENT LEAKAGE AREA:
    ELA M2 =   0.049
    ELA FT2 =   0.528

FORCED AIR CHANGE/HOUR:
 ACH @50 PA =   3.980
* * * * * * * *
```

4.3

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name ~~of Builder~~ MR & MRS MARTIN COCHRANE

Address ~~of Builder~~ _____ Phone No. 902-757-2645

Address of Building NEWPORT, HANTS CO, NOVA SCOTIA. (MOTH

Name of Test Technician GARY O'CONNOR

Name of Testing Firm* Buchan, Lawton, Parent Ltd.

Address of Testing Firm 5370 Canotek Road
Ottawa, Ontario K1J 8X7 Phone No. (613) 748-3762

Date of Test JAN 28/86 Time of Test 6:00 p.m.

Date of Report _____ _____
(Signature - Technician)*

WEATHER DATA DATA FROM CFB GREENWOOD. 902-765-3391

Outdoor Temperature +3 °C Barometric Pressure 99.4 kPa

Wind Speed ~~41 K.P.H~~ 22 (?) ~~km/h~~ KNOTS Wind Direction FROM 220° S.W.

Wind Variability GUSTS TO 32 KNOTS

EQUIPMENT USED

Manufacturer Retrotec

Type Model 501 Serial No. 141

Flow Measuring Technique Nozzle X Fan Speed _____ Orifice _____

Calibration Range of Flow Measuring Device _____ L/s to _____ L/s

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote _____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No _____

BUILDING UNDER TEST

Floor area (including basement) (2 X 10.45 X 6.84) m^2 = 143 m^2

Volume 10.45 X 6.84 X 5.0 = 357.4 m^3 (From HOTCAN Data Sheet)

Type of House (Bungalow, tri-level, two storey, etc.); _____

Special Features (Cathedral ceiling, crawlspaces, etc.) HAS ASTON. CENTRAL VENTILATION FAN

* Firms must be listed with HUDAC in order to perform this test

```
*  *  *  *  *  *  *  *
   ENERCARE
   AIR LEAKAGE TEST
*  *  *  *  *  *  *  *
CMHC 2227
J MCCARTHY
JAN 29/86
TEST NO. RACKDPA
BAROMETRIC 100.8
OUTDOOR TEMP -7.(C)
WIND SPEED 30(KPH)
VOLUME:   360.M3
*  *  *  *  *  *  *  *
PA DATA TPIN FLOW ERR
   (12) (C)  L/S    %

 13   19   17  182
                   -6
 18   38   17  262
                    5
 28   68   17  355
                    2
 38  105   17  445
                    1
 48  137   17  511
                   -1
 58  180   17  590
                   -2
*  *  *  *  *  *  *  *
EXPONENT (N)=   0.758
CONSTANT (C)=  27.725
CORRELATION =  99.571
STND. ERROR =   4.662
*  *  *  *  *  *  *  *
EQUIVALENT LEAKAGE AREA:
   ELA  M2 =   0.066
   ELA FT2 =   0.718

FORCED AIR CHANGE/HOUR:
 ACH @50 PA =   5.385
*  *  *  *  *  *  *  *
```

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name ~~of Builder~~ Ms Julie McCarthy

Address of Builder _____ Phone No. 902-798-47

Address of Building FALMOUTH, HANTS CO., NOVA SCOTIA

Name of Test Technician GARY O'CONNOR

Name of Testing Firm* Buchan, Lawton, Parent Ltd.

Address of Testing Firm 5370 Canotek Road
Ottawa, Ontario K1J 8X7 Phone No. (613) 748-3762

Date of Test JAN. 29/86 Time of Test 9:30 A.m.

Date of Report _____ _____
(Signature - Technician)*

(*@ HOUSE WIND IS CALM) WEATHER DATA FROM C.F.B. GREENWOOD
DATA FOR 9:00 A.m) 902-765-3391

Outdoor Temperature -7 °C Barometric Pressure 100.8 kPa

Wind Speed 28-32 Km/h (15 KNOTS) Wind Direction from 280°

Wind Variability _____ (50 KM SOUTH WEST OF FALMOUTH OF 101)

EQUIPMENT USED

Manufacturer Retrotec

Type Model 501 Serial No. 141

Flow Measuring Technique Nozzle X Fan Speed ✓ Orifice _____

Calibration Range of Flow Measuring Device _____ L/s to _____ L/s

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote _____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No _____

(2X 6.81X10.47 m²) BUILDING UNDER TEST (6.81X10.47)(5.0) m³

Floor area (including basement) 144 m² Volume 360 m³
(From HOTCAN Data Sheet

Type of House (Bungalow, tri-level, two storey, etc.) _____

Special Features (Cathedral ceiling, crawlspaces, etc.) HAS ASTON.
CENTRAL VENTILATION FAN

* Firms must be listed with HUDAC in order to perform this test

```
* * * * * * * *
   ENERCARE
   AIR LEAKAGE TEST
* * * * * * * *
CMHC 2227
S MCDONALD
JAN 29/86
TEST NO. BACDPAF
BAROMETRIC 100.8
OUTDOOR TEMP -7.(C)
WIND SPEED LIGHT(KPH)
VOLUME:   407.M3
* * * * * * * *
PA DATA TPIN FLOW ERR
   (12) (C)  L/S    %

 12   14   17  155
                   -4
 17   27   17  219
                    2
 27   54   17  315
                    0
 37   86   17  401
                    1
 47  118   17  473
                   -0
 57  150   17  536
                   -3
* * * * * * * *
EXPONENT (N)=   0.787
CONSTANT (C)=  22.935
CORRELATION =  99.887
STND. ERROR =   3.355
* * * * * * * *
EQUIVALENT LEAKAGE AREA:
   ELA  M2 =   0.059
    ELA FT2 =   0.635

FORCED AIR CHANGE/HOUR:
 ACH @50 PA =   4.415
* * * * * * * *
```

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name ~~of Builder~~ Miss SARAH MACDONALD

Address of Builder _____ Phone No. 902 · 765-6187

Address of Building McGEE DRIVE, KINGSTON, KINGS CO, N.S.

Name of Test Technician GARY O'CONNOR.

Name of Testing Firm* Buchan, Lawton, Parent Ltd.

Address of Testing Firm 5370 Canotek Road
Ottawa, Ontario K1J 8X7 Phone No. (613) 748-3762

Date of Test JAN. 29/86. Time of Test 2:00 P.M.

Date of Report _____ _____
(Signature - Technician)*

WEATHER DATA (DATA FROM THIS MORNINGS TEST

Outdoor Temperature -7 °C Barometric Pressure 100.8 kPa

Wind Speed _____ Km/h Wind Direction _____

Wind Variability _____ LIGHT BREEZE

EQUIPMENT USED

Manufacturer Retrotec

Type Model 501 Serial No. 141

Flow Measuring Technique Nozzle X Fan Speed ____ Orifice ____

Calibration Range of Flow Measuring Device ✓ L/s to _____ L/s

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote ____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No ____

BUILDING UNDER TEST

Floor area (including basement) 2(10.69 X 7.60) = 162.5 m^2 Volume (10.69 x 7.60 x 5.0) = 407. m^3
(From HOTCAN Data Sheet)

Type of House (Bungalow, tri-level, two storey, etc.) SPLIT ENTRY

Special Features (Cathedral ceiling, crawlspaces, etc.) HAS HRV ON CENTRAL VENTILATION FAN.

* Firms must be listed with HUDAC in order to perform this test

```
*  *  *  *  *  *  *  *
   ENERCARE
   AIR LEAKAGE TEST
*  *  *  *  *  *  *  *
CMHC 2227
B DEVEAU
JAN 30/86
TEST NO. BACKDRA
BAROMETRIC 101.9
OUTDOOR TEMP -6.(C)
WIND SPEED 13(KPH)
VOLUME:   373.M3
*  *  *  *  *  *  *  *
PA DATA TPIN FLOW ERR
   (12) (C)  L/S    %

 17   48   20  294
                   -2
 27   96   20  422
                    2
 37  143   20  519
                    1
 47  180   20  586
                   -2
 57  240   20  680
                   -0
*  *  *  *  *  *  *  *
EXPONENT (N)=   0.679
CONSTANT (C)=  43.763
CORRELATION =  99.758
STND. ERROR =   2.643
*  *  *  *  *  *  *  *
EQUIVALENT LEAKAGE AREA:
    ELA  M2 =   0.088
    ELA FT2 =   0.950

FORCED AIR CHANGE/HOUR:
 ACH @50 PA =   6.035
*  *  *  *  *  *  *  *
```

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name ~~of Builder~~ MR & MRS BERNARD DEVEAU

Address of Builder _____ Phone No. _____

Address of Building BARTON, N.SCOTIA

Name of Test Technician GARY O'CONNOR

Name of Testing Firm* Buchan, Lawton, Parent Ltd.

Address of Testing Firm 5370 Canotek Road
Ottawa, Ontario K1J 8X7 Phone No. (613) 748-3762

Date of Test JAN 30/86 Time of Test 10:30 A.M.

Date of Report _____ _____
(Signature - Technician)*

WEATHER DATA DATA from C.F.B. CORNWALLIS IN Digby NS. 902-765-3391

Outdoor Temperature −6 °C Barometric Pressure 101.9 kPa

Wind Speed 13 Km/h Wind Direction E, N.E, 170°

Wind Variability 600D. (WHEATHER STA. APPROX. 10 miles from house)

EQUIPMENT USED

Manufacturer Retrotec

Type Model 501 Serial No. 141

Flow Measuring Technique Nozzle X Fan Speed _____ Orifice _____

Calibration Range of Flow Measuring Device _____ L/s to _____ L/s

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote _____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No _____

BUILDING UNDER TEST

Floor area (including basement) 149.4 m^2 (2(6.98 X 10.70))

Volume 373. m^3 (5.0 X 6.98 X 10.70)
(From HOTCAN Data Sheet)

Type of House (Bungalow) tri-level, two storey, etc.) _____

Special Features (Cathedral ceiling, crawlspaces, etc.) HAS ASTON CENTRAL EXHAUST FAN, + WOODSTOVE, ELECT. BASEBOARD HEATING

* Firms must be listed with HUDAC in order to perform this test

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name ~~of Builder~~ R. MELANSON

Address of Builder _____ Phone No. 902-245-2026

Address of Building BARTON, Digby Co, N.Scotia

Name of Test Technician GARY O'CONNOR

Name of Testing Firm* Buchan, Lawton, Parent Ltd.

Address of Testing Firm 5370 Canotek Road, Ottawa, Ontario K1J 8X7 Phone No. (613) 748-3762

Date of Test JAN 30/86. Time of Test 2:30 P.M.

Date of Report _____ _____ (Signature - Technician)*

WEATHER DATA DATA from C.F.B. CORNWALLIS in DIGBY, N.S. for 2:00 p.m.

Outdoor Temperature -5 °C Barometric Pressure 101.5 kPa

Wind Speed 12 Km/h Wind Direction 040°

Wind Variability 0:6

EQUIPMENT USED

Manufacturer Retrotec

Type Model 501 Serial No. 141

Flow Measuring Technique Nozzle X Fan Speed _____ Orifice _____

Calibration Range of Flow Measuring Device _____ L/s to _____ L/s

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote _____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No _____

BUILDING UNDER TEST

1ST FLOOR (7.06 X 10.69) + (2.93 X 10.69) = 75.4 NO + BASEMENT 31.3

Floor area (~~including basement~~) 107 m^2 Volume 295 m³ (From HOTCAN Data Sheet)

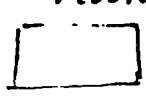
Type of House (Bungalow, tri-level, two storey, etc.) (69.1+226) NO BASEMENT

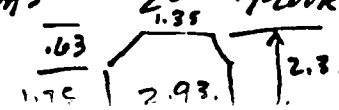
Special Features (Cathedral ceiling, crawlspaces, etc.) KNEEWALLS WOODSTOVE, ASTON CENTRAL EXHAUST FAN

---

* Firms must be listed with HUDAC in order to perform this test

VOLUME 1ST FLOOR (7.06 X 10.69) X 3.0 = 226 m³





2nd FLOOR 10.69 [(2.93 X 1.75) + (2.14 X 1.35)] = 10.69 (5.12 + 1.34) = 69.1

```
*  *  *  *  *  *  *  *
   ENERCARE
   AIR LEAKAGE TEST
*  *  *  *  *  *  *  *
CMHC 2277
S  AMBROSE
JAN 30/86
TEST NO. BACKDRA
BAROMETRIC 101.5
OUTDOOR TEMP -3.(C)
WIND SPEED 12(KPH)
VOLUME:   295.M3
*  *  *  *  *  *  *  *
PA DATA TPIN FLOW ERR
   (12) (C)  L/S    %

 14   14   17  157
                   -3
 19   25   17  213
                    1
 29   51   17  309
                    3
 39   80   17  391
                    2
 49  109   17  459
                   -0
 59  140   17  523
                   -3
*  *  *  *  *  *  *  *
EXPONENT (N)=   0.831
CONSTANT (C)=  18.173
CORRELATION =  99.815
STND. ERROR =   3.202
*  *  *  *  *  *  *  *
EQUIVALENT LEAKAGE AREA:
    ELA  M2 =   0.051
    ELA FT2 =   0.555

FORCED AIR CHANGE/HOUR:
 ACH @50 PA =   5.741
*  *  *  *  *  *  *  *
```

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name ~~of Builder~~ R. MCMANUS S. AMBROSE

Address of Builder _____ Phone No. _____

Address of Building NORTH RANGE, DIGBY CO. N.S.

Name of Test Technician GARY O'CONNOR

Name of Testing Firm* Buchan, Lawton, Parent Ltd.

Address of Testing Firm 5370 Canotek Road
Ottawa, Ontario K1J 8X7 Phone No. (613) 748-3762

Date of Test JAN. 30/86 Time of Test 5.45 P.M.

Date of Report _____ _____
(Signature - Technician)*

WEATHER DATA (DATA FOR 2:00 P.M. FROM C.F.B. CORNWALLIS, DIGBY, N.S.

Outdoor Temperature ~~-8~~ -3 °C Barometric Pressure 101.5 kPa

Wind Speed 12 Km/h Wind Direction _____

nd Variability (WINDS LIGHT & CLOSE TO CALM.

EQUIPMENT USED

Manufacturer Retrotec

Type Model 501 Serial No. 141

Flow Measuring Technique Nozzle X Fan Speed _____ Orifice _____

Calibration Range of Flow Measuring Device _____ L/s to _____ L/s

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote _____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No _____

BUILDING UNDER TEST

Floor area (including basement) 107 m^2 Volume 295 m³
(From HOTCAN Data Sheet)

Type of House (Bungalow, tri-level, two storey, etc.) NO BASEMENT

Special Features (Cathedral ceiling, crawlspaces, etc.) KNEEWALLS
WOODSTOVE, ASTON FAN & EXHAUST FAN.

---

* Firms must be listed with HUDAC in order to perform this test

```
* * * * * * * *
  ENERCARE
   AIR LEAKAGE TEST
* * * * * * * *
CHHC 2277
S TITUS
JAN 31/86
TEST NO. BACKDRA
BAROMETRIC 101.
OUTDOOR TEMP -4.(C)
WIND SPEED CALM(KPH)
VOLUME:   364.M3
* * * * * * * *
PA DATA TPIN FLOW ERR
   (12) (C)  L/S    %

 12    9   20  124
                   -1
 17   16   20  168
                    0
 27   34   20  248
                    2
 37   54   20  316
                    1
 47   73   20  370
                   -1
 57   98   20  432
                   -1
* * * * * * * *
EXPONENT (N)=   0.795
CONSTANT (C)=  17.572
CORRELATION =  99.915
STND. ERROR =   2.232
* * * * * * * *
EQUIVALENT LEAKAGE AREA:
   ELA  M2 =   0.045
   ELA FT2 =   0.494

FORCED AIR CHANGE/HOUR:
 ACH @50 PA =   3.909
* * * * * * * *
```

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name ~~of Builder~~ S. Titus

Address of Builder _____ Phone No. 902-839-248

Address of Building Tiverton, Digby Co, N.S.

Name of Test Technician Gary O'Connor

Name of Testing Firm* Buchan, Lawton, Parent Ltd.

Address of Testing Firm 5370 Canotek Road
Ottawa, Ontario K1J 8X7 Phone No. (613) 748-3762

Date of Test JAN. 31/86 Time of Test 11:00 A.M.

Date of Report _____ _____
(Signature - Technician)*

WEATHER DATA Temperature measured
Bar. Pres. (guessed) sunny & dry.

Outdoor Temperature −4 °C Barometric Pressure 101. kPa

Wind Speed CALM Km/h Wind Direction —

nd Variability _____

EQUIPMENT USED

Manufacturer Retrotec

Type Model 501 Serial No. 141

Flow Measuring Technique Nozzle X Fan Speed _____ Orifice _____

Calibration Range of Flow Measuring Device _____ L/s to _____ L/s

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote _____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No _____

BUILDING UNDER TEST

Floor area (including basement) 145.8 m^2 (2X 6.91X10.55)

Volume 364 m (6.91X10.55X5.0)
(From HOTCAN Data Sheet

Type of House (Bungalow, tri-level, two storey, etc.) _____

Special Features (Cathedral ceiling, crawlspaces, etc.) -0 _____

---

* Firms must be listed with HUDAC in order to perform this test

```
*  *  *  *  *  *  *  *
   ENERCARE
   AIR LEAKAGE TEST
*  *  *  *  *  *  *  *
CMHC 2277
P LOGAN
FEB 1/86
TEST NO. BACKDRA
BAROMETRIC 102.5
OUTDOOR TEMP -12.(C)
WIND SPEED 15KNOTS
VOLUME:   330.M3
*  *  *  *  *  *  *  *
PA DATA TPIN FLOW ERR
   (12) (C)  L/S    %

 11   11   20  133
                   -3
 16   25   20  195
                    4
 21   30   20  224
                   -3
 31   63   20  330
                    3
 41   91   20  400
                    0
 51  120   20  462
                   -3
 61  170   20  554
                    0
*  *  *  *  *  *  *  *
EXPONENT (N)=   0.812
CONSTANT (C)=  19.588
CORRELATION =  99.783
STND. ERROR =   3.773
*  *  *  *  *  *  *  *
EQUIVALENT LEAKAGE AREA:
    ELA  M2 =   0.054
    ELA FT2 =   0.585

FORCED AIR CHANGE/HOUR:
 ACH @50 PA =   5.121
*  *  *  *  *  *  *  *
```

Revised 23-08-83

R-2000 SUPER ENERGY EFFICIENT HOME PROGRAM
STANDARD AIRTIGHTNESS TEST REPORT

Name ~~of Builder~~ PETER LOGAN.

Address of Builder _____ Phone No. 902-885-25

Address of Building SHEET HARBOUR, N.S.

Name of Test Technician GARY O'CONNOR

Name of Testing Firm* Buchan, Lawton, Parent Ltd.

Address of Testing Firm 5370 Canotek Road
Ottawa, Ontario K1J 8X7 Phone No. (613) 748-376

Date of Test FEB. 1/86. Time of Test 12:NOON

Date of Report _____ _____
(Signature - Technician)*

1.58 ft² / 1.5 AC.

WEATHER DATA FROM. SHEARWATER WHEATER
902-463-5111 EXT 409

Outdoor Temperature -12 °C Barometric Pressure 102.5 k

Wind Speed 28 K.P.H 15 KNOTS. Km/h Wind Direction 300°.

nd Variability (IN SHEET HARBOUR HOUSE WELL SHIELDED, & WINDS M SMALL

EQUIPMENT USED

Manufacturer Retrotec

Type Model 501 Serial No. 141

Flow Measuring Technique Nozzle X Fan Speed _____ Orifice _____

Calibration Range of Flow Measuring Device _____ L/s to _____ L/

Type of Outdoor Pressure Tap System Used: Four Wall ✓ Remote _____

Does equipment automatically calculate "Corrected" Data? Yes ✓ No _____

---

2 (7.5 X 8.8) BUILDING UNDER TEST

Floor area (including basement) 132 m² Volume 330
(From HOTCAN Data She

Type of House (Bungalow, tri-level, two storey, etc.) split entry

Special Features (Cathedral ceiling, crawlspaces, etc.) _____

---

* Firms must be listed with HUDAC in order to perform this test

APPENDIX C

COMBUSTION VENTILATION SAFETY CHECK 1

Address Street Municipality — Arr. time __:__ Date JAN 27/E[illegible]
DEBERT, COLCHESTER CO, N.S. — Compl. time __:__ RETURNED FEB 2/[illegible]

1 Results Summary — CHIMNEY INSPECTION

ALL OK ☑ NOT DONE ☐ MAINTENANCE RECOMMENDED ☑ MAINTENANCE REQ'D ☐
PROBLEMS (specify A1, A2, etc) WOODSTOVE'S STOVEPIPES SHOULD BE SERVICED
WOODSTOVE CONNECTED TO 8"Ø INTERIOR PRE-FAB CHIMNEY WITH SHEET METAL SCREWS

INSPECTION LIST: (FURNACE=A DHW=B FIREPLACE=C)

1 cap needs repair ✓	6 lining needs repair ✓	11 flue connector corroded ✓
2 clearance insufficient ✓	7 ~~lining missing (gas)~~	12 damper imbalanced ✓
3 supports inadequate ✓	8 creosote excessive ✓	13 ~~hood stained or rusted~~
4 ~~brickwork needs repair~~	9 flue wrong size ✓	14 connector design problem ✓
5 top sooted or stained ✓	10 flue connector loose ✓	15 ~~fuel odours present~~

16 ~~blower compartment loose~~	
17 ~~filter plugged~~	
18 ~~burner dirty or sooted~~	
19 air supply plugged ✓	
20 inlet poorly located ✓	

2 Results Summary — FURNACE ROOM VENT/PRESSURE TEST

ALL OK ☐ NOT DONE ☐ N/A ☐ INITIAL FAILURE ☐
Initial Pressure: FANS 2way ___ exhaust ___ blower ___ FIRE sm ___ lg ___
Reduced Pressure: FANS 2way ___ exhaust ___ blower ___ FIRE sm ___ lg ___
Relief Measures Taken: ___

CLOSE: ext doors ☑ windows ☑ int doors ☑
~~PURN OFF: furnace pilot ☐ DHW ☐ stove ☐~~
SET UP: tubing ☑ gauge ☑
CLOSE INLETS: furnace rm ☐ house ☐ firepl ☐
CLOSE CHIMNEYS: furn ☐ DHW ☐ fpl dampers ☐
FANS OFF & COVERS REMOVED: ☑

ZERO GAUGE: ☑
OPERATE FANS: range ☑ stovetop ☐ bath1 ☐ bath2 ☐ bath3 ☐ dryer ☑ vacuum ☐ special ☐
RECORD PRESSURES: fans on ☑ blower on ☐ (Fails? inlets open ☐ labels applied ☐)

PREPARE SA FPL: window open ☐ chimney open ☐ air supply open ☐ firepl doors open ☐ burner high ☐ check draft ☐ window closed
CHECK FPL SPILLAGE: ☐ (Fails: close firepl OR open window ☐ apply label ☐)
RECORD PRESSURE: ☐ (Fails? close fireplace doors ☐ apply labels ☐)

3 Results Summary — HEAT EXCHANGER LEAKAGE TEST

ALL OK ☐ NOT DONE ☐ SLIGHT FAILURE ☐ MAJOR FAILURE ☐
Describe leakage: ___

(GAS)
PREPARATION: pilot light off ☐ flue still plugged ☑
PREPARE EQUIPMENT: smoke ready ☐ light on ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke checks ☐
RESET FURNACE: blower off ☐ chimney open ☐ pilot lit ☐

(OIL)
PREPARATION: ensure burner off ☐ flue still plugged ☐ register open ☐ port open ☐ smoke candle & lighter ready ☐
PREPARE EQUIPMENT: smoke ready ☐ port open ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke check ☐
RESET FURNACE: blower off ☐ chimney open ☐ port closed ☐

4 Results Summary — FURNACE ROOM SPILLAGE TEST

ALL OK ☐ SPILL FAILURE ☐ OVERFIRING ☐ EXCESS CO ☐ LOW DRAFT ☐
Furnace: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
DHW: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
Gas Furnace Firing Rate: actual ___ nominal ___ % overfiring ___ CO ppm ___
Gas DHW Firing Rate: actual ___ nominal ___ % overfiring ___ CO ppm ___
Oil Furnace Draft Measurement (Pascals) ___

ENSURE CONTINUED OPERATION: fans ☐ fireplaces ☑
FURNACE OPERATION: open flues ☐ stand aside ☐ turn it on ☐
OBSERVE & TIME SPILLAGE: port ☐ hood ☐ damper ☐ joints ☐
RECHECK SPILLAGE AFTER BLOWER OPERATES: ☐
MEASURE OIL CHIMNEY DRAFT: connect static tip ☐ record draft ☐

CLOCK GAS METER: record seconds ☐ cubic feet ☐ BTU/HR ☐
RECORD FIRING RATES: actual ☐ nominal ☐ % calculation ☐
SAMPLE CO IN FLUE GAS: hand pump ☐ record ppm ☐
DHW OPERATION: turn it on ☐ recheck spillage ☐ sample CO ☐ record CO ppm ☐

5 Results Summary — FIREPLACE VENT/PRESSURE TEST

ALL OK ☐ NOT DONE ☐ INITIAL FAILURE ☑ WOODSTOVE
SML: (Pa) 9.5 ; repeated with: inlets open ___, doors shut ___, lg fpl off ___, or relief opening req'd of ___ mm x ___ mm
LGE: (Pa) ___ ; repeated with: inlets open ___, doors shut ___, lg fpl off ___, or relief opening req'd of 50 mm x 900 mm WINDOW

ENSURE CONT. OPERATION: fans ☑ furnace ☐ DHW ☐ lg/sm fpl ☐
RELOCATE INDOOR TUBE TO FIREPLACE ROOM: small ☐ large ☐
~~PREPARE SA/LS FIREPLACE: burner off ☐ air inlets open ☐~~
~~chimney damper closed ☐ fireplace doors open ☐~~

RECORD PRESSURE: ☐ (Fails? determine best remedial measure:
1. open any inlets to furnace rm or house ☐ passes ☐
2. close any fpl doors & relocate tubing ☐ passes ☐
3. shut off any other fpl ☐ passes ☐

COMPLETION:
ENSURE FLUES OPEN: furnace ☐ DHW ☐ stove ☑ OPEN INLETS: furnace rm ☐ house ☐ crawl sp ☐
RESET: furnace pilot ☐/thermostat ☐ DHW valve ☐ CHECK FURNACE OPERATION: full cycle ☐ flame colour ☐
fans ☐ fireplace dampers ☐ ☐

0

A RECORD OF REMEDIAL ACTIONS TAKEN:

LABELS APPLIED — Exhaust Fan ___ Combustion air ___ Fresh air ___ Blower ___
Sml Fireplace ___ Lge Fireplace ___ Furnace ___ DHW ___

ADVICE TO OCCUPANT — Verbal Explanation ✓ Literature ___
Referral to ___

INLET INSTALLED — Size ___ Location ___

OTHER WORK

FOLLOW-UP REQUIRED — None ___ Urgent ___ Today ___ Routine ___ Optional ✓
(Details:)

→ HOMEOWNERS DO NOT USE RANGE FAN, CLOTHES DRYER OR BATHROOM FANS @ NIGHT (i.e DO NOT let them run while they are asleep)

TABLE 1: SUGGESTED TOOL LIST

1 INSPECTION:
-- adj. mirror
-- flash
-- ratchet
-- multi-screwdriver
-- binoculars
-- tape measure
-- fan labels
-- inlet labels
-- fireplace labels

2&3 FURNACE OR FIREPLACE ROOM TESTING:
-- manometer
-- tubing & connectors
-- 3" masking tape
-- balloons & tube

FIREPLACES:
-- propane stovetop
-- butane lighter
-- propane cannister

3 HEAT EXCHANGER:
-- smoke extension kit
-- smoke pencil

4 CHIMNEY SPILLAGE:
-- propane stove
-- butane lighter
-- timepiece
-- hand pump
-- CO tubes
-- static pressure ti

TABLE 2 : MAXIMUM ALLOWABLE DEPRESSURIZATION (MAD Limits)

APPLIANCE	IGNITION	DRAFT	TOTAL CHIMNEY HEIGHT (m)	LIMIT (Pa)
Gas-fired DHW	pilot	natural	NA	3.0
	electronic	natural	NA	3.0
	electronic	induced	NA	5.0
Oil-fired DHW	electronic	natural	NA	4.0
Gas furnace/boiler	pilot	natural	2 - 4	4.0
	pilot	natural	4 - 8	3.0
	electronic	natural	2 - 4	3.0
	electronic	natural	4 - 8	4.0
	electronic	induced	NA	6.0
	pilot	forced	NA	6.0
Oil furnace/boiler	electronic	natural	NA	4.0
	pilot	forced	NA	4.0
Fireplaces	NA	natural	NA	3.0

FIRING RATE CALCULATIONS:

Thousand BTU/hr Input = $\frac{\text{seconds req'd for dial to record 1 ft}^3}{3852}$

Percentage Overfiring = $\frac{\text{actual rate} - \text{nominal rate}}{\text{nominal rate}} \times 100$

COMBUSTION VENTILATION SAFETY CHECK 1 - [illegible]

Address: Street / Municipality — Arr. time __:__ Date JAN 20th/[illegible]
FALMOUTH, Hants Co, N.S. — Compl. time __:__

1 CHIMNEY INSPECTION

Results: ALL OK ☑ NOT DONE ☐ MAINTENANCE RECOMMENDED ☐ MAINTENANCE REQ'D ☐
Summary: PROBLEMS (specify A1 A2, etc) C-1 NO CHIMNEY CAP
WOODSTOVE CONNECTED TO A INSIDE MASONRY CHIMNEY.

INSPECTION LIST: (FURNACE=A DHW=B FIREPLACE=C)

1 cap needs repair ✓	6 lining needs repair ✓	11 flue connector corroded ✓	16 blower compartment loose
2 clearance insufficient ✓	7 ~~lining missing (gap)~~	12 damper imbalanced ✓	17 ~~filter plugged~~
3 supports inadequate ✓	8 creosote excessive ✓	13 ~~hood stained or rusted~~	18 ~~burner dirty or sooted~~
4 brickwork needs repair ✓	9 flue wrong size ✓	14 connector design problem ✓	19 air supply plugged ✓
5 top sooted or stained ✓	10 flue connector loose ✓	15 ~~fuel odours present~~	20 inlet poorly located ✓

2 FURNACE ROOM VENT/PRESSURE TEST

Results: ALL OK ☐ NOT DONE ☐ N/A ☑ INITIAL FAILURE ☐
Summary: Initial Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Reduced Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Relief Measures Taken: _____

CLOSE: ext doors ☐ windows ☐ int doors ☐
TURN OFF: furnace pilot ☐ DHW ☐ stove ☐
SET UP: tubing ☐ gauge ☐
CLOSE INLETS: furnace rm ☐ house ☐ firepl ☐
CLOSE CHIMNEYS: furn ☐ DHW ☐ fpl dampers ☐
FANS OFF & COVERS REMOVED: ☐

ZERO GAUGE: ☐
OPERATE FANS: range ☐ stovetop ☐
bath1 ☐ bath2 ☐ bath3 ☐ dryer ☐
vacuum ☐ special ☐
RECORD PRESSURES: fans on ☑ blower on ☐
(Fails? inlets open ☐ labels applied ☐)

PREPARE SM FPLs: window open ☐ chimney open ☐
air supply open ☐ firepl doors open ☐
burner high ☐ check draft ☐ window closed ☐
CHECK FPL SPILLAGE: ☐ (Fails: close firepl OR open window ☐ apply label ☐)
RECORD PRESSURE: ☐ (Fails? close fireplace doors ☐ apply labels ☐)

3 HEAT EXCHANGER LEAKAGE TEST

Results: ALL OK ☐ NOT DONE ☐ SLIGHT FAILURE ☐ MAJOR FAILURE ☐
Summary: Describe leakage: _____

(GAS)
PREPARATION: pilot light off ☐ flue still plugged ☐
PREPARE EQUIPMENT: smoke ready ☐ light on ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke checks ☐
RESET FURNACE: blower off ☐ chimney open ☐ pilot lit ☐

(OIL)
PREPARATION: ensure burner off ☐ flue still plugged ☐
register open ☐ port open ☐ smoke candle & lighter ready ☐
PREPARE EQUIPMENT: smoke ready ☐ port open ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke check ☐
RESET FURNACE: blower off ☐ chimney open ☐ port closed ☐

4 FURNACE ROOM SPILLAGE TEST

Results: ALL OK ☐ SPILL FAILURE ☐ OVERFIRING ☐ EXCESS CO ☐ LOW DRAFT ☐
Summary: Furnace: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
DHW: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
Gas Furnace Firing Rate: actual___ nominal___ % overfiring ___ CO ppm___
Gas DHW Firing Rate: actual___ nominal___ % overfiring ___ CO ppm___
Oil Furnace Draft Measurement (Pascals) ___

ENSURE CONTINUED OPERATION: fans ☐ fireplaces ☐☐
FURNACE OPERATION: open flues ☐ stand aside ☐ turn it on ☐
OBSERVE & TIME SPILLAGE: port ☐ hood ☐ damper ☐ joins ☐
RECHECK SPILLAGE AFTER BLOWER OPERATES: ☐
MEASURE OIL CHIMNEY DRAFT: connect static tip ☐ record draft ☐

CLOCK GAS METER: record seconds ☐ cubic feet ☐ BTU/HR ☐
RECORD FIRING RATES: actual ☐ nominal ☐ % calculation ☐
SAMPLE CO IN FLUE GAS: hand pump ☐ record ppm ☐
DHW OPERATION: turn it on ☐ recheck spillage ☐ sample CO ☐
record CO ppm ☐

5 FIREPLACE VENT/PRESSURE TEST

WOODSTOVE

Results: ALL OK ☑ NOT DONE ☐ INITIAL FAILURE ☐
Summary: SML: (Pa) 2.5 ; repeated with: inlets open___, doors shut___,
lg fpl off___, or relief opening req'd of ___mm x ___mm
LGE: (Pa)___; repeated with: inlets open___, doors shut___,
lg fpl off___, or relief opening req'd of ___mm x ___mm

ENSURE CONT. OPERATION: fans ☑ furnace ☐ DHW ☐ lg/sm fpl ☐
RELOCATE INDOOR TUBE TO FIREPLACE ROOM: small ☐ large ☐
PREPARE SM/LS FIREPLACE: burner off ☐ air inlets open ☐
chimney damper closed ☐ fireplace doors open ☐

RECORD PRESSURE: ☐ (Fails? determine best remedial measure:
1. open any inlets to furnace rm or house ☐ passes ☐
2. close any fpl doors & relocate tubing ☐ passes ☐
3. shut off any other fpl ☐ passes ☐

COMPLETION:
ENSURE FLUES OPEN: furnace ☐ DHW ☐ stove ☐ OPEN INLETS: furnace rm ☐ house ☐ crawl sp ☐
RESET: furnace pilot ☐/thermostat ☐ DHW valve ☐ CHECK FURNACE OPERATION: full cycle ☐ flame colour ☐
fans ☐ fireplace dampers ☐ ☐

A RECORD OF REMEDIAL ACTIONS TAKEN:

LABELS APPLIED Exhaust Fan ___ Combustion air ___ Fresh air ___ Blower ___
Sml Fireplace ___ Lge Fireplace ___ Furnace ___ DHW ___

ADVICE TO OCCUPANT Verbal Explanation ___ Literature ___
Referral to ___

INLET INSTALLED Size ___ Location ___

OTHER WORK ___

FOLLOW-UP REQUIRED None ___ Urgent ___ Today ___ Routine ___ Optional ___
(Details:) ___

TABLE 1: SUGGESTED TOOL LIST

1 INSPECTION:
__ adj. mirror
__ flash
__ ratchet
__ multi-screwdriver
__ binoculars
__ tape measure
__ fan labels
__ inlet labels
__ fireplace labels

2&3 FURNACE OR FIREPLACE ROOM TESTING:
__ manometer
__ tubing & connectors
__ 3" masking tape
__ balloons & tube

FIREPLACES:
__ propane stovetop
__ butane lighter
__ propane cannister

3 HEAT EXCHANGER:
__ smoke extension kit
__ smoke pencil

4 CHIMNEY SPILLAGE:
__ propane stove
__ butane lighter
__ timepiece
__ hand pump
__ CO tubes
__ static pressure tip

TABLE 2 : MAXIMUM ALLOWABLE DEPRESSURIZATION (MAD Limits)

APPLIANCE	IGNITION	DRAFT	TOTAL CHIMNEY HEIGHT (m)	LIMIT (Pa)
Gas-fired DHW	pilot	natural	NA	3.0
	electronic	natural	NA	3.0
	electronic	induced	NA	5.0
Oil-fired DHW	electronic	natural	NA	4.0
Gas furnace/boiler	pilot	natural	2 - 4	4.0
	pilot	natural	4 - 8	5.0
	electronic	natural	2 - 4	3.0
	electronic	natural	4 - 8	4.0
	electronic	induced	NA	6.0
	pilot	forced	NA	6.0
Oil furnace/boiler	electronic	natural	NA	4.0
	pilot	forced	NA	4.0
Fireplaces	NA	natural	NA	3.0

O.K

FIRING RATE CALCULATIONS:

Thousand BTU/hr Input = $\frac{\text{seconds req'd for dial to record 1 ft}^3}{3352}$

Percentage Overfiring = $\frac{\text{actual rate} - \text{nominal rate}}{\text{nominal rate}} \times 100$

COMBUSTION VENTILATION SAFETY CHECK 1.5

Address Street Municipality — Arr. time __:__ Date JAN. 28/82
NEWPORT, HANTS Co, N.S. — Compl. time __:__

1 CHIMNEY INSPECTION

Results Summary — ALL OK ☒ NOT DONE ☐ MAINTENANCE RECOMMENDED ☑ MAINTENANCE REQ'D ☐
PROBLEMS (specify A1, A2, etc) → USE SHEET METAL SCREWS TO SECURE STOVE PIPES
WOODSTOVE CONNECTED TO INTERIOR MASONRY CHIMNEY

INSPECTION LIST: (FURNACE=A DHW=B FIREPLACE=C)

1 cap needs repair	6 lining needs repair	11 flue connector corroded	16 blower compartment loose
2 clearance insufficient	7 lining missing (gas)	12 damper imbalanced	17 filter plugged
3 supports inadequate	8 creosote excessive	13 hood stained or rusted	18 burner dirty or sooted
4 brickwork needs repair	9 flue wrong size	14 connector design problem	19 air supply plugged
5 too sooted or stained	10 flue connector loose	15 fuel odours present	20 inlet poorly located

2 FURNACE ROOM VENT/PRESSURE TEST

Results Summary — ALL OK ☐ NOT DONE ☐ N/A ☐ INITIAL FAILURE ☐
Initial Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Reduced Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Relief Measures Taken: _____

CLOSE: ext doors ☐ windows ☐ int doors ☐
TURN OFF: furnace pilot ☐ DHW ☐ stove ☐
SET UP: tubing ☐ gauge ☐
CLOSE INLETS: furnace rm ☐ house ☐ firepl ☐
CLOSE CHIMNEYS: furn ☐ DHW ☐ fpl dampers ☐
FANS OFF & COVERS REMOVED: ☐

ZERO GAUGE: ☐
OPERATE FANS: range ☐ stovetop ☐ bath1 ☐ bath2 ☐ bath3 ☐ dryer ☐ vacuum ☐ special ☐
RECORD PRESSURE: fans on ☑ blower on ☐ (Fails? inlets open ☐ labels applied ☐)

PREPARE SM FPL: window open ☐ chimney open ☐ air supply open ☐ firepl doors open ☐ burner high ☐ check draft ☐ window closed ☐
CHECK FPL SPILLAGE: ☐ (Fails: close firepl OR open window ☐ apply label ☐)
RECORD PRESSURE: ☐ (Fails? close fireplace doors ☐ apply labels ☐)

3 HEAT EXCHANGER LEAKAGE TEST

Results Summary — ALL OK ☐ NOT DONE ☐ SLIGHT FAILURE ☐ MAJOR FAILURE ☐
Describe leakage: _____

(GAS)
PREPARATION: pilot light off ☐ flue still plugged ☐
PREPARE EQUIPMENT: smoke ready ☐ light on ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke checks ☐
RESET FURNACE: blower off ☐ chimney open ☐ pilot lit ☐

(OIL)
PREPARATION: ensure burner off ☐ flue still plugged ☐ register open ☐ port open ☐ smoke candle & lighter ready ☐
PREPARE EQUIPMENT: smoke ready ☐ port open ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke check ☐
RESET FURNACE: blower off ☐ chimney open ☐ port closed ☐

4 FURNACE ROOM SPILLAGE TEST

Results Summary — ALL OK ☐ SPILL FAILURE ☐ OVERFIRING ☐ EXCESS CO ☐ LOW DRAFT ☐
Furnace: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
DHW: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
Gas Furnace Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Gas DHW Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Oil Furnace Draft Measurement (Pascals) ____

ENSURE CONTINUED OPERATION: fans ☐ fireplaces ☐
FURNACE OPERATION: open flues ☐ stand aside ☐ turn it on ☐
OBSERVE & TIME SPILLAGE: port ☐ hood ☐ damper ☐ joins ☐
RECHECK SPILLAGE AFTER BLOWER OPERATES: ☐
MEASURE OIL CHIMNEY DRAFT: connect static tip ☐ record draft ☐

CLOCK GAS METER: record seconds ☐ cubic feet ☐ BTU/HR ☐
RECORD FIRING RATES: actual ☐ nominal ☐ % calculation ☐
SAMPLE CO IN FLUE GAS: hand pump ☐ record ppm ☐
DHW OPERATION: turn it on ☐ recheck spillage ☐ sample CO ☐ record CO ppm ☐

5 FIREPLACE VENT/PRESSURE TEST

Results Summary — ALL OK ☐ NOT DONE ☐ INITIAL FAILURE ☑ WOODSTOVE
SML: (Pa) 50: repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of _____mm x_____mm
LGE: (Pa)___; repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of 50 mm x 900 mm

ENSURE CONT. OPERATION: fans ☐ furnace ☐ DHW ☐ lg/sm fpl ☐
RELOCATE INDOOR TUBE TO FIREPLACE ROOM: small ☐ large ☐
PREPARE SM/LG FIREPLACE: burner off ☐ air inlets open ☐ chimney damper closed ☐ fireplace doors open ☐

RECORD PRESSURE: ☐ (Fails? determine best remedial measure:
1. open any inlets to furnace rm or house ☐ passes ☐
2. close any fpl doors & relocate tubing ☐ passes ☐
3. shut off any other fpl ☐ passes ☐

COMPLETION:
ENSURE FLUES OPEN: furnace ☐ DHW ☐ stove ☐ OPEN INLETS: furnace rm ☐ house ☐ crawl sp ☐
RESET: furnace pilot ☐/thermostat ☐ DHW valve ☐ CHECK FURNACE OPERATION: full cycle ☐ flame colour ☐
fans ☐ fireplace dampers ☐ ☐

A RECORD OF REMEDIAL ACTIONS TAKEN:

LABELS APPLIED — Exhaust Fan ___ Combustion air ___ Fresh air ___ Blower ___ Sml Fireplace ___ Lge Fireplace ___ Furnace ___ DHW ___

ADVICE TO OCCUPANT — Verbal Explanation ___ Literature _____ Referral to _____

INLET INSTALLED — Size _____ Location _____

OTHER WORK

FOLLOW-UP REQUIRED — None ___ Urgent ___ Today ___ Routine ___ Optional ___

(Details:)

TABLE 1: SUGGESTED TOOL LIST

1 INSPECTION:
- __ adj. mirror
- __ flash
- __ ratchet
- __ multi-screwdriver
- __ binoculars
- __ tape measure
- __ fan labels
- __ inlet labels
- __ fireplace labels

2&5 FURNACE OR FIREPLACE ROOM TESTING:
- __ manometer
- __ tubing & connectors
- __ 3" masking tape
- __ balloons & tube

FIREPLACES:
- __ propane stovetop
- __ butane lighter
- __ propane cannister

3 HEAT EXCHANGER:
- __ smoke extension kit
- __ smoke pencil

4 CHIMNEY SPILLAGE:
- __ propane stove
- __ butane lighter
- __ timepiece
- __ hand pump
- __ CO tubes
- __ static pressure tip

TABLE 2 : MAXIMUM ALLOWABLE DEPRESSURIZATION (MAD Limits)

APPLIANCE	IGNITION	DRAFT	TOTAL CHIMNEY HEIGHT (m)	LIMIT (Pa)
Gas-fired DHW	pilot	natural	NA	3.0
	electronic	natural	NA	3.0
	electronic	induced	NA	5.0
Oil-fired DHW	electronic	natural	NA	4.0
Gas furnace/boiler	pilot	natural	2 - 4	4.0
	pilot	natural	4 - 8	5.0
	electronic	natural	2 - 4	3.0
	electronic	natural	4 - 8	4.0
	electronic	induced	NA	6.0
	pilot	forced	NA	6.0
Oil furnace/boiler	electronic	natural	NA	4.0
	pilot	forced	NA	4.0
Fireplaces	NA	natural	NA	3.0

FIRING RATE CALCULATIONS:

Thousand BTU/hr Input = $\frac{\text{seconds req'd for dial to record 1 ft}^3}{3352}$

Percentage Overfiring = $\frac{\text{actual rate} - \text{nominal rate}}{\text{nominal rate}} \times 100$

COMBUSTION VENTILATION SAFETY CHECK 1.

Address: Street: FALMOUTH, HANTS CO, Municipality: N.S. Arr. time: __:__ Compl. time: __:__ Date: JAN 29/82 Jim

1 Results Summary — CHIMNEY INSPECTION (WOODSTOVE CONNECTED TO INTERIOR MASONRY CHIMNEY)

ALL OK ☑ NOT DONE ☐ MAINTENANCE RECOMMENDED ☐ MAINTENANCE REC'D ☐

PROBLEMS (specify A1 A2, etc) NO SHEET METAL SCREWS SECURING STOVEPIPES

INSPECTION LIST: (FURNACE=A DHW=B FIREPLACE=C)

1	cap needs repair ✓ NOCAP	6	lining needs repair ✓	11	flue connector corroded ✓	16	~~blower compartment loose~~
2	clearance insufficient ✓	7	~~lining missing (gas)~~	12	~~damper jammed open~~	17	~~filter plugged~~
3	supports inadequate ✓	8	creosote excessive ✓	13	~~hood obstructed or rusted~~	18	~~burner dirty or rusted~~
4	brickwork needs repair ✓	9	flue wrong size ✓	14	connector design problem ✓	19	air supply plugged ✓
5	too spotted or stained ✓	10	flue connector loose ✓	15	~~fuel odours present~~	20	inlet poorly located ✓

2 Results Summary — FURNACE ROOM VENT/PRESSURE TEST

ALL OK ☐ NOT DONE ☐ N/A ☐ INITIAL FAILURE ☐

Initial Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___

Reduced Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___

Relief Measures Taken: _____

CLOSE: ext doors ☐ windows ☐ int doors ☐
TURN OFF: furnace pilot ☐ DHW ☐ stove ☐
SET UP: tubing ☐ gauge ☐
CLOSE INLETS: furnace rm ☐ house ☐ firepl ☐
CLOSE CHIMNEYS: furn ☐ DHW ☐ fpl dampers ☐
FANS OFF & COVERS REMOVED: ☐

ZERO GAUGE ☐
OPERATE FANS: range ☐ stovetop ☐
bath1 ☐ bath2 ☐ bath3 ☐ dryer ☐
vacuum ☐ special ☐
RECORD PRESSURES: fans on ☐ blower on ☐
(Fails? inlets open ☐ labels applied ☐)

PREPARE SM FPL: window open ☐ chimney open ☐
air supply open ☐ firepl doors open ☐
burner high ☐ check draft ☐ window closed ☐
CHECK FPL SPILLAGE: ☐ (Fails? close firepl OR open window ☐ apply label ☐)
RECORD PRESSURE: ☐ (Fails? close fireplace doors ☐ apply labels ☐)

3 Results Summary — HEAT EXCHANGER LEAKAGE TEST

ALL OK ☐ NOT DONE ☐ SLIGHT FAILURE ☐ MAJOR FAILURE ☐

Describe leakage: _____

(GAS)
PREPARATION: pilot light off ☐ flue still plugged ☐
PREPARE EQUIPMENT: smoke ready ☐ light on ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke checks ☐
RESET FURNACE: blower off ☐ chimney open ☐ pilot lit ☐

(OIL)
PREPARATION: ensure burner off ☐ flue still plugged ☐
register open ☐ port open ☐ smoke candle & lighter ready ☐
PREPARE EQUIPMENT: smoke ready ☐ port open ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke check ☐
RESET FURNACE: blower off ☐ chimney open ☐ port closed ☐

4 Results Summary — FURNACE ROOM SPILLAGE TEST

ALL OK ☐ SPILL FAILURE ☐ OVERFIRING ☐ EXCESS CO ☐ LOW DRAFT ☐

Furnace: none ☐ temporary (sec)___ continuous ☐; slight ☐ major ☐
DHW: none ☐ temporary (sec)___ continuous ☐; slight ☐ major ☐

Gas Furnace Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Gas DHW Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Oil Furnace Draft Measurement (Pascals) ____

ENSURE CONTINUED OPERATION: fans ☐ fireplaces ☐
FURNACE OPERATION: open flues ☐ stand aside ☐ turn it on ☐
OBSERVE & TIME SPILLAGE: port ☐ hood ☐ damper ☐ joins ☐
RECHECK SPILLAGE AFTER BLOWER OPERATES: ☐
MEASURE OIL CHIMNEY DRAFT: connect static tip ☐ record draft ☐

CLOCK GAS METER: record seconds ☐ cubic feet ☐ BTU/HR ☐
RECORD FIRING RATES: actual ☐ nominal ☐ % calculation ☐
SAMPLE CO IN FLUE GAS: hand pump ☐ record ppm ☐
DHW OPERATION: turn it on ☐ recheck spillage ☐ sample CO ☐ record CO ppm ☐

5 Results Summary — FIREPLACE VENT/PRESSURE TEST

ALL OK ☑ NOT DONE ☐ INITIAL FAILURE ☐ WOODSTOVE

SML: (Pa) 1.5; repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of _____mm x_____mm

LGE: (Pa)___; repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of _____mm x_____mm

ENSURE CONT. OPERATION: fans ☐ furnace ☐ DHW ☐ lg/sm fpl ☐
RELOCATE INDOOR TUBE TO FIREPLACE ROOM: small ☐ large ☐
PREPARE SM/LG FIREPLACE: burner off ☐ air inlets open ☐ chimney damper closed ☐ fireplace doors open ☐

RECORD PRESSURE: ☐ (Fails? determine best remedial measure:
1. open any inlets to furnace rm or house ☐ passes ☐
2. close any fpl doors & relocate tubing ☐ passes ☐
3. shut off any other fpl ☐ passes ☐

COMPLETION:
ENSURE FLUES OPEN: furnace ☐ DHW ☐ stove ☐ OPEN INLETS: furnace rm ☐ house ☐ crawl sp ☐
RESET: furnace pilot ☐/thermostat ☐ DHW valve ☐ CHECK FURNACE OPERATION: full cycle ☐ flame colour ☐
fans ☐ fireplace dampers ☐ ☐

A RECORD OF REMEDIAL ACTIONS TAKEN:

LABELS APPLIED Exhaust Fan ___ Combustion air ___ Fresh air ___ Blower ___
Sml Fireplace ___ Lge Fireplace ___ Furnace ___ DHW ___

ADVICE TO OCCUPANT Verbal Explanation ___ Literature _____
Referral to _____

INLET INSTALLED Size _____ Location _____

OTHER WORK _____

FOLLOW-UP REQUIRED None ___ Urgent ___ Today ___ Routine ___ Optional ___
(Details:) _____

TABLE 1: SUGGESTED TOOL LIST

1 INSPECTION:
__ adj. mirror
__ flash
__ ratchet
__ multi-screwdriver
__ binoculars
__ tape measure
__ fan labels
__ inlet labels
__ fireplace labels

2&5 FURNACE OR FIREPLACE ROOM TESTING:
__ manometer
__ tubing & connectors
__ 3" masking tape
__ balloons & tube

FIREPLACES:
__ propane stovetop
__ butane lighter
__ propane cannister

3 HEAT EXCHANGER:
__ smoke extension kit
__ smoke pencil

4 CHIMNEY SPILLAGE:
__ propane stove
__ butane lighter
__ timepiece
__ hand pump
__ CO tubes
__ static pressure tip

TABLE 2 : MAXIMUM ALLOWABLE DEPRESSURIZATION (MAD Limits)

APPLIANCE	IGNITION	DRAFT	TOTAL CHIMNEY HEIGHT (m)	LIMIT (Pa)
Gas-fired DHW	pilot	natural	NA	3.0
	electronic	natural	NA	3.0
	electronic	induced	NA	5.0
Oil-fired DHW	electronic	natural	NA	4.0
Gas furnace/boiler	pilot	natural	2 - 4	4.0
	pilot	natural	4 - 8	5.0
	electronic	natural	2 - 4	3.0
	electronic	natural	4 - 8	4.0
	electronic	induced	NA	6.0
	pilot	forced	NA	6.0
Oil furnace/boiler	electronic	natural	NA	4.0
	pilot	forced	NA	4.0
Fireplaces	NA	natural	NA	3.0

FIRING RATE CALCULATIONS:

Thousand BTU/hr Input = $\frac{\text{seconds req'd for dial to record 1 ft}^3}{3852}$

Percentage Overfiring = $\frac{\text{actual rate} - \text{nominal rate}}{\text{nominal rate}} \times 100$

5. MISS SARAH [illegible] ([illegible], [illegible] [illegible])

COMBUSTION VENTILATION SAFETY CHECK 1.5

Address Street Municipality Arr. time __:__ Date JAN. 29/[illegible]
McGee Drive, Kingston, Kings Co., N.S. Compl. time __:__ P.M.

1 CHIMNEY INSPECTION
~~Oil furnace connected to 7" Ø inside prefab chim~~

Results Summary
ALL OK ☑ NOT DONE ☐ MAINTENANCE RECOMMENDED ☐ MAINTENANCE REQ'D ☐
PROBLEMS (specify A1 A2, etc) ____

INSPECTION LIST: (FURNACE=A DHW=B FIREPLACE=C)

1 cap needs repair ✓
2 clearance insufficient ✓
3 supports inadequate ✓
4 ~~brickwork needs repair~~
5 top spoted or stained ✓
6 lining needs repair ✓
7 ~~lining missing (gas)~~
8 creosote excessive ✓
9 flue wrong size ✓
10 flue connector loose ✓
11 flue connector corroded ✓
12 damper imbalanced ✓
13 hood stained or rusted ✓
14 connector design problem ✓
15 fuel odours present ✓
16 blower compartment loose ✓
17 filter plugged ✓
18 burner dirty or sooted ✓
19 air supply plugged ✓
20 inlet poorly located ✓

2 FURNACE ROOM VENT/PRESSURE TEST

Results Summary
ALL OK ☐ NOT DONE ☐ N/A ☐ INITIAL FAILURE ☑
Initial Pressure: FANS 2way ___ exhaust 6.0 blower ___ FIRE sm ___ lg ___
Reduced Pressure: FANS 2way ___ exhaust 7.5 blower ___ FIRE sm ___ lg ___
Relief Measures Taken: WINDOW OPENED 50 cm X 90 cm. OR [illegible]

HUGE OPENING

CLOSE: ext doors ☑ windows ☑ int doors ☑
~~TURN OFF: furnace pilot ☐ DHW ☐ stove ☐~~
SET UP: tubing ☑ gauge ☑
CLOSE INLETS: furnace rm ☐ house ☑ ~~firepl ☐~~
CLOSE CHIMNEYS: furn ☐ DHW ☐ fpl dampers ☐
FANS OFF & COVERS REMOVED: ☑

ZERO GAUGE: ☑
OPERATE FANS: range ☑ ~~stove ☑~~
bath1 ☑ bath2 ☐ bath3 ☐ dryer ☐
vacuum special ☐
RECORD PRESSURES: fans on ☐ blower on ☐
(Fails? inlets open ☐ labels applied ☐)

PREPARE SM FPL: window open ☐ chimney open ☐
air supply open ☐ firepl doors open ☐
burner high ☐ check draft ☐ window closed ☐
CHECK FPL SPILLAGE: ☐ (Fails? close firepl OR open window ☐ apply label ☐)
RECORD PRESSURE: ☐ (Fails? close fireplace doors ☐ apply labels ☐)

3 HEAT EXCHANGER LEAKAGE TEST

Results Summary
ALL OK ☑ NOT DONE ☐ SLIGHT FAILURE ☐ MAJOR FAILURE ☐
Describe leakage: NO VISIBLE CHANGE WITH BLOWER ON OR OFF.

(GAS)
PREPARATION: pilot light off ☐ flue still plugged ☐
PREPARE EQUIPMENT: smoke ready ☐ light on ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke checks ☐
RESET FURNACE: blower off ☐ chimney open ☐ pilot lit ☐

(OIL)
PREPARATION: ensure burner off ☑ flue still plugged ☑
register open ☐ port open ☐ smoke candle & lighter ready ☐
PREPARE EQUIPMENT: smoke ready ☐ port open ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☑ top ☑
TEST LEAKAGE: blower on ☑ repeat smoke check ☑
RESET FURNACE: blower off ☐ chimney open ☐ port closed ☑

O.K

4 FURNACE ROOM SPILLAGE TEST

Results Summary
ALL OK ☑ SPILL FAILURE ☐ OVERFIRING ☐ EXCESS CO ☐ LOW DRAFT ☐
Furnace: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
DHW: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
Gas Furnace Firing Rate: actual ___ nominal ___ % overfiring ___ CO ppm ___
Gas DHW Firing Rate: actual ___ nominal ___ % overfiring ___ CO ppm ___
Oil Furnace Draft Measurement (Pascals) 7.5 O.K

ENSURE CONTINUED OPERATION: fans ☑ ~~fireplaces ☐~~
FURNACE OPERATION: open flues ☑ stand aside ☑ turn it on ☑
OBSERVE & TIME SPILLAGE: port ☐ hood ☐ damper ☑ joins ☐
RECHECK SPILLAGE AFTER BLOWER OPERATES: ☑ LESS THAN 10 SEC.
MEASURE OIL CHIMNEY DRAFT: connect static tip ☐ record draft ☐ O.K

CLOCK GAS METER: record seconds ☐ cubic feet ☐ BTU/HR ☐
RECORD FIRING RATES: actual ☐ nominal ☐ % calculation ☐
SAMPLE CO IN FLUE GAS: hand pump ☐ record ppm ☐
DHW OPERATION: turn it on ☐ recheck spillage ☐ sample CO ☐
record CO ppm ☐

5 FIREPLACE VENT/PRESSURE TEST

Results Summary
ALL OK ☐ NOT DONE ☐ INITIAL FAILURE ☐
SML: (Pa) ___; repeated with: inlets open ___, doors shut ___,
lg fpl off ___, or relief opening req'd of ___ mm X ___ mm
LGE: (Pa) ___; repeated with: inlets open ___, doors shut ___,
lg fpl off ___, or relief opening req'd of ___ mm X ___ mm

ENSURE CONT. OPERATION: fans ☐ furnace ☐ DHW ☐ lg/sm fpl ☐
RELOCATE INDOOR TUBE TO FIREPLACE ROOM: small ☐ large ☐
PREPARE SM/LG FIREPLACE: burner off ☐ air inlets open ☐
chimney damper closed ☐ fireplace doors open ☐

RECORD PRESSURE: ☐ (Fails? determine best remedial measure:
1. open any inlets to furnace rm or house ☐ passes ☐
2. close any fpl doors & relocate tubing ☐ passes ☐
3. shut off any other fpl ☐ passes ☐

COMPLETION:
ENSURE FLUES OPEN: furnace ☐ DHW ☐ stove ☐ OPEN INLETS: furnace rm ☐ house ☐ crawl sp ☐
RESET: furnace pilot ☐ /thermostat ☐ DHW valve ☐ CHECK FURNACE OPERATION: full cycle ☐ flame colour ☐
fans ☐ fireplace dampers ☐ ☐

A RECORD OF REMEDIAL ACTIONS TAKEN:

LABELS APPLIED Exhaust Fan ___ Combustion air ___ Fresh air ___ Blower ___
Sml Fireplace ___ Lge Fireplace ___ Furnace ___ DHW ___

ADVICE TO OCCUPANT Verbal Explanation __ Literature _____
Referral to _____

INLET INSTALLED Size _____ Location _____

OTHER WORK _____

FOLLOW-UP REQUIRED None __ Urgent __ Today __ Routine __ Optional ✓

(Details:) _____

TABLE 1: SUGGESTED TOOL LIST

1 INSPECTION:
__ adj. mirror
__ flash
__ ratchet
__ multi-screwdriver
__ binoculars
__ tape measure
__ fan labels
__ inlet labels
__ fireplace labels

2&5 FURNACE OR FIREPLACE ROOM TESTING:
__ manometer
__ tubing & connectors
__ 3" masking tape
__ balloons & tube

FIREPLACES:
__ propane stovetop
__ butane lighter
__ propane cannister

3 HEAT EXCHANGER:
__ smoke extension kit
__ smoke pencil

4 CHIMNEY SPILLAGE:
__ propane stove
__ butane lighter
__ timepiece
__ hand pump
__ CO tubes
__ static pressure tip

TABLE 2 : MAXIMUM ALLOWABLE DEPRESSURIZATION (MAD Limits)

APPLIANCE	IGNITION	DRAFT	TOTAL CHIMNEY HEIGHT (m)	LIMIT (Pa)
Gas-fired DHW	pilot	natural	NA	3.0
	electronic	natural	NA	3.0
	electronic	induced	NA	5.0
Oil-fired DHW	electronic	natural	NA	4.0
Gas furnace/boiler	pilot	natural	2 - 4	4.0
	pilot	natural	4 - 8	5.0
	electronic	natural	2 - 4	3.0
	electronic	natural	4 - 8	4.0
	electronic	induced	NA	6.0
	pilot	forced	NA	6.0
Oil furnace/boiler	electronic	natural	NA	4.0
	pilot	forced	NA	4.0
Fireplaces	NA	natural	NA	3.0

FIRING RATE CALCULATIONS:

Thousand BTU/hr Input = $\frac{\text{seconds req'd for dial to record 1 ft}^3}{3852}$

Percentage Overfiring = $\frac{\text{actual rate} - \text{nominal rate}}{\text{nominal rate}} \times 100$

COMBUSTION VENTILATION SAFETY CHECK

Address: Street BARTON, DIGBY CO, N.S. Municipality Arr. time __:__ Compl. time __:__ Date JAN 30/86 Attn:

1 Results Summary

CHIMNEY INSPECTION WOODSTOVE CONNECTED TO INTERIOR MASONRY CHIMNEY
ALL OK ☑ NOT DONE ☐ MAINTENANCE RECOMMENDED ☐ MAINTENANCE REQ'D ☐
PROBLEMS (specify A1 A2, etc) → HAS COIL FOR D.H.W. CONNECTED TO WOODSTOVE

INSPECTION LIST: (FURNACE=A DHW=B FIREPLACE=C)

1	cap needs repair O'K NOLAP	6	lining needs repair	11	flue connector corroded	16	~~blower compartment loose~~
2	clearance insufficient	7	~~lining missing (gas)~~	12	~~damper imbalanced~~	17	~~filter plugged~~
3	~~supports inadequate~~	8	creosote excessive	13	hood stained or rusted	18	~~burner dirty or sooted~~
4	brickwork needs repair	9	flue wrong size	14	connector design problem	19	air supply plugged
5	top sooted or stained	10	flue connector loose	15	~~fuel odours or vent~~	20	inlet poorly located

2 Results Summary

FURNACE ROOM VENT/PRESSURE TEST
ALL OK ☐ NOT DONE ☐ N/A ☐ INITIAL FAILURE ☐
Initial Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Reduced Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Relief Measures Taken: _____

CLOSE: ext doors ☐ windows ☐ int doors ☐
TURN OFF: furnace pilot ☐ DHW ☐ stove ☐
SET UP: tubing ☐ gauge ☐
CLOSE INLETS: furnace rm ☐ house ☐ firepl ☐
CLOSE CHIMNEYS: furn ☐ DHW ☐ fpl dampers ☐
FANS OFF & COVERS REMOVED: ☐

ZERO GAUGE: ☐
OPERATE FANS: range ☐ stovetop ☐ bath1 ☐ bath2 ☐ bath3 ☐ dryer ☐ vacuum ☐ special ☐
RECORD PRESSURES: fans on ☑ blower on ☐ (Fails? inlets open ☐ labels applied ☐)

PREPARE SM FPL: window open ☐ chimney open ☐ air supply open ☐ firepl doors open ☐ burner high ☐ check draft ☐ window closed ☐
CHECK FPL SPILLAGE: ☐ (Fails? close firepl OR open window ☐ apply label ☐)
RECORD PRESSURE: ☐ (Fails? close fireplace doors ☐ apply labels ☐)

3 Results Summary

HEAT EXCHANGER LEAKAGE TEST
ALL OK ☐ NOT DONE ☐ SLIGHT FAILURE ☐ MAJOR FAILURE ☐
Describe leakage: _____

(GAS)
PREPARATION: pilot light off ☐ flue still plugged ☐
PREPARE EQUIPMENT: smoke ready ☐ light on ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke checks ☐
RESET FURNACE: blower off ☐ chimney open ☐ pilot lit ☐

(OIL)
PREPARATION: ensure burner off ☐ flue still plugged ☐ register open ☐ port open ☐ smoke candle & lighter ready ☐
PREPARE EQUIPMENT: smoke ready ☐ port open ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke check ☐
RESET FURNACE: blower off ☐ chimney open ☐ port closed ☐

4 Results Summary

FURNACE ROOM SPILLAGE TEST
ALL OK ☐ SPILL FAILURE ☐ OVERFIRING ☐ EXCESS CO ☐ LOW DRAFT ☐
Furnace: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
DHW: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
Gas Furnace Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Gas DHW Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Oil Furnace Draft Measurement (Pascals) ____

ENSURE CONTINUED OPERATION: fans ☐ fireplaces ☐☐
FURNACE OPERATION: open flues ☐ stand aside ☐ turn it on ☐
OBSERVE & TIME SPILLAGE: port ☐ hood ☐ damper ☐ joins ☐
RECHECK SPILLAGE AFTER BLOWER OPERATES: ☐
MEASURE OIL CHIMNEY DRAFT: connect static tip ☐ record draft ☐

CLOCK GAS METER: record seconds ☐ cubic feet ☐ BTU/HR ☐
RECORD FIRING RATES: actual ☐ nominal ☐ % calculation ☐
SAMPLE CO IN FLUE GAS: hand pump ☐ record ppm ☐
DHW OPERATION: turn it on ☐ recheck spillage ☐ sample CO ☐ record CO ppm ☐

5 Results Summary

FIREPLACE VENT/PRESSURE TEST
ALL OK ☑ NOT DONE ☐ INITIAL FAILURE ☑
SML: (Pa) 3.5; repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of 50 mm x 900 mm
LGE: (Pa) ___; repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of _____mm x_____mm

ENSURE CONT. OPERATION: fans ☐ furnace ☐ DHW ☐ lg/sm fpl ☐
RELOCATE INDOOR TUBE TO FIREPLACE ROOM: small ☐ large ☐
PREPARE SM/LG FIREPLACE: burner off ☐ air inlets open ☐ chimney damper closed ☐ fireplace doors open ☐

RECORD PRESSURE: ☐ (Fails? determine best remedial measure:
1. open any inlets to furnace rm or house ☐ passes ☐
2. close any fpl doors & relocate tubing ☐ passes ☐ ✓
3. shut off any other fpl ☐ passes ☐

COMPLETION:
ENSURE FLUES OPEN: furnace ☐ DHW ☐ stove ☐ OPEN INLETS: furnace rm ☐ house ☐ crawl sp ☐
RESET: furnace pilot ☐/thermostat ☐ DHW valve ☐ CHECK FURNACE OPERATION: full cycle ☐ flame colour ☐
fans ☐ fireplace dampers ☐ ☐

A RECORD OF REMEDIAL ACTIONS TAKEN:

LABELS APPLIED Exhaust Fan ___ Combustion air ___ Fresh air___ Blower__
Sml Fireplace___ Lge Fireplace___ Furnace ___ DHW ___
ADVICE TO OCCUPANT Verbal Explanation __ Literature _____
Referral to _____
INLET INSTALLED Size _____ Location _____
OTHER WORK
FOLLOW-UP REQUIRED None__ Urgent__ Today__ Routine__ Optional__
(Details:) _____

TABLE 1: SUGGESTED TOOL LIST

1 INSPECTION:
__ adj. mirror
__ flash
__ ratchet
__ multi-screwdriver
__ binoculars
__ tape measure
__ fan labels
__ inlet labels
__ fireplace labels

2&3 FURNACE OR FIREPLACE ROOM TESTING:
__ manometer
__ tubing & connectors
__ 3" masking tape
__ balloons & tube

FIREPLACES:
__ propane stovetop
__ butane lighter
__ propane cannister

3 HEAT EXCHANGER:
__ smoke extension
__ smoke pencil

4 CHIMNEY SPILLAGE:
__ propane stove
__ butane lighter
__ timepiece
__ hand pump
__ CO tubes
__ static pressure t

TABLE 2 : MAXIMUM ALLOWABLE DEPRESSURIZATION (MAD Limits)

APPLIANCE	IGNITION	DRAFT	TOTAL CHIMNEY HEIGHT (m)	LIMIT (Pa)
Gas-fired DHW	pilot	natural	NA	3.0
	electronic	natural	NA	3.0
	electronic	induced	NA	5.0
Oil-fired DHW	electronic	natural	NA	4.0
Gas furnace/boiler	pilot	natural	2 - 4	4.0
	pilot	natural	4 - 8	5.0
	electronic	natural	2 - 4	4.0
	electronic	natural	4 - 8	4.0
	electronic	induced	NA	6.0
	pilot	forced	NA	6.0
Oil furnace/boiler	electronic	natural	NA	4.0
	pilot	forced	NA	4.0
Fireplaces	NA	natural	NA	3.0

FIRING RATE CALCULATIONS:

Thousand BTU/hr Input = $\frac{\text{seconds req'd for dial to record 1 ft}^3}{3852}$

Percentage Overfiring = $\frac{\text{actual rate} - \text{nominal rate}}{\text{nominal rate}} \times 100$

COMBUSTION VENTILATION SAFETY CHECK

Address Street, Municipality — Arr. time __:__ Date JAN. 30/8
BARTON, DIGBY CO, N.S — Compl. time __:__

1 Results Summary — CHIMNEY INSPECTION

WOODSTOVE CONNECTED TO OUTDOOR MASONRY CHIMNEY

ALL OK ☐ NOT DONE ☐ MAINTENANCE RECOMMENDED ☑ MAINTENANCE REQ'D ☐

PROBLEMS (specify A1, A2, etc.) C-14
STOVEPIPE CLEARANCE TO WALL (INSUFFICIENT)

INSPECTION LIST: (FURNACE=A DHW=B FIREPLACE=C)

1	cap needs repair NO CAP O/A	6	lining needs repair ✓	11	flue connector corroded ✓	16	~~blower compartment loose~~
2	clearance insufficient ✓	7	~~lining missing (gas)~~	12	~~damper imbalanced~~	17	~~filter plugged~~
3	supports inadequate ✓	8	creosote excessive ✓	13	~~heat stained or rusted~~	18	~~burner dirty or sooted~~
4	brickwork needs repair ✓	9	flue wrong size ✓	14	connector design problem	19	air supply plugged ✓
5	top sooted or stained ✓	10	flue connector loose ✓	15	~~fuel odours present~~	20	inlet poorly located ✓

2 Results Summary — FURNACE ROOM VENT/PRESSURE TEST

ALL OK ☐ NOT DONE ☐ N/A ☐ INITIAL FAILURE ☐

Initial Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Reduced Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Relief Measures Taken: ___

CLOSE: ext doors ☐ windows ☐ int doors ☐
TURN OFF: furnace pilot ☐ DHW ☐ stove ☐
SET UP: tubing ☐ gauge ☐
CLOSE INLETS: furnace rm ☐ house ☐ fireplace ☐
CLOSE CHIMNEYS: furn ☐ DHW ☐ fpl dampers ☐
FANS OFF & COVERS REMOVED: ☐

ZERO GAUGE: ☐
OPERATE FANS: range ☐ stovetop ☐ bath1 ☐ bath2 ☐ bath3 ☐ dryer ☐ vacuum ☐ special ☐
RECORD PRESSURES: fans on ☐ blower on ☐ (Fails? inlets open ☐ labels applied ☐)

PREPARE SM FPL: window open ☐ chimney open ☐ air supply open ☐ firepl doors open ☐ burner high ☐ check draft ☐ window closed ☐
CHECK FPL SPILLAGE: ☐ (Fails: close firepl doors ☐ OR open window ☐ apply label ☐)
RECORD PRESSURE: ☐ (Fails? close fireplace doors ☐ apply labels ☐)

3 Results Summary — HEAT EXCHANGER LEAKAGE TEST

ALL OK ☐ NOT DONE ☐ SLIGHT FAILURE ☐ MAJOR FAILURE ☐

Describe leakage: ___

(GAS)
PREPARATION: pilot light off ☐ flue still plugged ☐
PREPARE EQUIPMENT: smoke ready ☐ light on ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke checks ☐
RESET FURNACE: blower off ☐ chimney open ☐ pilot lit ☐

(OIL)
PREPARATION: ensure burner off ☐ flue still plugged ☐ register open ☐ port open ☐ smoke candle & lighter ready ☐
PREPARE EQUIPMENT: smoke ready ☐ port open ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke check ☐
RESET FURNACE: blower off ☐ chimney open ☐ port closed ☐

4 Results Summary — FURNACE ROOM SPILLAGE TEST

ALL OK ☐ SPILL FAILURE ☐ OVERFIRING ☐ EXCESS CO ☐ LOW DRAFT ☐

Furnace: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
DHW: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
Gas Furnace Firing Rate: actual___ nominal___ % overfiring ___ CO ppm
Gas DHW Firing Rate: actual___ nominal___ % overfiring ___ CO ppm
Oil Furnace Draft Measurement (Pascals) ___

ENSURE CONTINUED OPERATION: fans ☐ fireplaces ☐☐
FURNACE OPERATION: open flues ☐ stand aside ☐ turn it on ☐
OBSERVE & TIME SPILLAGE: port ☐ hood ☐ damper ☐ coins ☐
RECHECK SPILLAGE AFTER BLOWER OPERATES: ☐
MEASURE OIL CHIMNEY DRAFT: connect static tip ☐ record draft ☐

CLOCK GAS METER: record seconds ☐ cubic feet ☐ BTU/HR ☐
RECORD FIRING RATES: actual ☐ nominal ☐ % calculation ☐
SAMPLE CO IN FLUE GAS: hand pump ☐ record ppm ☐
DHW OPERATION: turn it on ☐ recheck spillage ☐ sample CO ☐ record CO ppm ☐

5 Results Summary — FIREPLACE VENT/PRESSURE TEST

ALL OK ☑ NOT DONE ☐ INITIAL FAILURE ☑

SML: (Pa) 2.5; repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of ___mm x ___mm
LGE: (Pa) ___; repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of ___mm x ___mm

ENSURE CONT. OPERATION: fans ☐ furnace ☐ DHW ☐ lg/sm fpl ☐
RELOCATE INDOOR TUBE TO FIREPLACE ROOM: small ☐ large ☐
PREPARE SM/LG FIREPLACE: burner off ☐ air inlets open ☐ chimney damper closed ☐ fireplace doors open ☐

RECORD PRESSURE: ☐ (Fails? determine best remedial measure:
1. open any inlets to furnace rm or house ☐ passes ☐
2. close any fpl doors & relocate tubing ☐ passes ☐
3. shut off any other fpl ☐ passes ☐

COMPLETION:
ENSURE FLUES OPEN: furnace ☐ DHW ☐ stove ☐ OPEN INLETS: furnace rm ☐ house ☐ crawl sp ☐
RESET: furnace pilot ☐/thermostat ☐ DHW valve ☐ CHECK FURNACE OPERATION: full cycle ☐ flame colour ☐
fans ☐ fireplace dampers ☐ ☐

A RECORD OF REMEDIAL ACTIONS TAKEN:

LABELS APPLIED Exhaust Fan ___ Combustion air ___ Fresh air ___ Blower ___
Sml Fireplace ___ Lge Fireplace ___ Furnace ___ DHW ___

ADVICE TO OCCUPANT Verbal Explanation __ Literature _____
Referral to _____

INLET INSTALLED Size _____ Location _____

OTHER WORK

FOLLOW-UP REQUIRED None __ Urgent __ Today __ Routine __ Optional __
(Details:) _____

TABLE 1: SUGGESTED TOOL LIST

1 INSPECTION:
-- adj. mirror
-- flash
-- ratchet
-- multi-screwdriver
-- binoculars
-- tape measure
-- fan labels
-- inlet labels
-- fireplace labels

2&3 FURNACE OR FIREPLACE ROOM TESTING:
-- manometer
-- tubing & connectors
-- 3" masking tape
-- balloons & tube

FIREPLACES:
-- propane stovetop
-- butane lighter
-- propane cannister

3 HEAT EXCHANGER:
-- smoke extension kit
-- smoke pencil

4 CHIMNEY SPILLAGE:
-- propane stove
-- butane lighter
-- timepiece
-- hand pump
-- CO tubes
-- static pressure ti

TABLE 2 : MAXIMUM ALLOWABLE DEPRESSURIZATION (MAD Limits)

APPLIANCE	IGNITION	DRAFT	TOTAL CHIMNEY HEIGHT (m)	LIMIT (Pa)
Gas-fired DHW	pilot	natural	NA	3.0
	electronic	natural	NA	3.0
	electronic	induced	NA	5.0
Oil-fired DHW	electronic	natural	NA	4.0
Gas furnace/boiler	pilot	natural	2 - 4	4.0
	pilot	natural	4 - 8	5.0
	electronic	natural	2 - 4	3.0
	electronic	natural	4 - 8	4.0
	electronic	induced	NA	6.0
	pilot	forced	NA	6.0
Oil furnace/boiler	electronic	natural	NA	4.0
	pilot	forced	NA	4.0
Fireplaces	NA	natural	NA	3.0

FIRING RATE CALCULATIONS:

Thousand BTU/hr Input = $\frac{\text{seconds req'd for dial to record 1 ft}^3}{3352}$

Percentage Overfiring = $\frac{\text{actual rate} - \text{nominal rate}}{\text{nominal rate}} \times 100$

COMBUSTION VENTILATION SAFETY CHECK 1..

Address Street Municipality — Arr. time __:__ Date JAN. 30/8
BARTON, DIGBY CO, N.S. — Compl. time __:__ P.M.

CHIMNEY INSPECTION WOODSTOVE CONNECTED TO OUTDOOR MASONRY CHIMNEY

1 Results Summary

ALL OK ☑ NOT DONE ☐ MAINTENANCE RECOMMENDED ☑ MAINTENANCE REQ'D ☐

PROBLEMS (specify A1 A2, etc) C-14 STOVEPIPE CLEARANCE TO WALL INSUFFICIENT

O.K

INSPECTION LIST: (FURNACE=A DHW=B FIREPLACE=C)

1	cap needs repair	NO CAP	6	lining needs repair	✓	11	flue connector corroded	✓	16	~~blower compartment loose~~
2	clearance insufficient	✓	7	~~lining missing (gas)~~		12	~~damper imbalanced~~		17	~~filter plugged~~
3	supports inadequate	✓	8	creosote excessive	✓	13	hood stained or rusted	✓	18	~~burner dirty or sooted~~
4	brickwork needs repair	✓	9	flue wrong size	✓	14	Connector design problem		19	air supply plugged	✓
5	top sooted or stained	✓	10	flue connector loose	✓	15	~~fuel burning appliance~~		20	inlet poorly located	✓

2 Results Summary

FURNACE ROOM VENT/PRESSURE TEST

ALL OK ☐ NOT DONE ☐ N/A ☐ INITIAL FAILURE ☐

Initial Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___

Reduced Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___

Relief Measures Taken: _____

CLOSE: ext doors ☐ windows ☐ int doors ☐
TURN OFF: furnace pilot ☐ DHW ☐ stove ☐
SET UP: tubing ☐ gauge ☐
CLOSE INLETS: furnace rm ☐ house ☐ firepl ☐
CLOSE CHIMNEYS: furn ☐ DHW ☐ fpl dampers ☐
FANS OFF & COVERS REMOVED: ☐

ZERO GAUGE ☐
OPERATE FANS: range ☐ stovetop ☐ bath1 ☐ bath2 ☐ bath3 ☐ dryer ☐ vacuum ☐ special ☐
RECORD PRESSURES: fans on ☐ blower on ☐ (Fails? inlets open ☐ labels applied ☐)

PREPARE SM FPL: window open ☐ chimney open ☐ air supply open ☐ firepl doors open ☐ burner high ☐ check draft ☐ window closed
CHECK FPL SPILLAGE: ☐ (Fails? close firepl OR open window ☐ apply label ☐)
RECORD PRESSURE: ☐ (Fails? close fireplace doors ☐ apply labels ☐)

3 Results Summary

HEAT EXCHANGER LEAKAGE TEST

ALL OK ☐ NOT DONE ☐ SLIGHT FAILURE ☐ MAJOR FAILURE ☐

Describe leakage: _____

(GAS)

PREPARATION: pilot light off ☐ flue still plugged ☐
PREPARE EQUIPMENT: smoke ready ☐ light on ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke checks ☐
RESET FURNACE: blower off ☐ chimney open ☐ pilot lit ☐

(OIL)

PREPARATION: ensure burner off ☐ flue still plugged ☐ register open ☐ port open ☐ smoke candle & lighter ready ☐
PREPARE EQUIPMENT: smoke ready ☐ port open ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke check ☐
RESET FURNACE: blower off ☐ chimney open ☐ port closed ☐

4 Results Summary

FURNACE ROOM SPILLAGE TEST

ALL OK ☐ SPILL FAILURE ☐ OVERFIRING ☐ EXCESS CO ☐ LOW DRAFT ☐

Furnace: none ☐ temporary (sec)___ continuous ☐; slight ☐ major ☐
DHW: none ☐ temporary (sec)___ continuous ☐; slight ☐ major ☐

Gas Furnace Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Gas DHW Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Oil Furnace Draft Measurement (Pascals) _____

ENSURE CONTINUED OPERATION: fans ☐ fireplaces ☐☐
FURNACE OPERATION: open flues ☐ stand aside ☐ turn it on ☐
OBSERVE & TIME SPILLAGE: port ☐ hood ☐ damper ☐ joint ☐
RECHECK SPILLAGE AFTER BLOWER OPERATES: ☐
MEASURE OIL CHIMNEY DRAFT: connect static tip ☐ record draft ☐

CLOCK GAS METER: record seconds ☐ cubic feet ☐ BTU/HR ☐
RECORD FIRING RATES: actual ☐ nominal ☐ % calculation ☐
SAMPLE CO IN FLUE GAS: hand pump ☐ record ppm ☐
DHW OPERATION: turn it on ☐ recheck spillage ☐ sample CO ☐ record CO ppm ☐

5 Results Summary

FIREPLACE VENT/PRESSURE TEST

ALL OK ☐ NOT DONE ☐ INITIAL FAILURE ☑

SML: (Pa) 45; repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of 50 mm x 400 mm
LGE: (Pa)___; repeated with: inlets open___, doors shut___, lg fpl off___, or relief opening req'd of _____mm x _____mm

ENSURE CONT. OPERATION: fans ☐ furnace ☐ DHW ☐ lg/sm fpl ☐
RELOCATE INDOOR TUBE TO FIREPLACE ROOM: small ☐ large ☐
PREPARE SM/LG FIREPLACE: burner off ☐ air inlets open ☐ chimney damper closed ☐ fireplace doors open ☐

RECORD PRESSURE: ☐ (Fails? determine best remedial measure:
1. open any inlets to furnace rm or house ☐ passes ☐
2. close any fpl doors & relocate tubing ☐ passes ☐
3. shut off any other fpl ☐ passes ☐

COMPLETION:
ENSURE FLUES OPEN: furnace ☐ DHW ☐ stove ☐ OPEN INLETS: furnace rm ☐ house ☐ crawl sp ☐
RESET: furnace pilot ☐/thermostat ☐ DHW valve ☐ CHECK FURNACE OPERATION: full cycle ☐ flame colour ☐ fans ☐ fireplace dampers ☐ ☐

A RECORD OF REMEDIAL ACTIONS TAKEN:

LABELS APPLIED — Exhaust Fan ___ Combustion air ___ Fresh air ___ Blower ___
Sml Fireplace ___ Lge Fireplace ___ Furnace ___ DHW ___

ADVICE TO OCCUPANT — Verbal Explanation __ Literature _____
Referral to _____

INLET INSTALLED — Size _____ Location _____

OTHER WORK _____

FOLLOW-UP REQUIRED — None __ Urgent __ Today __ Routine __ Optional __
(Details:) _____

TABLE 1: SUGGESTED TOOL LIST

1 INSPECTION:
__ adj. mirror
__ flash
__ ratchet
__ multi-screwdriver
__ binoculars
__ tape measure
__ fan labels
__ inlet labels
__ fireplace labels

2&5 FURNACE OR FIREPLACE ROOM TESTING:
__ manometer
__ tubing & connectors
__ 3" masking tape
__ balloons & tube

FIREPLACES:
__ propane stovetop
__ butane lighter
__ propane cannister

3 HEAT EXCHANGER:
__ smoke extension kit
__ smoke pencil

4 CHIMNEY SPILLAGE:
__ propane stove
__ butane lighter
__ timepiece
__ hand pump
__ CO tubes
__ static pressure tip

TABLE 2 : MAXIMUM ALLOWABLE DEPRESSURIZATION (MAD Limits)

APPLIANCE	IGNITION	DRAFT	TOTAL CHIMNEY HEIGHT (m)	LIMIT (Pa)
Gas-fired DHW	pilot	natural	NA	3.0
	electronic	natural	NA	3.0
	electronic	induced	NA	5.0
Oil-fired DHW	electronic	natural	NA	4.0
Gas furnace/boiler	pilot	natural	2 - 4	4.0
	pilot	natural	4 - 8	5.0
	electronic	natural	2 - 4	3.0
	electronic	natural	4 - 8	4.0
	electronic	induced	NA	6.0
	pilot	forced	NA	6.0
Oil furnace/boiler	electronic	natural	NA	4.0
	pilot	forced	NA	4.0
Fireplaces	NA	natural	NA	3.0

FIRING RATE CALCULATIONS:

Thousand BTU/hr Input = $\frac{\text{seconds req'd for dial to record 1 ft}^3}{3352}$

Percentage Overfiring = $\frac{\text{actual rate} - \text{nominal rate}}{\text{nominal rate}} \times 100$

COMBUSTION VENTILATION SAFETY CHECK 1.1

Address Street / Municipality: TIVERTON, DIGBY CO, NOS. | Arr. time __:__ | Date: JAN. 31/86
Compl. time __:__

1 CHIMNEY INSPECTION (WOODSTOVE CONNECTED TO INSIDE MASONRY CHIMNEY)

Results Summary: ALL OK ☐ NOT DONE ☐ MAINTENANCE RECOMMENDED ☐ MAINTENANCE REC'D ☐
PROBLEMS (specify A1 A2, etc) _____

INSPECTION LIST: (FURNACE=A DHW=B FIREPLACE=C)

1	cap needs repair NO CAP ✓	6	lining needs repair ✓	11	flue connector corroded ✓	16	~~blower compartment loose~~
2	clearance insufficient ✓	7	~~lining missing (gyt)~~	12	damper imbalanced ✓	17	~~filter plugged~~
3	supports inadequate ✓	8	creosote excessive ✓	13	hood stained or rusted ✓	18	~~burner dirty or sooted~~
4	brickwork needs repair ✓	9	flue wrong size ✓	14	connector design problem ✓	19	air supply plugged ✓
5	top sooted or stained ✓	10	flue connector loose ✓	15	~~fuel odours present~~ ✓	20	inlet poorly located

2 FURNACE ROOM VENT/PRESSURE TEST

Results Summary: ALL OK ☐ NOT DONE ☐ N/A ☐ INITIAL FAILURE ☐
Initial Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Reduced Pressure: FANS 2way___ exhaust___ blower___ FIRE sm___ lg___
Relief Measures Taken: _____

CLOSE: ext doors ☐ windows ☐ int doors ☐
TURN OFF: furnace pilot ☐ DHW ☐ stove ☐
SET UP: tubing ☐ gauge ☐
CLOSE INLETS: furnace rm ☐ house ☐ firepl ☐
CLOSE CHIMNEYS: furn ☐ DHW ☐ fpl dampers ☐
FANS OFF & COVERS REMOVED: ☐

ZERO GAUGE: ☐
OPERATE FANS: range ☐ stovetop ☐
bath1 ☐ bath2 ☐ bath3 ☐ dryer ☐
vacuum ☐ special ☐
RECORD PRESSURES: fans on ☑ blower on ☐
(Fails? inlets open ☐ labels applied ☐)

PREPARE SM FPL: window open ☐ chimney open ☐
air supply open ☐ firepl doors open ☐
burner high ☐ check draft ☐ window closed ☐
CHECK FPL SPILLAGE: ☐ (Fails: close firepl OR open window ☐ apply label ☐)
RECORD PRESSURE: ☐ (Fails? close fireplace doors ☐ apply labels ☐)

3 HEAT EXCHANGER LEAKAGE TEST

Results Summary: ALL OK ☐ NOT DONE ☐ SLIGHT FAILURE ☐ MAJOR FAILURE ☐
Describe leakage: _____

(GAS)
PREPARATION: pilot light off ☐ flue still plugged ☐
PREPARE EQUIPMENT: smoke ready ☐ light on ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke checks ☐
RESET FURNACE: blower off ☐ chimney open ☐ pilot lit ☐

(OIL)
PREPARATION: ensure burner off ☐ flue still plugged ☐
register open ☐ port open ☐ smoke candle & lighter ready ☐
PREPARE EQUIPMENT: smoke ready ☐ port open ☐
SMOKE CHECK PORTS WITH BLOWER OFF: bottom ☐ top ☐
TEST LEAKAGE: blower on ☐ repeat smoke check ☐
RESET FURNACE: blower off ☐ chimney open ☐ port closed ☐

4 FURNACE ROOM SPILLAGE TEST

Results Summary: ALL OK ☐ SPILL FAILURE ☐ OVERFIRING ☐ EXCESS CO ☐ LOW DRAFT ☐
Furnace: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
DHW: none ☐ temporary (sec) ___ continuous ☐; slight ☐ major ☐
Gas Furnace Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Gas DHW Firing Rate: actual_____ nominal_____ % overfiring _____ CO ppm___
Oil Furnace Draft Measurement (Pascals) ____

ENSURE CONTINUED OPERATION: fans ☐ fireplaces ☐☐
FURNACE OPERATION: open flues ☐ stand aside ☐ turn it on ☐
OBSERVE & TIME SPILLAGE: port ☐ hood ☐ damper ☐ joins ☐
RECHECK SPILLAGE AFTER BLOWER OPERATES: ☐
MEASURE OIL CHIMNEY DRAFT: connect static tip ☐ record draft ☐

CLOCK GAS METER: record seconds ☐ cubic feet ☐ BTU/HR ☐
RECORD FIRING RATES: actual ☐ nominal ☐ % calculation ☐
SAMPLE CO IN FLUE GAS: hand pump ☐ record ppm ☐
DHW OPERATION: turn it on ☐ recheck spillage ☐ sample CO ☐
record CO ppm ☐

5 FIREPLACE VENT/PRESSURE TEST

Results Summary: ALL OK ☐ NOT DONE ☐ INITIAL FAILURE ☑ WOODSTOVE
SML: (Pa) 4 PA repeated with: inlets open___, doors shut___,
lg fpl off___, or relief opening req'd of _____mm x_____mm
LGE: (Pa)___; repeated with: inlets open___, doors shut___,
lg fpl off___, or relief opening req'd of 50 mm x 900 mm ✓

ENSURE CONT. OPERATION: fans ☐ furnace ☐ DHW ☐ lg/sm fpl ☐
RELOCATE INDOOR TUBE TO FIREPLACE ROOM: small ☐ large ☐
PREPARE SM/LG FIREPLACE: burner off ☐ air inlets open ☐
chimney damper closed ☐ fireplace doors open ☐

RECORD PRESSURE: ☐ (Fails? determine best remedial measure:
1. close any inlets to furnace rm or house ☐ passes ☐
2. close any fpl doors & relocate tubing ☐ passes ☐
3. shut off any other fpl ☐ passes ☐

COMPLETION:
ENSURE FLUES OPEN: furnace ☐ DHW ☐ stove ☐ OPEN INLETS: furnace rm ☐ house ☐ crawl sp ☐
RESET: furnace pilot ☐/thermostat ☐ DHW valve ☐ CHECK FURNACE OPERATION: full cycle ☐ flame colour ☐
fans ☐ fireplace dampers ☐ ☐

A RECORD OF REMEDIAL ACTIONS TAKEN:

LABELS APPLIED — Exhaust Fan ___ Combustion air ___ Fresh air ___ Blower ___ Sml Fireplace ___ Lge Fireplace ___ Furnace ___ DHW ___

ADVICE TO OCCUPANT — Verbal Explanation __ Literature _____ Referral to _____

INLET INSTALLED — Size _____ Location _____

OTHER WORK FOLLOW-UP REQUIRED (Details:) — None__ Urgent__ Today__ Routine__ Optional__

TABLE 1: SUGGESTED TOOL LIST

1 INSPECTION:
__ adj. mirror
__ flash
__ ratchet
__ multi-screwdriver
__ binoculars
__ tape measure
__ fan labels
__ inlet labels
__ fireplace labels

2&5 FURNACE OR FIREPLACE ROOM TESTING:
__ manometer
__ tubing & connectors
__ 3" masking tape
__ balloon & tube

FIREPLACES:
__ propane stovetop
__ butane lighter
__ propane cannister

3 HEAT EXCHANGER:
__ smoke extension kit
__ smoke pencil

4 CHIMNEY SPILLAGE:
__ propane stove
__ butane lighter
__ timepiece
__ hand pump
__ CO tubes
__ static pressure tip

TABLE 2 : MAXIMUM ALLOWABLE DEPRESSURIZATION (MAD Limits)

APPLIANCE	IGNITION	DRAFT	TOTAL CHIMNEY HEIGHT (m)	LIMIT (Pa)
Gas-fired DHW	pilot	natural	NA	3.0
	electronic	natural	NA	3.0
	electronic	induced	NA	5.0
Oil-fired DHW	electronic	natural	NA	4.0
Gas furnace/boiler	pilot	natural	2 - 4	4.0
	pilot	natural	4 - 8	5.0
	electronic	natural	2 - 4	3.0
	electronic	natural	4 - 8	4.0
	electronic	induced	NA	6.0
	pilot	forced	NA	6.0
Oil furnace/boiler	electronic	natural	NA	4.0
	pilot	forced	NA	4.0
Fireplaces	NA	natural	NA	3.0

FIRING RATE CALCULATIONS:

Thousand BTU/hr Input = $\frac{\text{seconds req'd for dial to record 1 ft}^3}{3352}$

Percentage Overfiring = $\frac{\text{actual rate} - \text{nominal rate}}{\text{nominal rate}} \times 100$