RESEARCH REPORT

Field Testing of House Characteristics Appendices

Canada

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FIELD TESTING OF HOUSE CHARACTERISTICS

APPENDICES

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DISCLAIMER

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APPENDIX A: Detailed Descriptions of Test Methods

House Airtightness Test

- As per CAN/CGSB 149.10-M86 Determination of the Airtightness of the Building Envelope by the Fan Depressurization Method.

- Seal flues and intentional openings so the tests can be compared to other research project results.

- Note any deviations from the standard when conditions prevent usual procedure to be followed.

Temperatures & RH

- Temperatures and RH shall be measured in the middle of each house level (3 feet above floor) away from influences of door opening as early as possible upon entering the house to reflect normal conditions with the least disruptions to these conditions.

- Record central thermostat setting and temperature indicated on thermostat.

- Record the temperature at the thermostat with the same thermometer that the temperature readings will be taken with. **Note: If there are houses with zoned heating system and multiple thermostat record other thermostat temps etc. and reference to room readings closest to zone thermostat. This condition is very unlikely to be found in houses with forced air heating systems. However, it is possible that supplemental heating by baseboard electric heaters may be present in some parts of the house or basement and will have an effect on the room temperatures independently from the central heating thermostat settings.)**

- In a bungalow, readings can be taken at both ends of the main floor.

- Sling psychrometer or electronic temperature and RH device can be used for these measurements.

- Note:
  If furnace was on during the readings - just started, just stopped, stopped or started during the time that the readings were being taken, do not repeat temperature & RH when the furnace operation changes occur, just note conditions at the time the readings were taken.

- Take additional temperatures and RH readings in any location perceived to be problematic by homeowner in addition to central location described above.

Combustion Safety Check

Note: This test is to be done after the Airtightness Test and intentional openings have been unsealed or before the openings are sealed for the Airtightness Test (ATT).

- With the ATT equipment still in place and with the fan opening sealed, record the ΔP on the house pressure manometer.

- Turn all exhaust fans and exhausting equipment ON,
  - · kitchen exhaust fans, range hoods and barbecue stove top grill fans
  - · bathroom exhaust fans
  - · HRV exhaust only defrost mode if applicable and possible to induce into that mode
  - · clothes dryer if exhausted to exterior
  - · exhaust only humidistat controlled fans or other exhaust fans

- Close doors to rooms with no exhausting equipment in them.

- Record the ΔP on the house pressure manometer

- Proceed to light propane burners in the fireplaces and wood stoves and measure new ΔP.

- Record the ΔP on the house pressure manometer

- Turn OFF all exhausting equipment started, propane burners in the fireplaces and wood stoves, water heaters and reset furnace thermostat to its normal setting.

If ΔP over 5 Pa, determine biggest exhauster and what ΔP that creates by turning it off.

Wall Temperatures

- Wall temperatures on the centre of each wall, on each level, is to be taken in the centre of the wall, away from heat registers.

- Contact thermometer to be used.

- Temperature 4.5' above floor to clear fire separation in the stud cavity. Tap on wall to locate studs. Take reading in the middle of the stud space if possible.

- Record room air temperature in the centre of the room.

- In moisture troubled houses, take readings on mouldy spots, if present. Describe the location, and possible reason for the localized problem (thermal bridging, lack of air circulation etc.).

Can be done when going around the house to do the room air temperature & RH.

Wood Moisture Reading

A wood moisture reading is to be taken on an unpainted exposed wood framing member of the structure. Relative humidity is to be taken near the wood moisture reading to correlate the two readings.

- Best location is likely in the basement (central wood beam, joist, partition stud etc.
- Readings should be taken of the main floor structure/basement ceiling or top of partitions to eliminate effects of moisture absorption from contact with concrete etc.
- Record location where readings are taken.
- If there are obvious moisture troubled spots anywhere in the house, additional wood moisture readings should be taken at those locations.
- Where the wood moisture reading is taken and the surface temperature is lower than the room air (sill plates, on an exterior wall etc.) surface contact temperature must be taken to correct the wood moisture reading.
- Only one wood moisture reading is required if there is no moisture troubled spots in the house. The purpose of this reading is only to determine if a wood moisture reading can be a good indicator of long term indoor room air RH.

NPP

- If upon entering the house, the furnace is off and flue cool, proceed to turn thermostat down to prevent furnace from starting and determine NPP furnace off with smoke pencil at any opening available (windows, doors, etc.) Check on more than one side of house (windward, leeward) if windy (10 km+). **General location of NPP is what is to be determined, not a precise location based on pressure measurements.**

- Write down NPP location relative to a height from a floor and storey. Furnace and fan off. Use only 1/2 floor height increments e.g., first floor, 1/2 height first floor, second floor 1/2 height 2nd floor, etc.

- If too gusty, record exterior conditions and comment on reliability of data acquired. Homeowner recollection of telltales of the NPP will be more relevant in some cases due to the exterior conditions at the time of testing.

- May proceed with the furnace thermostat calibration at this time as well.

- Ask homeowner if they recall if any windows freeze-up in between the inner and outer panes. Expected sign of exfiltration usually on upper floor and clear windows on main floor in two storey houses. This was suggested by Don Fugler as sufficient to determine the NPP in general. This may not be recalled by the homeowner. Could not be evident if house is really leaky and NPP is above the any windows (bungalow or very leaky two storey house) or in very dry houses (due to leakiness?). Another instance where this may not be evident is if all windows are sealed double glazing units, fixed an casements for example.

Thermostat Check

The purpose of this exercise is to determine the variations from house to house between the thermostat set-points at which the furnace starts and turns off. The duration of the furnace ON cycle varies accordingly and a wide range of variations has been observed in another project. Large differences in the efficiency of the heating systems are related to this problem.

- Set the thermostat at the setting that the home owner uses the majority of the time. If the furnace starts due to your setting the thermostat, wait for the next furnace ON cycle to proceed with this test.
- Place a thermometer at the thermostat.
- When the furnace burner starts record the time or start a stop watch.
- Record the actual temperature indicated on the thermometer at the thermostat and the temperature indicated by the thermostat thermometer when the furnace started.
- When the furnace burner stops, record the time or stop the stop watch and record the duration of the furnace cycle.
- Record the actual temperature indicated on the thermometer at the thermostat and the temperature indicated by the thermostat thermometer when the furnace stopped.
- Record capacity of furnace burner - oversized furnaces will tend to be on for shorter cycles regardless of thermostat set points and accuracy.

Room Pressurization Test updated Jan 11, 1993

This test is to determine if the furnace fan pressurizes any rooms when the door is closed (bedrooms, bathrooms, basements and mostly but could be other rooms in some houses where doors could also be kept closed most of the time).

- Close all doors to rooms that are to be tested.
- Turn the furnace fan ON or adjust the thermostat to start the furnace.
- In the test room, measure the flow from the heat register using a garbage bag placed over the register and time how long it takes to fill the bag. Flow rates will be roughly estimated by this test.
- While the door is still closed, measure the pressure difference* with an electronic micro manometer.
- Note if the room also has a return air grill.
- If there is a return air duct in the room, block the return air grill and repeat the test for that room. Flow measurement with the bag is not possible.
- Note the room door undercut.
- You may measure ΔP across all doors to be tested then proceed to measure flows after all ΔP readings have been taken. Just ensure that doors that were closed for ΔP are still closed when going around to measure flows.

* The pressure difference was measured between the room and the remainder of the house. This was usually the pressure drop across the door between the room being tested and a central corridor.

Duct Leakage Test

Part One

- Tape over all forced air system's supply and return air grills (use of precut pieces of cardboard can be used to accelerate this process).
- Install a pressure gauge across the house envelope and zero it (the airtightness test equipment sealed door and pressure gauge can be used for this purpose).
- Turn on the furnace fan to the speed it runs at during furnace operation.
- Record any house pressure changes on the house pressure gauge.
- Check the pressure at least one supply duct and one return duct using a micro manometer (this pressure reading at the supply register is required for the second part of this test).
- Turn off the furnace fan.

Part Two

- Open the furnace fan compartment door.
- Block off the return side of the duct work from the fan compartment using cardboard and tape.
- Recheck the house pressure gauge and rezero it if it has drifted.
- Turn the furnace fan on again.

At this point, the flow of air into the supply side of the duct work should be greater than when the return side was open and the fan compartment door closed since there should be less resistance at the fan. The same flow of air into the supply side as before must now be achieved by creating the same pressure restrictions at the fan.

- Check the pressure at the supply duct that was measured in part one.

- Close the furnace fan compartment door gradually until the same ΔP is obtained at the previously measured supply register.

- Check the pressure on the house pressure gauge and record any difference if not zero while maintaining the pressure at the supply register as in part one.

Pressure & C02 Readings

Pressure Reading

- Incline manometer should be placed in the basement near a window or opening through which a hose may be run to the exterior of the house. The hose should be placed in such a fashion that it will measure static pressures. This means that wind should not affect the results. The incline manometer should be placed so it is not disturbed by the occupants of the house yet is accessible to read without having to be moved. It should be left in the home for a period of 5-8 days.

- The manometer, whether it be a block (incline) or an electronic manometer, should be zeroed before operation. Occupants should be told to read it three to four times a day and in different weather conditions which may effect pressure differential, eg. sudden temperature drop.

- If using the inclined manometer the occupant should be aware of how to read the meniscus in order to determine proper values which should be taken to the nearest Pa.

Carbon Dioxide Reading

- The C02 monitor should be placed in the bedroom away from the bed in order to avoid abnormal readings which may occur from being close to the monitor. It should be left with the occupant for the same amount of time as the basement depressurization measuring equipment.

- Occupants should be advised to take readings when they wake up in the morning, mid-day, or evening after work, and before going to sleep. Occupants should note any irregularities in the readings which may occur form closing of doors, placing numerous pets in the room, opening windows, etc. Occupants should be instructed on how to use the monitor in case of power failure or if the sensor is turned off. Occupants should also be aware of the "check" list on a **Monitoring Data** sheet.

Passive Ventilation Device Flows updated Jan 4,1993

This is a "nice to have info" type of test and is not a "must do" test. Priority is on the other tests and this will be done if time is available at the end of all of the other tests. The degree of iterations to be undertaken to determine the effects on these passive ventilation devices will also depend on the remaining time available at the end of all the other tests.

Rough quantification of passive ventilation device flows is to be determined in this test. The types of passive devices to be checked include roof turbine ventilators that exhaust air from one or more locations from the house and make-up air ducts for furnaces.

Roof turbine ventilators (exhausting indoor air)

If there is more than one exhausting location in the house, seal one of them and test the unsealed location. If both openings are opened the flow restriction created by the measuring device may cause the extraction from the turbine to exhaust air from the other location. Trials with both opened can be tried but these facts must be kept in mind. The duct test rig is not appropriate to measure the flow from such a device. As the DTR fan is used to supply the exhaust flow from the turbine, the turbine then turns faster and exhausts more air. It is then impossible to equalize the pressure difference between the DTR's fan and the exhaust grill of the turbine. The flow measurements are to be determined with a plastic garbage bag and stop watch.

Passive make-up air ducts:

The flows from these ducts can be measured from the interior at the duct end, if not connected to the return air plenum. The flow measurement is to be done using a polyethylene white garbage bag placed over the end of the duct and time to fill the bag calculated with a stop watch. This test could be done with the furnace on and off. Combinations of all exhaust fans on, all fans off, fans with or without furnace running could be tried but this would become too lengthy for this project. Note conditions at the time of the test. Determine the amount of air in the bag and relate to time required to get that volume to obtain the flow.

For both of these devices or others if present, crude measurements of duct lengths should be gathered as well as type and size of ducts, elbows and other details affecting the flow

APPENDIX B: Sample Homeowner Questionnaire and Data Recording Form

OCCUPANT QUESTIONNAIRE

House ID:_____

Address:_____

Date questionnaire completed:_____

Questionnaire completed by:_____

Inspection team (company):_____

Occupant Living Habits

Number of people at home: _____day _____night

Number of occupants: _____under 3 years _____3-10 years
_____over 10 years

Number of people who smoke? _____num. _____num. cigarettes per day in the home.

Average thermostat temperature (^{o}C): _____day _____night

Basement temperature same as main floor? ☐ yes ☐ no _____^{o}C
description:_____

Windows open at any time? ☐ no ☐ yes ☐ day ☐ night
Where in the house: _____
_____
_____

Showers/baths in one week/ all occupants? _____num. _____how long (hrs.)

Bathroom exhaust fan in use when bathing? ☐ no ☐ yes ☐ N/A ☐ sometimes

Bathroom window used when bathing? ☐ no ☐ yes ☐ N/A ☐ sometimes

Kitchen exhaust in use during cooking? ☐ no ☐ yes ☐ N/A ☐ sometimes

Do odours linger in kitchen? ☐ no ☐ yes ☐ sometimes

Water boiled in kettle during day/night? _____num. per day

Do you own a frost free refrigerator? ☐ no ☐ yes

Dishes washed by: ☐ hand _____num./week
☐ dishwasher _____num./week

Do you own a washer? ☐ no ☐ yes _____loads/week
dryer? ☐ no ☐ yes

Is dryer vented to outside? ☐ no ☐ yes
☐ N/A ☐ sometimes

Do you hang clothes inside to dry? ☐ no ☐ yes ☐ sometimes

Do you "air out" the house? ☐ no ☐ yes _____times/month

Assessment of Home Comfort and Air Quality Levels

Hot or cold spots in the home? ☐ no ☐ yes ☐ sometimes

Description: _____
_____
_____

Main floor (2nd floor) area "cold"? ☐ no ☐ yes ☐ sometimes

Description: _____
_____
_____

Basement warmer than rest of house? ☐ no ☐ yes ☐ sometimes

Heat distribution even throughout house? ☐ no ☐ yes ☐ sometimes
Comment: _____

House temperature acceptable during coldest weather ?
☐ no ☐ yes ☐ sometimes

Are cold drafts noticeable? ☐ floors ☐ windows ☐ fireplace ☐ doors ☐ electrical outlets ☐ other: _____

Noticeable areas of air leakage? (staining, dust markings, etc.) ☐ no ☐ yes ☐ sometimes

Any respiratory health problems in the house? ☐ no ☐ yes ☐ sometimes

Describe: _____

_____

Allergy symptoms indoors? ☐ no ☐ yes ☐ sometimes

Describe: _____

_____

Humidifier use in winter months? ☐ no ☐ yes ☐ sometimes

De-humidifier use in summer months? ☐ no ☐ yes ☐ sometimes

Estimate of house airtightness. ☐ Leaky ☐ Average ☐ Airtight

Heating and Cooling System

Primary heating system.

Forced air: ☐ gas ☐ electric ☐ oil ☐ wood ☐ heat pump ☐ other (comment): _____

Secondary heating system.

Forced air: ☐ gas ☐ electric ☐ oil ☐ other: _____

Steam/hot water: ☐ gas ☐ electric ☐ oil ☐ other: _____

Electric: ☐ radiant ☐ baseboard ☐ heat pump

Wood: ☐ fireplace ☐ conventional wood stove ☐ airtight wood stove

Other: _____

Combination of fuel or system (describe): _____

_____

_____

Location of chimney: ☐ interior ☐ exterior
Type of chimney: ☐ masonry ☐ metal ☐ insulated metal
Comments: _____

Combustion air supply duct: ☐ furnace ☐ fireplace ☐ wood stove ☐ boiler ☐ water heater

Heating system serviced in the last? ☐ < 2 yrs ☐ 2 - 5 yrs ☐ > 5 yrs
Does furnace have two speed fan? ☐ no ☐ yes

Is furnace fan run:

a) during furnace cycle only	☐ no	☐ yes	☐ high speed ☐ low speed
b) continuously in winter	☐ no	☐ yes	☐ high speed ☐ low speed
c) continuously all year	☐ no	☐ yes	☐ high speed ☐ low speed
d) continuously during cooling season	☐ no	☐ yes	☐ high speed ☐ low speed

Does furnace have an electronic or high efficiency filter?
☐ no ☐ yes

Is there a central air-conditioning coil located in furnace plenum?
☐ no ☐ yes

Combustion odours noticeable from heating system?
☐ no ☐ yes ☐ sometimes

Heavy soot accumulations inside or around flue pipe and furnace room?
☐ no ☐ yes

Cost of fuel bill over year? $_____
Comment: _____

Higher than expected fuel bills? ☐ no ☐ yes ☐ sometimes

Secondary heating source use? ☐ never _____% ☐ N/A

Difficult to light fireplace/stove? ☐ no ☐ yes ☐ sometimes ☐ N/A

Odours of smoke in house? ☐ no ☐ yes ☐ sometimes ☐ N/A

Staining occurs on mantle above? ☐ no ☐ yes ☐ sometimes ☐ N/A

Moisture Observations

Seasonal conditions: (Homeowners' Perceptions)	Dry	Average (comfortable)	Humid	% Humidity (if available)
Winter	☐	☐	☐	_____
Spring	☐	☐	☐	_____
Fall	☐	☐	☐	_____
Summer	☐	☐	☐	_____

Does furnace humidifier work well? ☐ no ☐ yes ☐ N/A

Moisture on windows? ☐ no ☐ yes
What room(s)? _____

Describe window type: _____

Fogging or frosting between glass? ☐ no ☐ yes ☐ sometimes

Moisture stains on walls? ☐ no ☐ yes
What room(s)? _____

Moisture stains on floors? ☐ no ☐ yes
What room(s)? _____

Musty smell in basement? ☐ no ☐ yes ☐ sometimes

Moisture stains in basement? ☐ no ☐ yes ☐ sometimes
Basement flooding experienced? ☐ no ☐ yes ☐ sometimes
Moisture stains around exhaust fans? ☐ no ☐ yes ☐ N/A
Other moisture observations? ☐ no ☐ yes
Description: _____

_____

Time of year with most moisture observations? ☐ Spring ☐ Summer ☐ Autumn ☐ Winter

Mold and mildew growth on walls and ceilings? ☐ no ☐ yes

Description: _____

Retrofit Measures

Has any retrofit work been done in the past 5 years? ☐ no ☐ yes

If yes: Component: _____

Date: _____

Description: _____

Component: _____

Date: _____

Description: _____

Component: _____

Date: _____

Description: _____

Other Comments: _____

House I.D.#: _____

House Characteristics Data Sheet

Address: _____

Year of construction: _____ Year of addition (if any): _____

Number of storeys: ☐ 1 storey ☐ 1.5 storey ☐ 2 storey ☐ 2.5 storey
☐ 3 storey ☐ split level
☐ other: _____

Type of structure: ☐ platform ☐ balloon ☐ solid masonry
☐ other: _____

Exterior wall cladding: ☐ brick ☐ wood ☐ stucco
☐ stone ☐ vinyl/aluminum/metal
☐ other or combination: _____

Foundation: ☐ full basement ☐ crawl space ☐ slab on grade
☐ other: _____

Foundation type: ☐ poured conc. ☐ conc. block ☐ stone
☐ other: _____

Other observations: _____

House I.D.#: _____

Room Temperature and Relative Humidity, Wall Temperatures

Date:			Time:			Ext. Temp. (°C):
Level (Room)	Air Temp. (°C)	RH (%)	Wall Temp. (°C)	Wall Tested	Furnace On/Off	Notes
Basement						
1st Floor						
2nd Floor						

Wood Moisture Content

Location (eg. bsmt, furnace rm, crawlspace, etc.): _____

Structural Component (eg. joist, stud, header, etc.): _____

Moisture content (%): ____, Room RH (%): _____

Additional moisture readings if any moisture problem areas found:

Floor/Room	Location	Room RH (%)	Air Temp. (°C)	Wood Moisture (%)	Wood Temp. (°C)	Notes

Comments: _____

_____

House I.D.#: _____

Neutral Pressure Plane

Bottom of 1st floor ☐ Bottom of 2nd floor ☐

Half height of 1st floor ☐ Half height of 2nd floor ☐

Top of 1st floor ☐ Top of 2nd floor ☐

Other/Comments: (wind conditions, etc.)_____

_____

_____

Thermostat Check

Outdoor temperature:_____^{0}C Time: _____

Furnace start Furnace stop

Thermostat temperature: _____^{0}C Thermostat temperature: _____^{0}C

Actual temperature: _____^{0}C Actual temperature: _____^{0}C

Thermostat setting: _____^{0}C Furnace cycle: _____min.

Furnace burning capacity: _____Btu/h or kW (circle)

Comments: _____

_____

Room Pressurization

Room	Supply	Return	Pressure Return Open (Pa)	Pressure Return Sealed (Pa)	Flow at register (sec.)	Flow (L/s)	Door Undercut circle in/cm

Comments:_____

_____

House I.D.#: _____

Duct Leakage Test

1. Initial House ΔP:_____Pa
   Furnace Fan On. House ΔP: _____Pa Change in ΔP:_____Pa
   Supply register ΔP:_____Pa Location: _____
   Return register ΔP:_____Pa Location: _____
   Comments:_____
   _____
   _____

2. Return air duct blocked at furnace? ☐
   Before turning furnace fan on. House ΔP:_____Pa
   Furnace Fan On? ☐
   Supply register ΔP:_____Pa (Same register as in Part 1 of test)
   Furnace Fan On. House ΔP: _____Pa Change in ΔP :_____Pa
   Comments:_____
   _____
   _____

Weather conditions at time of test? Winds (km/h): ___ Direction: _____

Combustion Safety Check

Kitchen Fan ☐ Yes ☐ No
Bathroom Fan(s) ☐ Yes ☐ No #:___
Clothes Dryer ☐ Yes ☐ No
Central Vacuum ☐ Yes ☐ No
Furnace Fan ☐ On ☐ Off
HRV ☐ On ☐ Off ☐ N/A
Fireplace ☐ On ☐ Off
Woodstove ☐ On ☐ Off
Other Exhaust ☐ On ☐ Off
Describe:_____

Initial House ΔP ___Pa
Exhausted House ΔP ____Pa
Depressurization Effect _____ Pa
Furnace Flue Backdrafting ☐ Yes ☐ No

Comments:_____
_____

House I.D.#:_____

Passive Ventilation

Device	Bag Fill Time (s)	Flow (L/s)	Furnace Burner On/Off

Further Comments Regarding Any Test

House I.D.#: _____

House Sketch (One per Floor, Including Basement)

Indicate: 1. North Arrow, 2. Supply Grills: ▭ S, 3. Return Grills: ▭ R, 4. Where surface temps were taken: (T)→,

5. Floor-to-floor heights and enough dimensions for rough volume and envelope surface area calcs.

House I.D.#: _____

House Sketch (One per Floor, Including Basement)

Indicate: 1. North Arrow, 2. Supply Grills: ☐ S, 3. Return Grills: ☐ R, 4. Where surface temps were taken: Ⓣ→,

5. Floor-to-floor heights and enough dimensions for rough volume and envelope surface area calcs.

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AIRTIGHTNESS TEST DATA (Field Data Sheet)

Job #:_____

Test Ident'n:_____

Date:_____

Exterior Temp:_____ °C

Wind Speed:_____Km/h

Envelope Surface Area:_____ m^2

House Volume:_____m^3

ΔP Reading With Fan Off and Sealed - Start:_____

Pa Finish:_____Pa

Test Performed by:_____

Time:_____

House Conditions, Modifications, etc: _____

ΔP Reading (Pa)	Adjust't (Pa)	Measured ΔP (Pa)	Flow Meter Reading (L/S)	Disk Factor	Measured Flow(L/S)	Inside Temp(°C)

Comments, Notes:_____

House ID:_____

Monitoring Data

Date	Time	Pressure Reading (Pa)	Carbon Dioxide (CO_2)	Weather conditions/ comments (calm, windy)

APPENDIX C: Results of Testing and Monitoring

Duct Leakage Testing in Manitoba, Ontario, Quebec, and Nova Scotia

	Supply and Return Effect			Supply Effect Only				
House ID	Initial House P	Fan On House P	Change in P	Before Fan On House P	Fan On House P	Change in P	Winds	Manometer Location
ON01	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail
ON02	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail
ON03	2.5	2	-0.5	3	3.5	0.5	7 km/h	Bsmt, finished rm
ON04	3	2.5	-0.5	3	2.5	-0.5	Calm	Bsmt
ON05	5	5	0	5	5.5	0.5	Calm	1st Floor
ON06	1	1	0	1	3	2	16 km/h	Bsmt
ON07	5	5.5	0.5	7	8	1	Gusty	Bsmt
ON08	6	6	0	6	9.5	3.5	Calm	Bsmt
ON09	8	9.5	1.5	8	9.5	1.5	Light	Bsmt
ON10	2	2.5	0.5	2	2.5	0.5	Gusty	Bsmt
ON11	3	3	0	3	3	0	Calm	Bsmt, finished rm
ON12	4	4.5	0.5	4	4.5	0.5	Calm	Bsmt
PQ01	0	0.3	0.3	N Avail	N Avail	N Avail	N Avail	N Avail
PQ02	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail
PQ03	1.5	1	-0.5	1	1.5	0.5	19 km/h	Bsmt
PQ04	3	3	0	3	3	0	Calm	Bsmt
MB01	1	1	0	0	1	1	N Avail	1st Floor
MB02	0	0.5	0.5	0	0	0	9 km/h	1st Floor
MB03	0	1	1	7	7	0	24 km/h	1st Floor
MB04	3	3	0	3	4	1	25-30 km/h	1st Floor
MB05	3	3	0	3	3	0	19 km/h	1st Floor
MB06	1.5	1.5	0	2	2	0	15 km/h	1st Floor
MB07	3	3	0	3	3	0	4 km/h	1st Floor
MB08	4	5	1	4	5	2	28-37 km/h	1st Floor
MB09	0	0	0	0	N Avail	N Avail	N Avail	1st Floor
MB10	4	4	0	4	4	0	17 km/h	1st Floor
MB11	6	6	0	6	6	0	7 km/h	1st Floor
MB12	2	2	0	2	2	0	30-39 km/h	1st Floor
NS01	3.5	4	0.5	3.5	4	0.5	Calm	1st Floor
NS02	3	7	4	5	8	3	Calm	1st Floor
NS03	2	5	3	4	6	2	20 km/h	1st Floor
NS04	1	4	3	1	4.5	3.5	Light	1st Floor
NS05	4	6	2	3	4	1	Light	1st Floor
NS06	2	5	3	2.5	5.5	3	Light	1st Floor
NS07	1	1	0	1.5	1.5	0	Light	1st Floor
NS08	1.5	1.5	0	1	1.5	0.5	Light	1st Floor
NS09	0	0.5	0.5	0	0.75	0.8	Calm	1st Floor
NS10	0.5	1	0.5	1	1	0	Light	1st Floor
NS11	0.5	1.5	1	1	1.5	0.5	Light	1st Floor
NS12	0	2	2	0	N Avail	N Avail	Light	1st Floor
With Fresh Air Duct Opened to Return								
MB01	1	1	0	0	1	1	N Avail	1st Floor
MB04	3	3	0	3	1.5	-1.5	25-30 km/h	1st Floor
MB07	3	2	-1	3	3	0	4 km/h	1st Floor
MB08	5	6	1	4	6	2	28-37 km/h	1st Floor
MB10	4	4	0	4	4	0	17 km/h	1st Floor
MB11	4	3	1	4	4	0	7 km/h	1st Floor

Duct leakage testing using cross-envelope pressures was performed in Manitoba, Ontario, Quebec, and Nova Scotia. Positive pressure represents house depressurization. The interpretation of the data listed below should be as follows:
Initial House P is the cross-envelope pressure before turning on the furnace fan.
The Fan On House P is the cross-envelope pressure after the furnace fan has been turned on.
The Before Fan On House P is the cross-envelope pressure once the return side has been blocked (after supply and return effect testing) but before the fan is turned on for supply effect only testing.

Basement Depressurization Results

Basement Depressurization (Pa)				
House ID	Min	Ave.	Max	#Rdgs.
BC01	0	1.6	3.2	9
BC02	0	1.1	2	22
BC03	0	1.8	3.8	10
BC04	-2.5	1.2	3.7	16
BC05	-2.5	1.2	8.7	19
BC06	0	1.2	2.5	30
BC07	N Avail	N Avail	N Avail	N Avail
BC08	0.6	1.1	1.2	23
BC09	0	1.3	3	19
BC10	0	1.2	2.5	16
BC11	0	1.3	3	33
BC12	0	1.7	5.5	23
ON01	0	2.1	5.5	18
ON03	0	1.3	3	31
ON04	3	4.3	7	10
ON05	3	5.9	10	20
ON06	0	7.8	15	31
ON07	-4	3.6	12	21
ON08	5	8.8	15	29
ON09	3	3.3	4	19
ON10	0	3.8	15	21
ON11	1	2.9	4	32
ON12	2.5	6.7	10	24
PQ01	1.3	2.3	3.9	3
PQ02	1.5	3.2	5	18
PQ03	0.5	3.3	5	28
PQ04	3	4.5	12	22
NS01	N Avail	N Avail	N Avail	N Avail
NS02	2.2	5	12.5	18
NS03	2.4	2.8	3.7	33
NS04	-3.7	3.7	9	27
NS05	2.7	5.1	8.5	21
NS06	-25	N Avail	16.6	N Avail
NS07	2.5	5.1	7.5	27
NS08	N Avail	N Avail	N Avail	N Avail
NS09	-7.8	N Avail	25	N Avail
NS10	0	12.5	55	16
NS11	-3	N Avail	22.5	N Avail
NS12	-2.5	0.9	3.7	32
MB01	2	2.9	4	15
MB02	1.5	3.8	6	21
MB03	0	0.5	1	17
MB04	0	0.5	1	49
MB05	0	0.5	0.8	8
MB06	2	4.9	7.5	21
MB07	3	5.1	10	24
MB08	2	4	9	30
MB09	0	1.2	2.5	20
MB10	0	3.1	7.5	25
MB11	0	2.8	10.5	24
MB12	-2	1.2	11.5	45

** Note:Positive entries represent basement depressurization with respect to the outdoors

Neutral Pressure Plane

HOUSE ID	NPP LOCATION	FLOORS ABOVE GRADE
BC02	half height of 1st floor	1
BC09	half height of 1st floor	1
PQ01	half height of 1st floor	1
MB01	half height of 1st floor	1
NS09	half height of 1st floor	1
NS11	half height of 1st floor	1
NS08	half height of 1st floor	1
BC10	top of 1st floor	1
PQ02	top of 1st floor	1
PQ03	top of 1st floor	1
PQ04	top of 1st floor	1
MB04	top of 1st floor	1
MB05	top of 1st floor	1
MB06	top of 1st floor	1
NS02	top of 1st floor	1
NS04	top of 1st floor	1
ON07	bottom of 1st floor	2
BC06	half height of 1st floor	2
ON09	half height of 1st floor	2
MB12	half height of 1st floor	2
BC01	top of 1st floor	2
BC03	top of 1st floor	2
BC11	top of 1st floor	2
BC12	top of 1st floor	2
ON10	top of 1st floor	2
ON12	top of 1st floor	2
MB10	top of 1st floor	2
BC04	bottom of 2nd floor	2
ON02	bottom of 2nd floor	2
ON03	bottom of 2nd floor	2
MB09	bottom of 2nd floor	2
NS12	bottom of 2nd floor	2
BC05	half height of 2nd floor	2
BC07	half height of 2nd floor	2
BC08	half height of 2nd floor	2
ON01	half height of 2nd floor	2
ON04	half height of 2nd floor	2
ON06	half height of 2nd floor	2
ON08	half height of 2nd floor	2
MB02	half height of 2nd floor	2
MB03	half height of 2nd floor	2
MB07	half height of 2nd floor	2
MB08	half height of 2nd floor	2
NS01	half height of 2nd floor	2
NS05	half height of 2nd floor	2
NS07	half height of 2nd floor	2
ON11	top of 2nd floor	2
NS03	top of 2nd floor	2
NS06	top of 2nd floor	2
NS10	top of 2nd floor	2
ON05	half height of 2nd floor	3

Note: One storey and a half houses are listed here as having 2 floors to indicate the possible NPP locations.

Results of Carbon Dioxide Monitoring

House ID	Lowest Reading	Highest Reading	Average
BC01	517	987	704
BC02	508	1610	941
BC03	540	1085	875
BC04	515	767	644
BC05	398	960	640
BC06	586	1230	742
BC07	N Avail	N Avail	N Avail
BC08	482	938	677
BC09	506	690	544
BC10	530	1120	705
BC11	450	785	605
BC12	382	684	574
ON01	N Avail	N Avail	N Avail
ON02	N Avail	N Avail	N Avail
ON03	311	864	522
ON04	720	1424	1118
ON05	455	815	600
ON06	322	1094	614
ON07	335	830	518
ON08	310	1005	559
ON09	430	1336	786
ON10	361	586	449
ON11	497	1486	863
ON12	453	1478	772
PQ01	402	1091	647
PQ02	495	1235	734
PQ03	253	1651	896
PQ04	548	1027	788
MB01	686	1137	904
MB02	509	1294	772
MB03	425	1040	667
MB04	668	969	840
MB05	443	864	632
MB06	568	2000	1000
MB07	775	1030	887
MB08	353	706	559
MB09	544	1009	750
MB10	509	1156	765
MB11	312	1587	877
MB12	784	1666	1087
NS01	574	1207	790
NS02	571	1192	787
NS03	650	1467	987
NS04	475	1148	784
NS05	415	663	533
NS06	512	1408	751
NS07	492	886	662
NS08	435	970	677
NS09	366	940	581
NS10	433	866	697
NS11	443	2128	1288
NS12	415	1039	665

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	LOCATION	RETURN SEALED (PA)	RETURN OPEN OR NO RETURN (PA)	TIME (SEC)	FLOW (L/S)	DOOR UNDERCUT (cm)
NS01	Master Bedroom 1		3.2	4	27	0.3
	Bedroom A		3.2	6	17	0.0
	Bath		1.7	6	17	1.3
	Bedroom C		3	10	10	0.5
	Family Room		5	2.7	37	0.8
				2.9	35	
	Bath		0.5	3.5	30	2.7
NS02	Master Bedroom 1		0	5.2	21	1.6
	Bath		0.5	8.2	12	1.0
	Bedroom 2		1.2	2.4	39	1.1
	Bedroom 3		1	3.4	31	1.4
	Hall		1.5	0	0	1.0
NS03	Master Bedroom		4.5	3.2	32	1.3
	Bedroom 2		2	4.9	22	1.0
	Bedroom 3		3.7	2.9	35	1.3
	Main bath		0.7	5.1	21	1.9
	Ensuite bath		5	4.5	24	1.3
	Ensuite closet		6.2	6.9	15	1.0
	Basement closet		0.5	3.3	31	3.3
	Basement Store Rm		0	2.6	37	3.5
	Basement Spare Rm		0.2	2.7	36	3.5
	Basement Furnace Rm		0	0	0	3.3
NS04	Bedroom 1		2.5	3.4		1.4
	Bedroom 2	0.5	0	9.9-23.0	10-<5	1.4
	Bedroom 3	1.2	0.2	5.0-5.8	22-18	0.3
	Bath		1.2	8.2	12	1.3
	Office	0.5	0.5	-	-	1.1
	Bath downstairs		0	60+	0	0.6
NS05	Bedroom 2		0.5	4.5	23	3.5
	Bath A		1.7	3	34	1.6
	Bedroom 3		1.2	2.9	34	2.7
	Bedroom 1	0.5	0.5	3.2-3.3	33-33	3.2
	Bath B		2	4	27	0.0
	Family Room		0	0	0	1.3
NS06	Bedroom 1		0.5	18.5	<5	1.9
				12.7	7	2.0
	Bedroom 4		0.5	5.6	18	1.9
	Bedroom 3		0.5	11.4	9	1.9
	Bedroom 2		0.4	10.3	10	1.9
	Bath A		0	15	7	1.7
	Bath B		0.2	16.1	6	1.7
NS07	Bedroom 1		2.9	23.4	<5	0.8
				7.8	13	
	Bedroom 2		0.6	109	<5	0.5
NS08	Bedroom 1		8	2.3	39	1.3
	Bedroom 2		6.5	2.5	38	1.3
	Bath 1 up		0.3	6.1	17	1.9
	Bath 2 on		1.3	3.4	31	0.0
	Bedroom 3 on		0.7	2.7	36	1.0

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	LOCATION	RETURN SEALED (PA)	RETURN OPEN OR NO RETURN (PA)	TIME (SEC)	FLOW (L/S)	DOOR UNDERCUT (cm)
NS09	Bath		0.25	2.4	39	1.0
	Bedroom 1		0.58	2.3	39	0.2
	Bedroom 2		0.4	2.5	38	0.3
	Bedroom 3		0.28	3.3	33	0.3
NS10	Bedroom 1 Main*		0.5	3.1	33	0.2
				2.9	35	.
	Bedroom 2*		1	4	27	0.5
	Bedroom 3		1.2	4.5	24	0.1
	Bedroom 4			4.3	25	0.0
	* Br 1 & 2 have floor grills for passive circ. of air from downstairs					
	Bedroom 4 has door to original kitchen, which is open to kitchen below					
NS11	Bedroom 1		6.2	4	27	0.0
	Bedroom 2		6.8	3.1	33	0.6
	Bedroom 3		(39.9) 4	4.7	22	0.0
	Bath		(39.9) 4	2.8	36	1.0
	Bed 3 Pressure written on sheet is 0.160 and bath is 0.158 H20					
NS12	Bedroom 1	no conventional duct work to room				
	Bedroom 2	no conventional duct work to room				
	Bedroom 3	no conventional duct work to room				
	Bath		0.5	16.2	6	0.6
	Family Room		0	6.1	17	1.9
	Spare		0	3.2	32	1.9
				6.6	16	
NS 10, 12 to be omitted from comparison of all others due to the particularities noted						

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	LOCATION	RETURN SEALED (PA)	RETURN OPEN OR NO RETURN (PA)	TIME (SEC)	FLOW (L/S)	DOOR UNDERCUT (cm)
MB01	Master Bedroom	3	0		28-31	1.3
			3		14-20	
	Master Bath		0		7 to 8	2.2
	Main Bath		1.25		24	1.0
	Den	2	-1		34	1.3
	N.E. Bedroom	3	-5		33	0.6
MB02	Master Bedroom	3.75	0.25		51	0.0
	Dining Room	0.5	0		24	2.2
	Bathroom		0.5		12	0.6
	2nd Floor Bedroom	1.25	0.75		32	0.5
MB03	Master bedroom	0.25	0.25		35	1.0
	Small Room	1.25	0		17	0.3
	Large Bedroom	1	0		37	1.9
	Bathroom		2			
MB04	Master Bath		0.75		24	0.0
	Master bedroom	5	2.25		25	0.6
	Small Bedroom	1.75	0.25		26	1.9
	Middle Bedroom	1.5	0.25		26	2.5
	Main Bath		0.75			1.0
	Basement Bedroom		1		22	1.9
	Storage		0.25			2.5
MB05	Bathroom		1.5		34 to 35	1.3
	Master Bedroom		3		26 to 30	1.3
	Bedroom		1.5		32 to 33	1.3
	Basement Room		0.5		40 to 45	1.9
MB06	Basement Den		0		0	0.0
	Basement Laundry		0		0	1.0
	Basement Bath		1			
	Small Bedroom	5	2		39	1.9
	Master Bath		1		23	1.3
	Master Bedroom	4	2		43	1.9
	Bath		0.5		18	1.9
	Middle Bedroom	1	-1		21	
MB07	N.E. Bedroom	4.5	3		22	1.3
					22	
	Master Bath	0	0		22	1.9
	Master Bedroom	3	3		23	1.3
					24	
	S-W Bedroom - furniture blocks return		1		24	1.3
					24	
	N-W Bedroom - furniture blocks return		0.5		11	1.3
					5	
	Bath		-0.5			1.6

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	LOCATION	RETURN SEALED (PA)	RETURN OPEN OR NO RETURN (PA)	TIME (SEC)	FLOW (L/S)	DOOR UNDERCUT (cm)
MB08	Basement Weight Rm		0		19	2.2
	S.W. Bedroom		0		18	1.3
	Furnace Room		0			
	Main Floor Bedroom	8	2		37	1.0
	N. Centre Bedroom	1	0		15	1.3
	Back Bath		1.5		33	3.5
	2nd Floor Bath		3			1.9
	Main Bedroom	3	2		39	1.9
MB09	Main Floor Den	0	-0.5		7	1.9
	Small Bedroom 1	1	0		11	1.0
	Small Bedroom 2	2	0.5		36	1.3
	Toy Room	2	0		10	0.0
	Master Bath		1		8	1.9
	Master Bedroom	2	1		5	0.0
	2nd Small Master Bath		1		24	2.5
	Powder Room		1		12	1.9
MB10	Basement		-2			2.5
	N.W. Bedroom	0	-1		8	1.0
	S.W. Bedroom	0	-1		7	1.0
	Back Entry		1		12	2.2
	Bath		1		17	
	2nd Bath		1		18	1.6
	Master Bedroom	4	2		20	1.9
MB11	Master Bedroom	2	1			2.2
	Ensuite		1		10	2.2
	Main Bath		1			2.2
	Bedroom Main Floor	2	1		27	2.5
	Basement bedroom	2	-2		26	1.3
	Basement Bath		0.5		17	1.3
	Basement Den	2	-0.5		13	1.0
	Furnace/Laundry Rm	-2.5	-1.5		21	1.3
		* -2.5 with clothes dryer ON				
MB12	Back Entry	0	-0.5		12	1.0
	Powder Room		0		32	2.2
	Sewing Room	3	0		16	2.5
	Living Room	3	2		10	2.5
	2nd Bedroom		1		18	1.9
	Master Bedroom	2	0		16	1.9
	Bath	2	0		27	1.9
	Toilet		0		27	1.9
	Library	1	-1		27	1.3
	Basement		0		N/A	2.5

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	LOCATION	RETURN SEALED (PA)	RETURN OPEN OR NO RETURN (PA)	TIME (SEC)	FLOW (L/S)	DOOR UNDERCUT (cm)
BC01	N. Bedroom		0.8		16	3.2
	Bath		0.4		10	0.6
	S. Bedroom		0		16	4.4
	Master Bedroom		-0.9		11	1.9
	Childrens Room		0		5	1.9
BC02	Master Bedroom		1.8		14	0.3
	Bedroom 3		0.8		16	0.0
	Bath		1.2		16	0.6
	Bedroom 2		2.9		15	0.0
BC03	Bedroom 3		3.3		8	0.6
	Bedroom 2		1			1.0
	Bath		0.6		8	0.0
	Master Bedroom		1.6			0.3
	Ensuite		0.2			0.6
	Master		1.9		14	0.3
	Basement		-1.8			0.0
BC04	Master		1.1		11	0.3
	Ensuite		4		6	0.6
	Bath 2		0.2		4	0.6
	Bedroom #2		-0.7		6	0.6
	Bedroom #3		0.7		9	1.0
	Upstairs		-0.5			
	Master		2		18	
	Ensuite		10		35	
	Master		4		21	
BC05	Computer Room		0.1			1.3
	Bathroom		0.3			2.5
	Bedroom 1		0.4		3	0.0
	Bedroom 2		0.8		8	1.3
	Master Bedroom		1.8		12	1.3
					11	1.3
BC06	Master Bedroom	0.7	-0.6		7	0.6
	Bath 1		1.6		17	0.6
	Bedroom 2		0.4		10	1.9
	Office		3		12	0.0
	Bedroom 3		1.7		34	0.6
BC07	Bedroom 3		2		14	0.6
	Bedroom 2		1.5		14	1.3
	Bedroom 2		1.5		12	1.3
	Master		8.1		34	1.0
	Bath 2		0.9		4	0.6
BC08	Bedroom 4		4.4		22	2.5
	Bedroom 6		5.3		37	3.2
	Bedroom 5		4.8		36	2.5
	Master				2 to 3	
BC09	Master		3.3		21	0.0
	Spare Bedroom		2		18	0.6
	Bath		3.5		19	0.0

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	LOCATION	RETURN SEALED (PA)	RETURN OPEN OR NO RETURN (PA)	TIME (SEC)	FLOW (L/S)	DOOR UNDERCUT (cm)
BC10	Bedroom 1	0	-0.7		22	0.6
	Bedroom 3		1		21	1.0
	Bath				4	1.3
BC11	Bath 2nd Floor		0			3.2
	Bedroom 2		0.4			2.5
	TV Room		0			1.3
	M. Bedroom	0	-0.3			0.6
BC12	M. Bedroom		0.5		33	1.0
	TV Room		0.8		11	0.6
	Bedroom 2		6.2		22	0.0
	Bedroom 3		4.1		19	0.6
	Bedroom 4		4.2		22	0.3
	Exercise Room		0.8		15	0.6
	Bathroom		1.2		15	0.6

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	LOCATION	RETURN SEALED (PA)	RETURN OPEN OR NO RETURN (PA)	TIME (SEC)	FLOW (L/S)	DOOR UNDERCUT (cm)
ON01	Master Br	R	-0.1			
	Bed room #2	R	-0.2			
	Bedroom #3	R	-0.5			
	Main floor bath room		1.1			
	Basement powder room		-0.8			
	Furnace room		-1.6			
	Cedar storage room		3			
ON02	Bedroom #3	R	-1			
	Bedroom #2		0.5			
	Ensuite		-0.2			
	Bedroom #1	R	-0.3			
	Main bath		0			
	Powder room		-0.1			
	Basement		-2.1			
ON03	Master Bedroom	1.1	0.3	6	10 to 15	2.5
	Bedroom 2	1.3	0.2	8	10 to 15	2.5
	Bedroom 3		0.6	11	5 to 10	2.0
	Bath 1		0.7	15	5 to 10	1.5
	Ensuite		0.6	16	5 to 10	1.5
	Furnace Room		-1.1			1.0
ON04	Master Bedroom	-0.3	1.5	5	15 to 20	2.0
	Ensuite		1	11	5 to 10	2.5
	Bedroom 2		0.7	30	<5	2.0
	Bedroom 3		2.6	5	15 to 20	2.0
	Bath 1		1.7	7	10 to 15	2.0
	Bath 2		2	6	10 to 15	2.0
	Laundry		0.4			2.5
	Basement Door		1.6			2.0
	Furnace Door		-0.7			4.0
	Office		-0.4			5.0
ON05	Dining Room		0.1	11.7	5 to 10	3.0
	Living Room		0.1			2.0
	Master Bedroom		1.2	5.3	15 to 20	2.0
	Study		0.2	6.3	10 to 15	1.5
	Bedroom 2		0.5	15.8	5 to 10	1.5
	Bedroom 3		1.3			1.5
	Bath		0.7	15.7	5 to 10	1.5
	Den		-0.3	14.9	5 to 10	3.0
	Kitchen		-0.8	13.7	5 to 10	3.0
ON06	Door to Basement		-1.1			2.0
	Floor 1 Bath		0	19.1	<5	1.5
	Laundry		0.7	8.1	10 to 15	2.5
	Vestibule		1.8	5.5	10 to 15	1.0
	Ensuite Bath		1.3	4.1	15 to 20	1.0
	Master Bedroom		0.4	7.1	10 to 15	1.0
	Bedroom 2		0.4	3.6	25 to 30	1.5
	Bedroom 3		2.3	4.9	15 to 20	2.0
	2nd Floor Bath		-0.3		0	1.5
	Bedroom 3-walk-in-closet		0.6	14.1	5 to 10	1.0

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	LOCATION	RETURN SEALED (PA)	RETURN OPEN OR NO RETURN (PA)	TIME (SEC)	FLOW (L/S)	DOOR UNDERCUT (cm)
ON07	1st Floor Bath		0.2	40	<5	2.0
	Laundry/Family Rm		0.5	16.3	5 to 10	
	Ensuite Bath		0.1	15.7	5 to 10	2.0
	Walk in Closet		0.1	N/A		2.0
	Master Bedroom		0.4	60	<5	
	Master Bedroom			3.4	25 to 30	
	Sewing Room		0.3	11.4	5 to 10	
	TV Room		0.1	11.4	5 to 10	
	Bedroom 2		0.4	13.1	5 to 10	
	Bath		0.5	>60	<5	
ON08	Bedroom 1		8.2	3.1	30 to 35	0.0
	Master Bedroom		2.2	3.5	25 to 30	0.0
	Bedroom 3		5.5	3.8	20 to 25	0.0
	Bath		2.1			1.0
	Bedroom 4		7	3.8	20 to 25	0.3
	Powder Room		5.8			0.5
	Basement	1.1	1.2			1.5
	Furnace Room		1.5			0.0
ON09	Walk in Closet		0.7	11.5	5 to 10	1.5
	Ensuite Bath		-0.2	11.5	5 to 10	1.5
	Master Bedroom	1.1	0.6	13.5	5 to 10	0.5
	Bath, 2nd		0	29	<5	2.0
	Bedroom 2		0.5	14.2	5 to 10	1.0
	Bedroom 1		0.7	6.9	10 to 15	2.0
	Bath, 1st		0.5	6.1	10 to 15	2.5
	Laundry		0.3	19.9	<5	1.5
	Basement Door		-0.4	N/A		2.5
	Furnace Room		0.1	N/A		1.5
ON10	Bedroom 1		1.2			1.2
	Bedroom 3	0.2	-0.1			1.9
	Bedroom 2	0.3	0.3			1.2
	Bathroom		0.9			2.0
	Basement		1.4			0.2
	Furnace Room		-1.9			
ON11	Bedroom 3		1	11.3	5 to 10	1.0
	Bedroom 2		0.9	9.6	5 to 10	2.5
	Bedroom 1		4.2	5.7	10 to 15	0.3
	Main Floor Bath		0.3			
	Master/Sewing Room		1.1			
	Bedroom 4		0			
	Furnace Room		-0.8			1.0
	Basement bath		-0.1			

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	**LOCATION**	**RETURN SEALED (PA)**	**RETURN OPEN OR NO RETURN (PA)**	**TIME (SEC)**	**FLOW (L/S)**	**DOOR UNDERCUT (cm)**
ON12	Basement Door		-0.4			2.5
	Powder Room		0.3	19.5	<5	2.0
	Kitchen/Laundry Area	3.4	1.7	3.56	25 to 30	2.5
	Ensuite to M. Bedroom		0.9	10.8	5 to 10	1.0
	Master Bedroom/Hall	1.9	0.7	7	10 to 15	0.5
	Main Bathroom		0.9	15.5	5 to 10	0.5
	Bedroom 2	2.5	0.4	7.2	10 to 15	0.5
	Bedroom 1	0.9	0.4	5.96	10 to 15	0.5

Results of Room Pressurization Testing

		ROOM PRESSURIZATION		SUPPLY AIR FLOW		
HOUSE ID	LOCATION	RETURN SEALED (PA)	RETURN OPEN OR NO RETURN (PA)	TIME (SEC)	FLOW (L/S)	DOOR UNDERCUT (cm)
PQ1	Bath room		2.7			1.3
	Bedroom #2		0.3			2.5
	Bedroom #3		0.5			3.8
	Furnace room		-0.3			0.0
	Bedroom #1		0.1			2.5
	Laundry		-0.2			0.0
PQ2	Bedroom #1		12.7	1.3		
	Bedroom #2		5.7	1.5		
	Bathroom		15	2.1		
	Bedroom #3		7.2	2.1		
	Master bedroom (bsmnt)		1.3	3.4		
PQ3	Master bedroom		6.7	5.5	0 to 15	1.3
	Bedroom #2		4.8	2.5	35+	2.5
	Bedroom #3		4	3.4	5 to 30	2.5
	Bathroom		1.3	3.3	5 to 30	1.3
	Furnace room		0.2			0.0
PQ4	Master bedroom	4.1	-0.5	10 to 15		1.3
	Bedroom #2	1.3	-0.5	25 to 30		2.5
	Bathroom		0.9	10 to 15		0.5
	Study		0.8			
	Basement Bathroom		1			1.9
	Laundry room		0.2			5.1
	Furnace room		-0.2			0.0
	Basement bedroom	0.3	0			

Combustion Safety Testing Results

House ID	Depressurization (Pa)	Spillage	Comments
BC01	0.0	no	
BC02	2.5	no	
BC03	6.5	no	mid efficient
BC04	3.0	N Avail	
BC05	3.0	no	
BC06	1.1	no	
BC07	6.5	N Avail	
BC08	1.4	no	
BC09	4.5	N Avail	
BC10	5.0	no	
BC11	0.0	no	
BC12	N Avail	N Avail	too gusty to test
ON01	2.0	N Avail	
ON02	2.0	N Avail	
ON03	6.5	no	
ON04	4.5	no	power vented
ON05	2.0	no	
ON06	5.0	no	
ON07	9.0	no	electric furnace
ON08	0.0	no	
ON09	2.0	no	
ON10	2.5	no	
ON11	2.0	no	
ON12	4.0	N App	electric furnace
PQ01	0.0	no	
PQ02	7.5	yes	
PQ03	4.0	yes	
PQ04	5.0	yes	
MB01	8.0	no	power vented
MB02	0.5	no	
MB03	1.0	no	
MB04	4.0	no	
MB05	N App	N App	no exhaust devices
MB06	3.5	yes	
MB07	5.5	no	power vented
MB08	2.0	no	
MB09	2.0	no	
MB10	5.0	no	power vented
MB11	21.0	yes	central vac.
MB12	5.0	no	
NS01	10.5	N Avail	
NS02	7.0	N Avail	
NS03	11.0	N Avail	
NS04	9.5	N Avail	
NS05	8.0	N Avail	
NS06	10.0	N Avail	
NS07	1.5	N Avail	
NS08	7.0	yes	
NS09	4.0	N Avail	
NS10	1.0	N Avail	
NS11	N App	N App	no exhaust devices
NS12	0.5	N Avail	

Wood Moisture Results with related Room Temperature RH Data

House ID	Room Air Temp (°C)		Room Relative Humidity (%)			Wood Moisture Level %
	Basement/ Crawlspace	First Fl	Basement/ Crawlspace	First Fl	Ave bsmt RH for group	
MB08	19.5	21.4	18	18	31	<6
ON03	18	19.5	20	20	range	<6
ON10	19	23	22	19	18 to 52	<6
ON12	17.8	20	27	29		<6
ON04	20.2	20.5	27	29		<6
PQ04	20.4	19.9	32	37		<6
BC11			38	38		<6
MB02	15.8	18.9	41	40		<6
BC03	19	19	52	56		<6
MB07	18.5	21.3	20	16	29	6.5
MB09	14.5	20.3	27	38	range	6.25
NS08		20.6	29	28	20 to 36	6.25
NS02	18.3	19.9	31	32		6
MB11	20.5	22.4	32	31		6.25
MB06	15.3	19.8	36	36		6.5
MB10	17	21.5	16	25	26	7
ON09	19.3	20.4	17	20	range	7
NS04	21	21.7	20	20	16 to 35	7
ON07	15.4	18.2	21	18		7
MB05	18	20	23	29		7.25
NS01	15.2	22.9	23	17		7.75
MB12	18.8	20	25	24		7.25
NS12	15.6	16.9	28	31		7
NS05	20.8	23	29	25		7.5
NS11	20	20.8	30	33		7
MB01	17.3	20.9	34	31		7.25
MB03	16.5	17.8	34	23		7.25
NS03	18.1	20.2	35	31		7.25
NS09	13.5	19	35	33		7.75
ON08	20.8	18.9	26	29	39	8
BC12			33	34	range	8
PQ03	19.3	19.7	36	39	26 to 52	8
MB04	19.3	20.2	49	42		8.75
ON11	18.1	21.5	52	34		8.5
ON05	10.5	19.4	16	9	44	9
ON06	18.7	20	21	22	range	9
NS06	17.3	18.4	41	36	16 to 65	9.25
BC10	17	17.2	58	54		9
BC02	14, 10	19	62	50		9
BC04	17	21	65	51		9
NS10	15.3	19.3	36	33	36	10.75
BC01	18.5	19.6	40	34	40	12
BC06	14	16	66	54	66	14
BC09	14.5	23	72	47	72	17

House ID	Basement					First Floor					Second Floor					Third Floor			
	Room Temp.	Wall Temperatures (°C) N	E	S	W	Room Temp.	Wall Temperatures (°C) N	E	S	W	Room Temp.	Wall Temperatures (°C) N	E	S	W	Room Temp.	Wall Temperatures (°C) N	E	S
BC01	18.5	19.0		19.2, 17.0		19.6	17.5, 16.3		17.0	17.5	20.5	17.5			20.5, 21.0				
BC02	14.0, 10.0					19.0	18.3	19.2, 18.0		19.6									
BC03	19.0					19.0		20.5, 20.0		20.9	19.7			20.4, 20.7	20.3				
BC04	17.0					21.0	23.0		21.5, 20.0		19.5								
BC05						20.4					20.4								
BC06	14.0					16.0	15.4		20.8	15.8, 15.9	15.0		15.5	17.8					
BC07						17.0	16.9, 18.5			17.0	17.2	17.8, 17.3			17.4				
BC08						19.2			20.0, 20.2	19.5	18.8	19.4		20.0					
BC09	14.5					23.0													
BC10	18.0					17.2	17.5	20.9	18.3, 17.8	18.2									
BC11			18.3		20.6		16.7	18.5		20.5, 19.3		18.3	17.7, 17.5						
BC12																			
ON01	20.0	18.8		20.2		21.7	18.8		20.6		20.6			19.5	19.2				
ON02	15.6			16.0		19.4			17.8		18.9			17.8					
ON03	18.0	17.0	16.2	17.0	16.8	19.5	19.1	19.0	19.8	19.5	20.4	18.8	19.0	19.8	19.0				
ON04	20.2	22.6	20.7	21.2	21.0	20.5	20.4	20.2	18.9	19.5	20.4	20.0	20.0	20.3	20.3				
ON05	10.5	9.3	9.6	10.9	9.5	19.4	17.1	17.7	17.1	16.6	18.8	17.6	17.7	17.5	16.8	16.3	13.4	14.9	15.2
ON06	18.7	18.7	19.7	18.3	18.5	20.0	21.7	21.4	19.0	19.3	20.4	20.3	20.5	20.2	20.3				
ON07	15.4	14.7	14.9	14.9	14.5	18.2	17.6	18.7	18.7	20.1	19.1	17.7	18.3	19.7	18.0				
ON08	20.8	20.4	20.2	18.8	20.8	18.9	18.1	18.2	18.9	18.2	18.8	17.3	17.2	17.4	17.8				
0N09	19.3	17.9	18.1	18.5	18.6	20.4	18.0	19.5	19.4	18.1	20.8	19.7	20.6	20.8	20.0				
ON10	19.0	10.7	13.8	10.8	10.8	23.0	19.1	19.8	19.4	19.2	22.4	18.9	18.6	16.9	17.5				
ON11	18.1	16.6	17.2	18.1	15.0	21.5	18.1		18.7	19.1	19.7	18.6	18.9	18.8					
ON12	17.8	16.9	17.5	17.2	17.3	20.0	18.9	19.5	18.3	18.2	18.6	18.1	17.9	17.2	18.7				

House ID	Basement					First Floor					Second Floor					Third Floor			
	Room Temp.	Wall Temperatures (°C) N	E	S	W	Room Temp.	Wall Temperatures (°C) N	E	S	W	Room Temp.	Wall Temperatures (°C) N	E	S	W	Room Temp.	Wall Temperatures (°C) N	E	S
PQ01																			
PQ02																			
PQ03	19.3	16.7	17.2	16.4	18.0	19.7	18.2	17.8	17.8	17.5									
PQ04	20.4	20.7	21.1	20.8	20.1	19.9	19.3	20.1	19.6	19.7									
MB01	17.3	11.0			17.0, 9.0	20.9	18.0	18.0, 17.0	18.0										
MB02	15.8	14.0		14.0		18.9	17.0, 18.0	16.0			17.5	15.0		15.0					
MB03	16.5	15.0	14.0	9.0	15.0	17.8	17.0	19.0	18.0	18.0	23.2	18.0, 19.0	18.0, 19.0	18.0	17.0				
MB04	19.3	13,1.0	17.0	17.0, 16.0	15.0, 1.0	20.2	16.0	21.0, 19.0	16.0	14.0, 17.0									
MB05	18.0	19.0	19.0		18.0	20.0	18.0, 17.0	17.0	17.0, 19.0										
MB06	15.3	14.0	15.0	15.0	15.0, 1.0	19.8	18.0	19.0, 18.0	18.0	18.0									
MB07	18.5	17.0	17.0, 15.0	17.0		21.3	21.0, 22.0	21.0	21.0	22.0	23.8	22.0	22.0, 23.0	23.0	22.0, 23.0				
MB08	19.5	23,2	25.0	23.0, 25.0	23.0	21.4				25.0	20.5								
MB09	14.5	12.0			14.0	20.3	21.0		19.0	20.0	20.9	17.5, 18.0	20.0	20.0					
MB10	17.0					21.5	16.0	17.0		17.0	21.5	17.0	17.0						
MB11	20.5	20.0	20.0	20.0	20.0	22.4	21.0	19.0	21.0, 17.0	21.0									
MB12	18.8	17.5	17.5	17.5	17.5	20.0	18.0	18.0	17.5	18.0	19.8	17.0	18.0, 20.0		18.0				
NS01	15.2	14.0	13.8	14.5	7.7	22.9	22.2	17.4	18.1	15.5		14.0	17.9	15.0	17.6				
NS02	18.3	17.2	17.7	18.3	15.0	19.9	18.1, 17.9	19.2	19.9, 20.5	19.8									
NS03	18.1	17.5, 1.0	18.4, 18.0	18.9, 18.0	18.0	20.2	16.1	16.1, 19.0	17.3	18.9	18.6	18.3	19.0	17.4, 17.7	16.4				
NS04	21.0	20.5	21.0		23.9	21.7	19.7	20.6, 20.0	20.1	22.6, 23.6									

House ID	Basement					First Floor					Second Floor					Third Floor			
	Room Temp.	Wall Temperatures (°C) N	E	S	W	Room Temp.	Wall Temperatures (°C) N	E	S	W	Room Temp.	Wall Temperatures (°C) N	E	S	W	Room Temp.	Wall Temperatures (°C) N	E	S
NS05	20.8	20.0	20.0	20.0	20.0	23.0	21.9	21.8	22.2	22.2	21.4	21.0	23.0	20.9, 19.4	19.3				
NS06	17.3		17.1	18.1		18.4	18.2	18.5	19.2	17.7	20.1	20.3	19.2	19.4	19.5				
NS07	16.9	15.8		14.5	16.9, 1.0	20.0	19.6	18.8	19.2	19.9	19.4	19.0	19.1	19.5	17.5, 18.4				
NS08		20.6	19.5	20.1	19.1	20.6	20.8	20.9, 21.0	21.2	21.0	21.7								
NS09	13.5	10.7	11.6	10.7	10.7	19.0	17.9	18.2	18.0	18.6									
NS10	15.3	16.0	16.0	18.7	16.0	19.3	20.9	20.9	18.2, 19.6	22.9	18.1	19.7	20.2	20.1	20.3				
NS11	20.0	18.6, 1.0		18.9	17.4	20.8	17.7	19.3	17.8	17.8									
NS12	15.6		11.7			16.9	19.4	15.8	18.5	16.4	17.5	16.3	16.4	17.5	16.8				

Thermostat and Furnace Test Data

House ID	Thermostat Start Temp. Error (°C)	Thermostat Stop Temp. Error (°C)	Actual Temp. Range (°C)	Thermostat Temp. Range (°C)	Thermostat Range Error (°C)	Furnace Cycle Time (min.)	Comments
BC01	-0.5	-2.3	1.8	0.0	-1.8	16	Slow response
BC02	-1.5	-1.6	0.6	0.5	-0.1	3.35	
BC03	1.3	1.2	0.5	0.4	-0.1	5.54	
BC04	-1.8	-1.9	1.6	1.5	-0.1	16.3	Forced cycle
BC05	-2.2	-1.6	0.4	1.0	0.6	7	
BC06	0.3	-1.9	5.5	3.3	-2.2	31	Fridge warmed t'stat
BC07	0.3	-0.4	0.9	0.2	-0.7	2.18	Slow response
BC08	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail	Never cycled
BC09	N Avail	-4.3	2.6	N Avail	N Avail	15.1	Forced cycle
BC10	-0.8	-0.5	5.2	5.5	0.3	39	
BC11	-1.4	-2.3	2.9	2.0	-0.9	22.57	Electronic
BC12	-1.5	-2.1	1.6	1.0	-0.6	15.4	T'stat setting moved
ON01	-0.3	-1.9	2.4	0.8	-1.6	7	
ON02	-0.1	N Avail	N Avail	N Avail	N Avail	N Avail	Forced on
ON03	0.0	-0.5	3.0	2.5	-0.5	35.5	
ON04	N Avail	N Avail	0.3	N Avail	N Avail	3	Electronic
ON05	N Avail	N Avail	0.1	N Avail	N Avail	10.41	Electronic
ON06	N Avail	N Avail	0.3	N Avail	N Avail	3.45	Electronic
ON07	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail	HRV,F/P prevented cycl
ON08	0.2	1.1	0.1	1.0	0.9	5	
ON09	-0.7	-0.3	0.1	0.5	0.4	2	
ON10	0.1	-1.1	3.5	2.3	-1.2	15	
ON11	-1.6	-1.3	0.7	1.0	0.3	10.45	
ON12	N Avail	N Avail	N Avail	N Avail	N Avail	N Avail	Heat pump on same t'sta
PQ01	0.2	-0.5	0.7	0.0	-0.7	3	
PQ02	-0.4	-0.5	0.1	0.0	-0.1	6.5	
PQ03	1.8	0.4	3.6	2.2	-1.4	25	Forced cycle
PQ04	0.3	-1.0	1.8	0.5	-1.3	10	
MB01	0.0	-0.5	1.5	1.0	-0.5	6	
MB02	0.0	-0.5	2.0	1.5	-0.5	2	
MB03	-2.0	-5.5	6.5	3.0	-3.5	12.5	
MB04	-1.0	-1.5	1.0	0.5	-0.5	4	
MB05	-2.4	N Avail	3.3	N Avail	N Avail	7	
MB06	-1.0	-1.0	1.0	1.0	0.0	4	
MB07	0.3	-1.5	3.5	1.7	-1.8	19	
MB08	-2.0	-2.7	1.8	1.1	-0.7	8	
MB09	N Avail	1.5	N Avail	N Avail	N Avail	6	Gnd water heat pump
MB10	1.1	-0.4	1.5	0.0	-1.5	9	
MB11	-2.0	-3.5	2.5	1.0	-1.5	5	
MB12	2.2	1.2	1.0	0.0	-1.0	4	
NS01	3.1	0.7	4.1	1.7	-2.4	31	Possible forced cycle
NS02	0.6	N Avail	N Avail	N Avail	N Avail	7	
NS03	-0.7	-1.5	2.8	2.0	-0.8	19	
NS04	-0.5	-2.0	3.1	1.6	-1.5	48	
NS05	0.0	0.1	0.9	1.0	0.1	N Avail	Constant wood-fired
NS06	0.3	0.8	0.5	1.0	0.5	18	
NS07	-1.4	-1.0	0.6	1.0	0.4	7	
NS08	0.9	-2.6	4.0	0.5	-3.5	3	
NS09	0.8	-4.5	6.7	1.4	-5.3	12	
NS10	0.4	-2.2	4.6	2.0	-2.6	8	
NS11	N Avail	-1.4	2.8	N Avail	N Avail	11	
NS12	-0.6	-0.8	0.3	0.1	-0.2	7	

Homeowners' Airtightness Estimates

House ID	ELA (cm^2)	NLA (cm^2/m^2)	AC/H @ 50 Pa	Test Category	Homeowner's Category	
BC01	6443.4	5.70	14.4	Leaky	Leaky	
BC02	1510.4	3.52	9.8	Leaky	Leaky	
BC03	1041.5	2.12	3.2	Average	Tight	
BC04	3959.5	5.89	9.3	Leaky	Leaky	
BC05	2210.9	5.21	10.0	Leaky	Average	Semi-detached tested without depressurizing other unit
BC06	1472.2	3.43	6.0	Leaky	Leaky	
BC07	1305.9	3.21	7.1	Leaky	Leaky	
BC08	2092.9	3.58	6.1	Leaky	Leaky	
BC09	914.6	2.59	6.6	Leaky	Average	
BC10	1363.7	3.29	7.4	Leaky	Average	
BC11	3858.6	6.77	11.8	Leaky	Leaky	
BC12	N Avail	N Avail	N Avail	N Avail	Tight	Not tested due to winds
ON01	1657.5	3.23	8.0	Leaky	N Avail	
ON02	1227.3	2.46	5.5	Leaky	N Avail	
ON03	787.9	1.80	4.1	Average	Tight	
ON04	969.8	2.15	4.5	Average	Average	
ON05	2784.1	5.46	10.6	Leaky	Leaky	
ON06	612.4	1.13	2.5	Tight	Average	
ON07	353.3	0.53	1.1	Tight	Tight	R-2000 airtightness
ON08	458.0	1.39	3.6	Average	Average	
ON09	1260.7	2.78	6.1	Leaky	Average	
ON10	1630.9	4.58	11.7	Leaky	N Avail	
ON11	570.9	1.41	3.4	Average	Average	
ON12	523.6	0.99	2.5	Tight	Leaky	
PQ01	718.3	1.96	4.9	Average	N Avail	
PQ02	538.9	1.73	4.2	Average	N Avail	
PQ03	540.8	1.34	3.5	Average	Tight	
PQ04	689.2	1.85	4.2	Average	N Avail	
MB01	960.2	1.90	3.9	Average	N Avail	
MB02	842.9	2.37	5.4	Leaky	Average	
MB03	984.6	3.23	6.1	Leaky	Average	
MB04	567.4	0.67	3.4	Average	Average	
MB05	512.2	1.49	4.0	Average	Average	
MB06	425.0	1.07	3.0	Tight	Average	
MB07	945.5	1.55	3.6	Average	Average	
MB08	1213.0	1.44	4.3	Average	N Avail	
MB09	1339.7	1.95	4.0	Average	N Avail	
MB10	640.4	0.96	2.3	Tight	Average	
MB11	197.0	0.50	1.4	Tight	Average	R-2000 airtightness
MB12	335.3	0.44	0.8	Tight	N Avail	
NS01	1121.0	3.17	6.5	Leaky	Leaky	
NS02	1301.0	3.09	6.6	Leaky	Leaky	
NS03	540.0	1.37	2.5	Tight	Tight	
NS04	1354.0	2.41	5.4	Leaky	Average	
NS05	1310.0	2.52	4.5	Average	Leaky	
NS06	749.0	1.27	2.7	Tight	Average	
NS07	1963.0	2.84	5.8	Leaky	Tight	Part of 2nd Fl. (apt) closed from rest of house for this test
NS08	406.0	1.23	2.7	Tight	Tight	
NS09	1050.0	2.68	5.5	Leaky	N Avail	
NS10	2457.0	4.63	10.5	Leaky	Leaky	
NS11	670.0	1.63	4.0	Average	Average	
NS12	2076.0	4.10	12.2	Leaky	Leaky	

Homeowner Perceptions of House Humidity

House ID	Perceived Spring Humidity	Perceived Summer Humidity	Perceived Fall Humidity	Perceived Winter Humidity	First Floor RH (%)
BC01	Average	Average	Average	Dry	34
BC02	Average	Average	Average	Average	50
BC03	Average	Average	Average	Dry	56
BC04	Average	Average	Average	Dry	51
BC05	N/Avail	Average	Average	Dry	54
BC06	Humid	N/Avail	Humid	Dry	54
BC07	Humid	Humid	Humid	Humid	54
BC08	N/Avail	N/Avail	Average	Dry	58
BC09	N/Avail	N/Avail	N/Avail	N/Avail	47
BC10	Average	Average	Average	Dry	54
BC11	Average	Average	Average	Average	38
BC12	Average	Average	Average	Dry	34
ON01	N/Avail	N/Avail	N/Avail	N/Avail	37
ON02	N/Avail	N/Avail	N/Avail	N/Avail	41
ON03	Average	Average	Average	Average	20
ON04	Average	Average	Average	Average	29
ON05	Humid	Average	Humid	Dry	9
ON06	Average	Humid	Average	Average	22
ON07	Average	Average	Average	Dry	18
ON08	Humid	Average	Average	Average	29
ON09	Average	Average	Average	Dry	20
ON10	Average	Average	Dry	Dry	19
ON11	Average	Average	Average	Dry	34
ON12	N/Avail	Humid	Average	Average	29
PQ01	N/Avail	N/Avail	N/Avail	N/Avail	47
PQ02	N/Avail	N/Avail	N/Avail	N/Avail	41
PQ03	Average	Average	Average	Dry	39
PQ04	Average	Average	Average	Dry	37
MB01	Average	Average	Average	Average	31
MB02	Average	Average	Average	Dry	40
MB03	Average	Average	Average	Dry	23
MB04	Average	Average	Average	Dry	42
MB05	Average-Humid	Average	Average-Humid	Average	29
MB06	Dry-Average	Humid	Dry-Average	Dry-Average	36
MB07	Average	Average	Average	Average	16
MB08	Average	Average	Average	Dry	18
MB09	N/Avail	N/Avail	Average	Dry	38
MB10	Average	Average	Average	Average	25
MB11	Average	Average	Average	Average	31
MB12	Average	Average	Average	Average	24
NS01	Average	Average	Average	Average	17
NS02	Aveage	Humid	Average	Dry	32
NS03	N/Avail.	N/Avail.	N/Avail.	Dry	31
NS04	Average	Humid	Average	Dry-Average	20
NS05	Average	Average	Average	Average	25
NS06	N/Avail.	N/Avail.	N/Avail.	Dry-Average	36
NS07	Dry	Average	Average	Dry	29
NS08	Average	Average	Average	Dry	28
NS09	Humid	Average	Humid	Humid	33
NS10	Average-Humid	Humid	Dry-Average	Dry	33
NS11	Average	Average	Average	Average	33
NS12	N/Avail.	N/Avail.	N/Avail.	Dry	31