

## Air Change Summary –



Volume	13935	cu. ft
Floor Area	1859	sq. ft
Surface Area	4272	sq. ft
Height	17.8	ft.
# Bedrooms	2	
# Occupants	2	
Pre- and Post-Retrofit Blower Door Testing		
Historical Building	2016-02-26	5.45 ACH50
Post	2017-02-10	0.3 ACH50

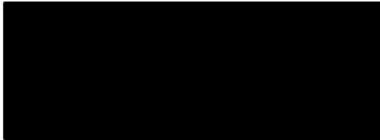
# BUILDING LEAKAGE TEST

PRE-

Date of Test: 26/02/2016

Test File: Mont1

Customer:



Technician:

Project Number: 1

Building Address:

## Test Results

- Airflow at 50 Pascals:  
(50 Pa = 0.2 w.c.)  
1266 CFM50 ( +/- 0.4 %)  
5.45 ACH50  
0.6812 CFM50/ft<sup>2</sup> floor area  
0.2964 CFM50/ft<sup>2</sup> surface area
- Leakage Areas:  
134.5 in<sup>2</sup> ( +/- 1.2 %) Canadian EqLA @ 10 Pa  
72.8 in<sup>2</sup> ( +/- 2.1 %) LBL ELA @ 4 Pa
- Building Leakage Curve:  
Flow Coefficient (C) = 106.8 ( +/- 3.3 %)  
Exponent (n) = 0.632 ( +/- 0.009 )  
Correlation Coefficient = 0.99936
- Test Settings:  
Test Standard: CGSB  
Test Mode: Depressurization

## Infiltration Estimates

- Estimated Average Annual Infiltration Rate:  
89.9 CFM  
0.39 ACH  
30.0 CFM per person  
(using bedrooms + 1)
- Estimated Design Infiltration Rate:  
Winter: 137.5 CFM      Summer: 96.9 CFM  
0.59 ACH                      0.42 ACH

## Cost Estimates

- Estimated Cost of Air Leakage for Heating:      \$ 146 per year heating
- Estimated Cost of Air Leakage for Cooling:

## Mechanical Ventilation Guideline (based on ASHRAE 62.2-2010)

Recommended Whole Bldg Rate:	42.3 CFM
Base Rate:	41.1 CFM
Supplemental Rate:	27.5 CFM
Infiltration Credit:	<26.3 CFM>

**BUILDING LEAKAGE TEST Page 2 of 4**

Date of Test: 26/02/2016 Test File: Mont1

Building Information		Location Climate Information	
Volume	13935	Ventilation Weather Factor	1.05
Surface Area	4272	Energy Climate Factor	17.00
Floor Area	1859	Heating Degree Days	10671
Height	17.8	Cooling Degree Days	217
# of Bedrooms	2	Design Winter Wind Speed	8.6 mph
# of Occupants	2	Design Summer Wind Speed	13.1 mph
Year of Construction	1947	Design Winter Temp Diff	94 deg F
Wind Shield	M	Design Summer Temp Diff	10 deg F

**Heating and Cooling Cost and Efficiency Information**

Heating Fuel	Gas
Heating Fuel Cost	\$0.83/ccf
Heating Efficiency %	91.00
Cooling Fuel Cost	\$0.089/kwh
Cooling SEER	

**Equipment Information**

Type	Manufacturer	Model	Serial Number	Custom Calibration Date
Fan	Energy Conservatory	Model 3 (110V)		-
Micromanometer	Energy Conservatory	DG700	31950-7	6/27/2011

**BUILDING LEAKAGE TEST Page 3 of 4**

Date of Test: 26/02/2016 Test File: Mont1

**Depressurization Test:**

**Environmental Data**

Indoor Temperature (°F)	Outdoor Temperature (°F)
67.0	28.0

**Data Points**

Nominal Building Pressure (Pa)	Baseline Adjusted Building Pressure (Pa)	Fan Pressure (Pa)	Nominal Flow (cfm)	Adjusted Flow (cfm)	% Error	Fan Configuration
-2.2	n/a	n/a				
-51.9	-50.1	52.3	1309	1260	-0.6	Ring A
-47.6	-45.8	46.7	1238	1192	-0.5	Ring A
-42.0	-40.2	40.6	1157	1113	1.0	Ring A
-36.8	-35.1	33.9	1059	1019	0.7	Ring A
-32.4	-30.6	28.4	972	935	0.8	Ring A
-27.4	-25.6	211.3	861	828	-0.1	Ring B
-22.2	-20.5	155.0	738	711	-1.3	Ring B
-16.9	-15.2	107.8	617	594	-0.3	Ring B
-1.4	n/a	n/a				

**Deviations from Standard CGSB - Test Parameters**

None

**BUILDING LEAKAGE TEST Page 4 of 4**

Date of Test: 26/02/2016 Test File: Mont1

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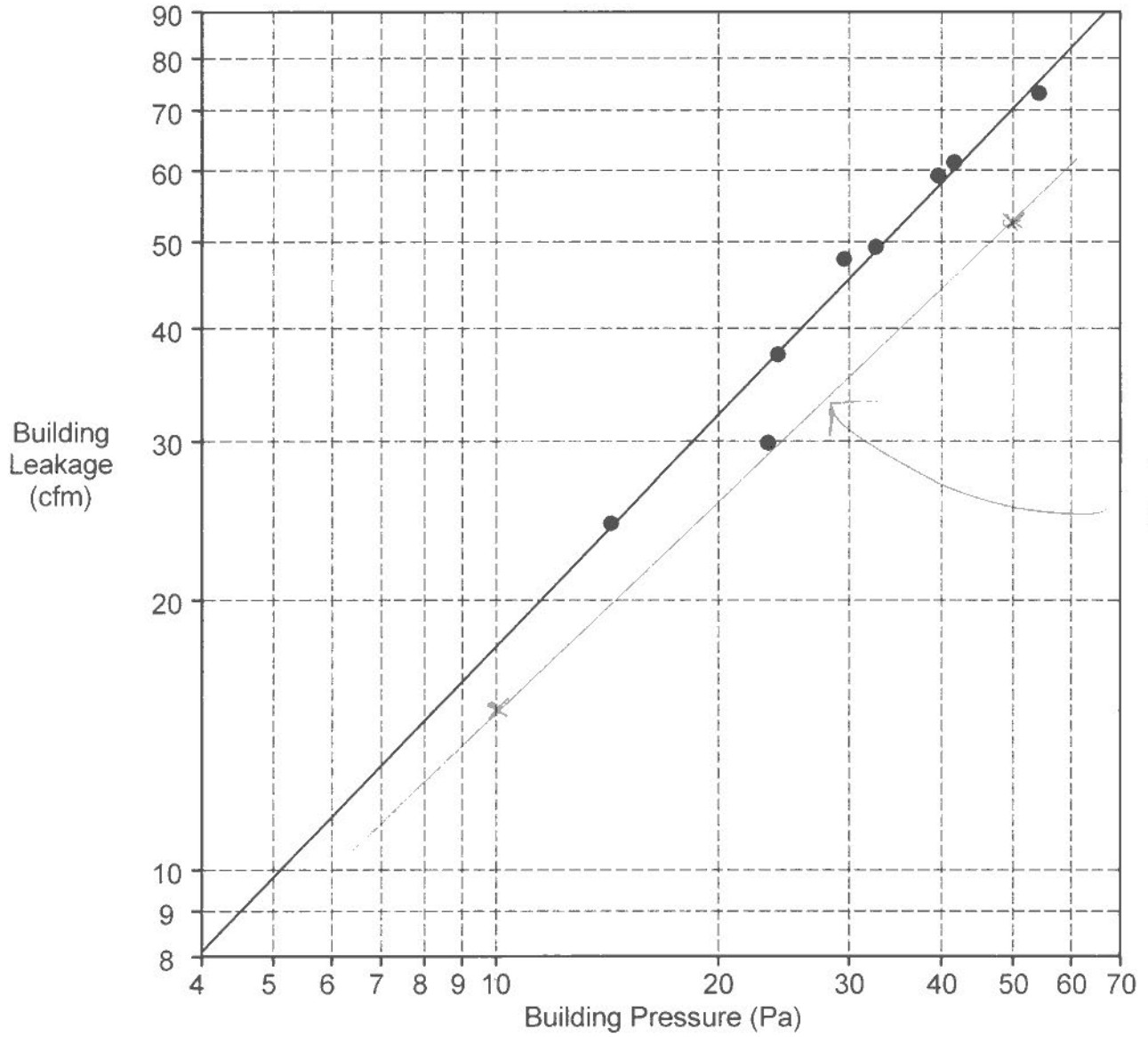
**Comments**

Montague pre-retrofit  
Starting roof retrofit, shingles off back roofs

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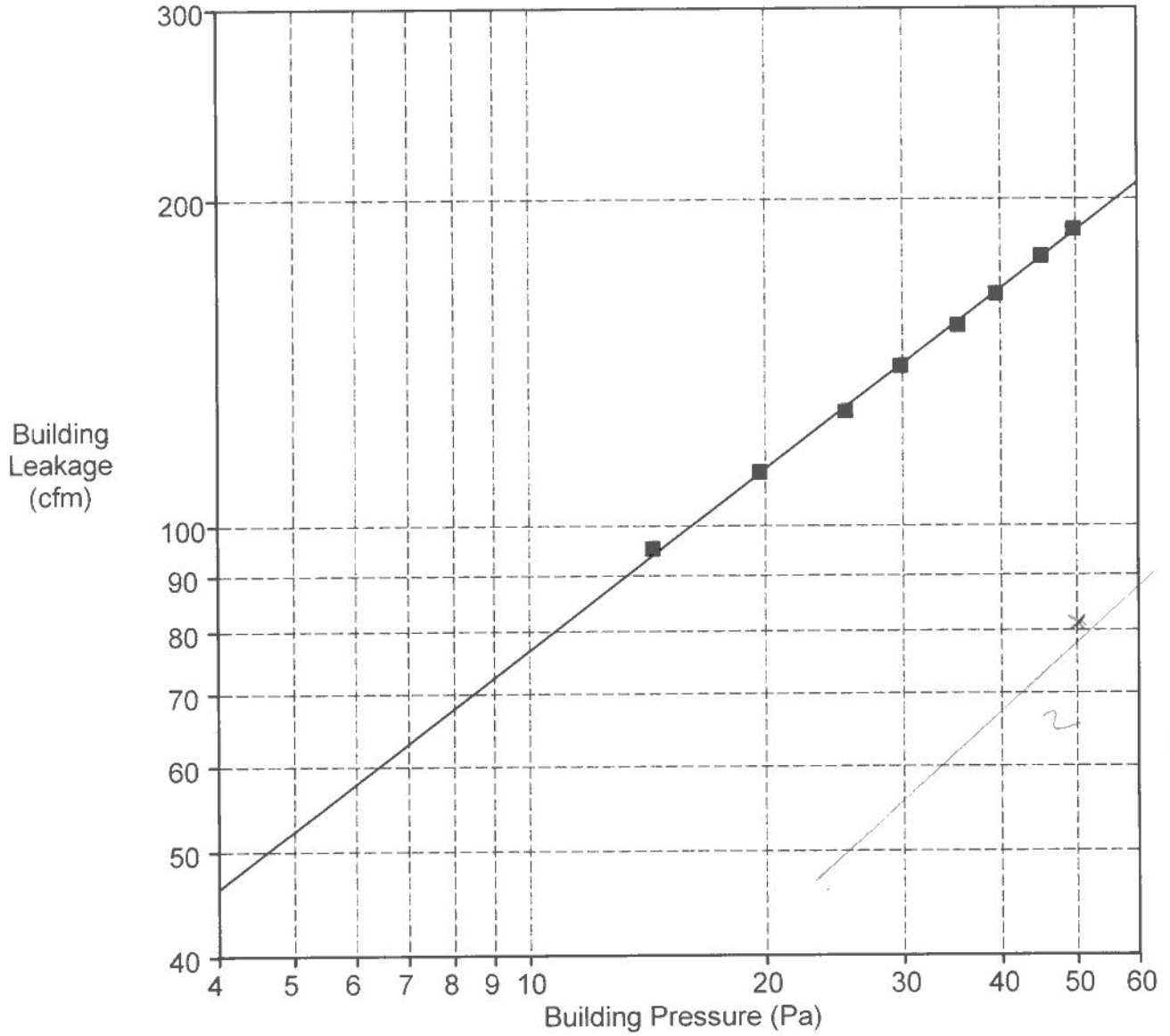
# Building Leakage Curve

Date of Test: 26-Feb-16 Test File: Mont2016Sep22DePressure



# Building Leakage Curve

Date of Test: 24-Sep-16 Test File: Mont2016Sep24Pressure

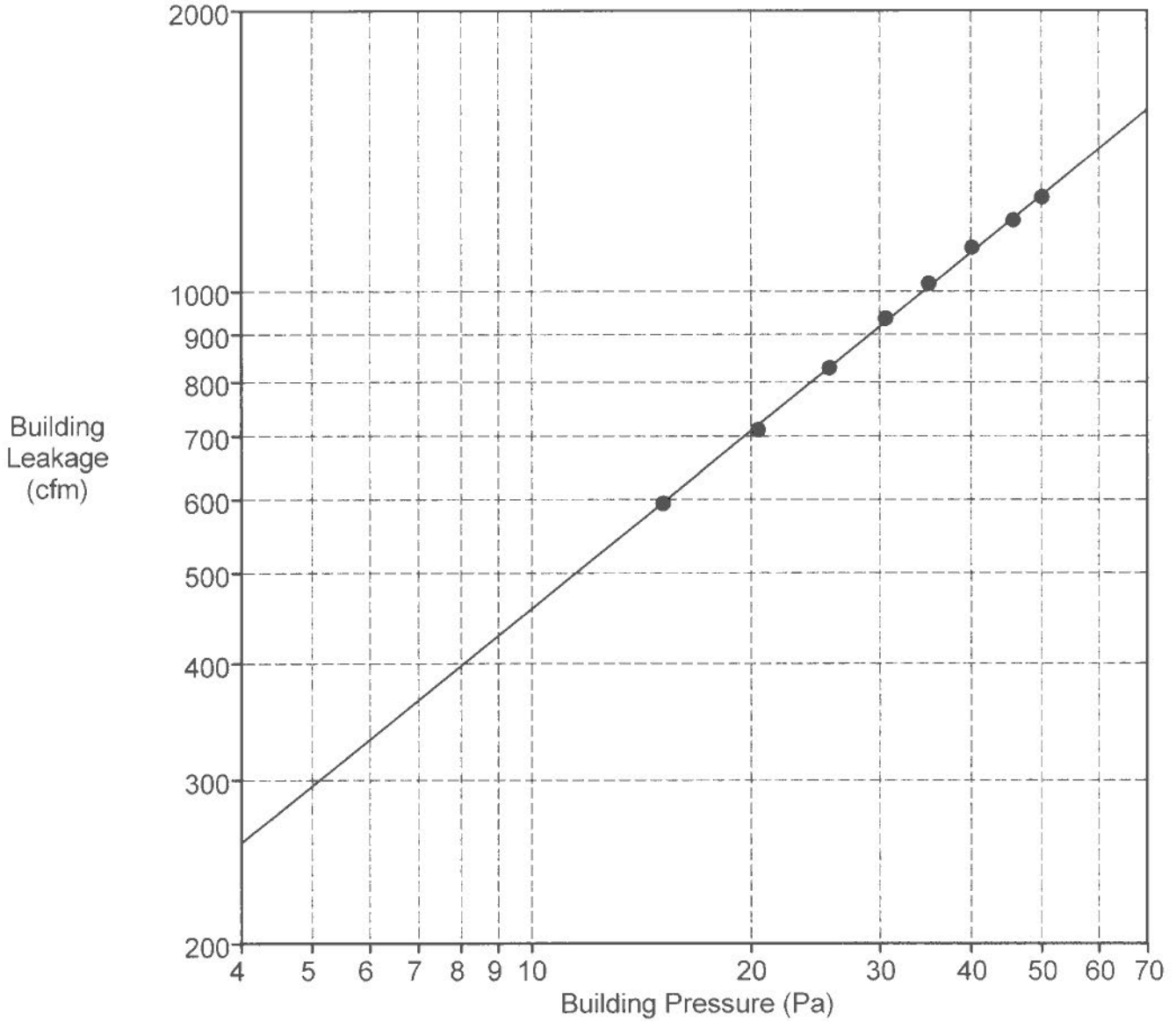


# Building Leakage Curve

BASELINE

De-Pressure

Date of Test: 26/02/2016 Test File: Mont1

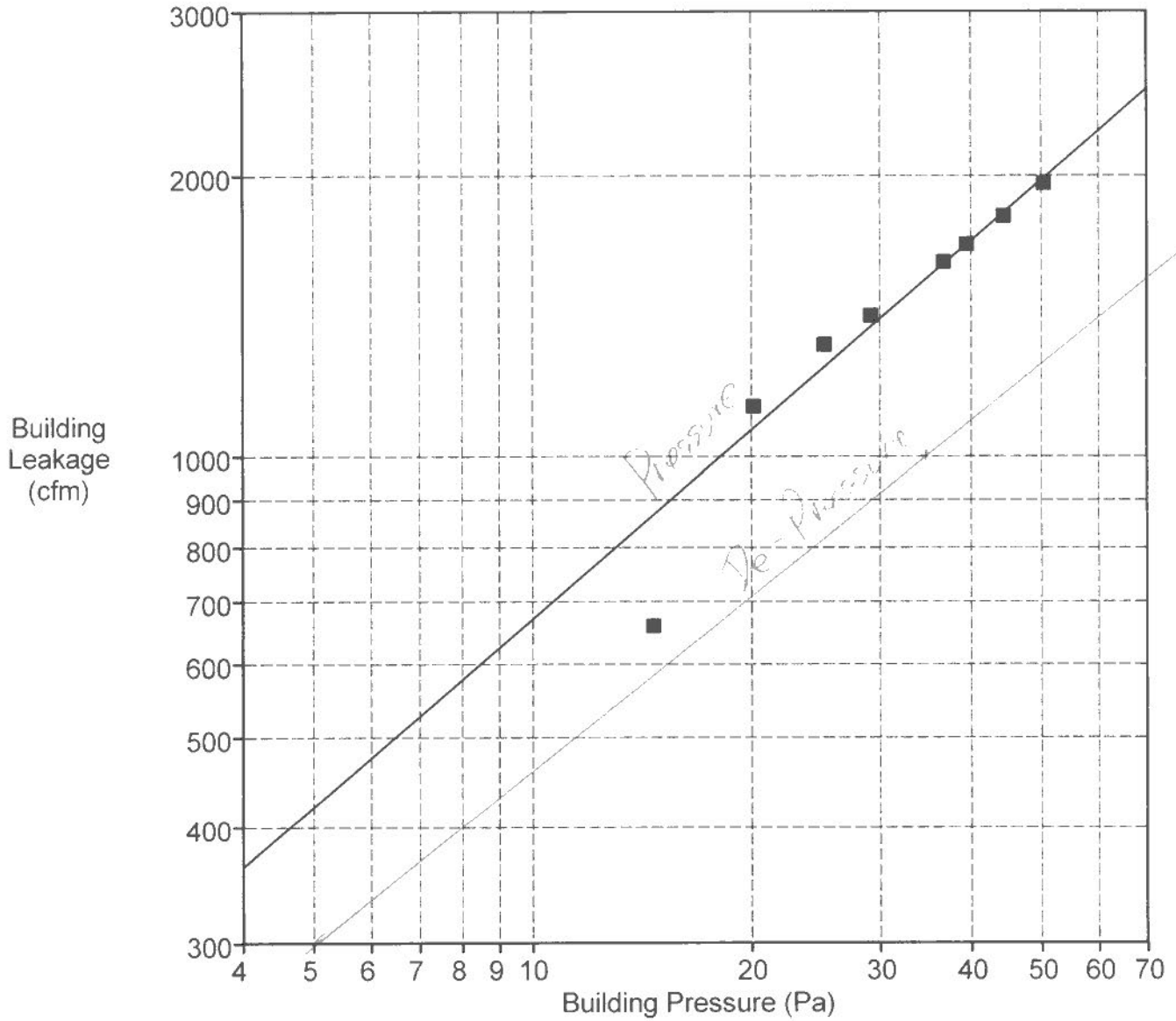




# Building Leakage Curve

*Baseline  
Pressure*

Date of Test: 26/02/2016 Test File: Mont1Pressure



## BUILDING LEAKAGE TEST

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Date of Test: 26/02/2016	Test File: Mont1Pressure
Customer: David Stregger	Technician:
547 Montague Ave	Project Number: 1
Winnipeg, MB R3L 1T9	Building Address:
Email: stregwpg@mts.net	

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### Test Results

- Airflow at 50 Pascals:  
(50 Pa = 0.2 w.c.)  
1980 CFM50 ( +/- 2.9 %)  
8.53 ACH50  
1.0653 CFM50/ft2 floor area  
0.4636 CFM50/ft2 surface area
  - Leakage Areas:  
197.1 in2 ( +/- 8.6 %) Canadian EqLA @ 10 Pa  
102.8 in2 ( +/- 14.5 %) LBL ELA @ 4 Pa
  - Building Leakage Curve:  
Flow Coefficient (C) = 142.6 ( +/- 23.5 %)  
Exponent (n) = 0.672 ( +/- 0.065 )  
Correlation Coefficient = 0.97294
  - Test Settings:  
Test Standard: CGSB  
Test Mode: Pressurization
- 

### Infiltration Estimates

- Estimated Average Annual Infiltration Rate:  
126.9 CFM  
0.55 ACH  
42.3 CFM per person  
(using bedrooms + 1)
  - Estimated Design Infiltration Rate:  
Winter: 194.3 CFM      Summer: 136.8 CFM  
0.84 ACH                      0.59 ACH
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### Cost Estimates

- Estimated Cost of Air Leakage for Heating:      \$ 229 per year heating
  - Estimated Cost of Air Leakage for Cooling:
- 

### Mechanical Ventilation Guideline (based on ASHRAE 62.2-2010)

Recommended Whole Bldg Rate:	23.7 CFM
Base Rate:	41.1 CFM
Supplemental Rate:	27.5 CFM
Infiltration Credit:	<44.9 CFM>

## BUILDING LEAKAGE TEST Page 2 of 4

Date of Test: 26/02/2016 Test File: Mont1Pressure

### Building Information

Volume	13935
Surface Area	4272
Floor Area	1859
Height	17.8
# of Bedrooms	2
# of Occupants	2
Year of Construction	1947
Wind Shield	M

### Location Climate Information

Ventilation Weather Factor	1.05
Energy Climate Factor	17.00
Heating Degree Days	10671
Cooling Degree Days	217
Design Winter Wind Speed	8.6 mph
Design Summer Wind Speed	13.1 mph
Design Winter Temp Diff	94 deg F
Design Summer Temp Diff	10 deg F

### Heating and Cooling Cost and Efficiency Information

Heating Fuel	Gas
Heating Fuel Cost	\$0.83/ccf
Heating Efficiency %	91.00
Cooling Fuel Cost	\$0.089/kwh
Cooling SEER	

### Equipment Information

Type	Manufacturer	Model	Serial Number	Custom Calibration Date
Fan	Energy Conservatory	Model 3 (110V)		-
Micromanometer	Energy Conservatory	DG700	31950-7	6/27/2011

**BUILDING LEAKAGE TEST Page 3 of 4**

Date of Test: 26/02/2016 Test File: Mont1Pressure

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**Pressurization Test:**

**Environmental Data**

Indoor Temperature (°F)	Outdoor Temperature (°F)
68.0	28.0

**Data Points**

Nominal Building Pressure (Pa)	Baseline Adjusted Building Pressure (Pa)	Fan Pressure (Pa)	Nominal Flow (cfm)	Adjusted Flow (cfm)	% Error	Fan Configuration
-1.6	n/a	n/a				
48.8	50.5	110.5	1885	1961	-1.6	Ring A
42.6	44.3	93.9	1741	1811	-0.8	Ring A
37.8	39.5	81.1	1621	1686	-0.2	Ring A
35.0	36.7	74.1	1551	1613	0.3	Ring A
27.5	29.2	56.4	1358	1413	2.5	Ring A
23.5	25.2	48.8	1266	1317	5.5	Ring A
18.5	20.2	35.7	1086	1130	5.1	Ring A
13.0	14.6	113.8	634	659	-24.0	Ring B
-1.8	n/a	n/a				

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**Deviations from Standard CGSB - Test Parameters**

- Correlation coefficient (0.973) outside of acceptable limits.
  - % Error for one or more of the data test points is greater than 6%.
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**BUILDING LEAKAGE TEST Page 4 of 4**

Date of Test: 26/02/2016 Test File: Mont1Pressure

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**Comments**

Montague pre-retrofit  
Starting roof retrofit, shingles off back roofs

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# BUILDING LEAKAGE TEST

*POST*

*Source profile*

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Date of Test: 26-Feb-16      Test File: Mont2016Sep22DePressure  
Customer: David Stregger      Technician:  
547 Montague Ave      Project Number: 1  
Winnipeg, MB R3L 1T9  
Email: stregwpg@mts.net      Building Address:

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## Test Results

- Airflow at 50 Pascals:      70 CFM50 ( +/- 2.9 %)  
(50 Pa = 0.2 w.c.)      0.30 ACH50  
   0.0378 CFM50/ft2 floor area  
   0.0165 CFM50/ft2 surface area
  - Leakage Areas:      5.2 in2 ( +/- 9.3 % ) Canadian EqLA @ 10 Pa  
   2.3 in2 ( +/- 15.5 % ) LBL ELA @ 4 Pa
  - Building Leakage Curve:      Flow Coefficient (C) = 2.5 ( +/- 25.0 % )  
   Exponent (n) = 0.855 ( +/- 0.069 )  
   Correlation Coefficient = 0.98128
  - Test Settings:      Test Standard: CGSB  
   Test Mode: Depressurization
- 

## Infiltration Estimates

- Estimated Average Annual Infiltration Rate:      2.8 CFM  
   0.01 ACH  
   0.9 CFM per person  
   (using bedrooms + 1)
  - Estimated Design Infiltration Rate:      Winter: 4.3 CFM      Summer: 3.1 CFM  
   0.02 ACH      0.01 ACH
- 

## Cost Estimates

- Estimated Cost of Air Leakage for Heating:      \$ 8 per year heating
  - Estimated Cost of Air Leakage for Cooling:
- 

## Mechanical Ventilation Guideline (based on ASHRAE 62.2-2010)

Recommended Whole Bldg Rate:      68.6 CFM  
Base Rate:      41.1 CFM  
Supplemental Rate:      27.5 CFM  
Infiltration Credit:      <0.0 CFM>

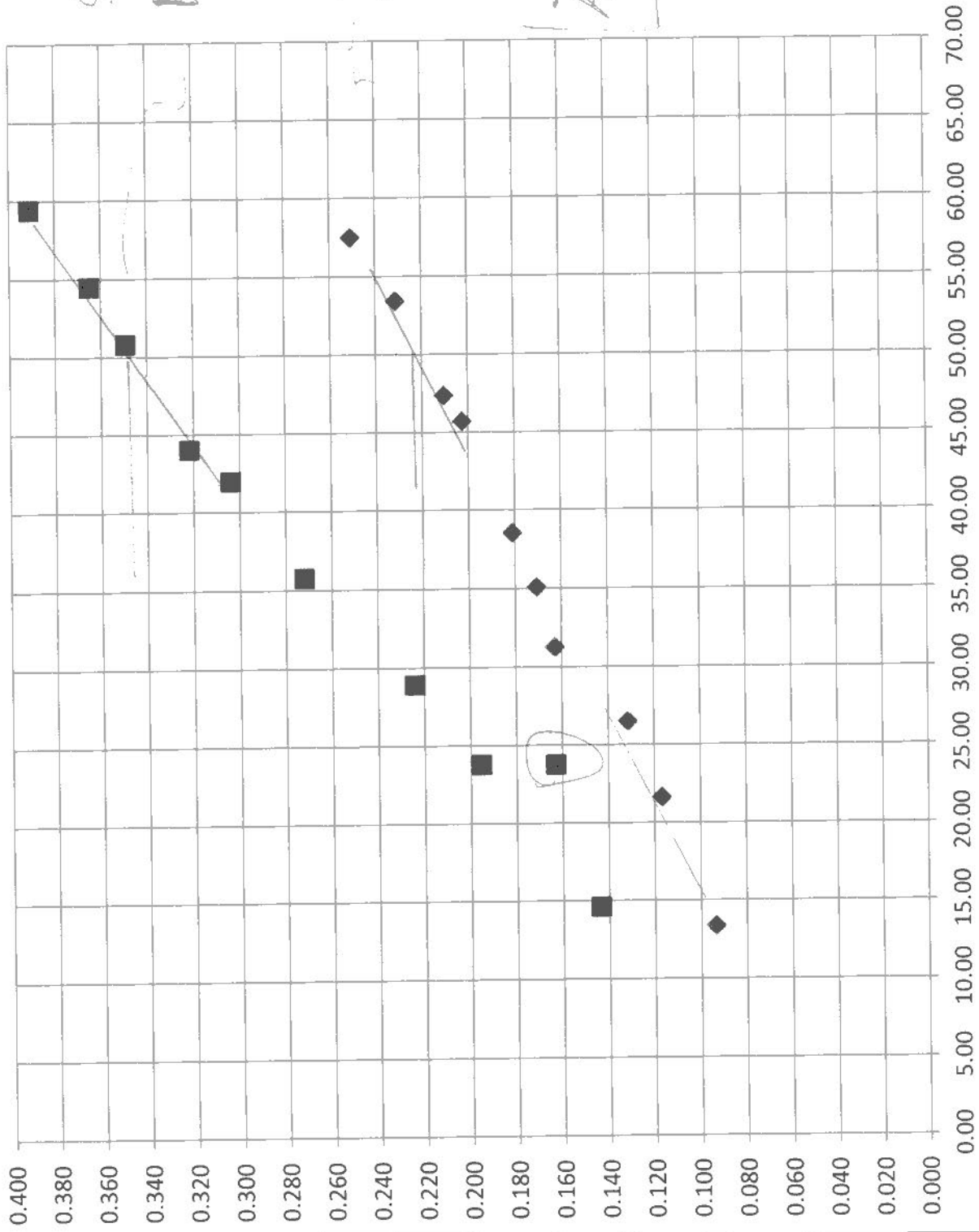
*← Move Ventilation w/o Leakage*

Montague stats	394.60 m <sup>3</sup>	Volume
	172.70 m <sup>2</sup>	Floor Area
	396.90 m <sup>2</sup>	Surface Area

	Pa	L/s	cfm equivalent
Test3 below			2.12
	-53.39	25.37	53.76
	-57.43	27.50	58.27
	-47.33	23.08	48.90
	-45.67	22.22	47.08
	-38.49	19.85	42.06
	-35.05	18.71	39.64
	-31.23	17.86	37.84
	-26.46	14.41	30.53
	-21.60	12.81	27.14
	-13.33	10.26	21.74
	50.00	24.24	
	10.00	7.74	
	10.00	30.51 cm <sup>2</sup>	
	4.00	15.22 cm <sup>2</sup>	
	-48.50	0.23 ACH	
	-58.70	0.27 ACH	
	-54.80	0.25 ACH	

	Pa	L/s	cfm equivalent
Test2 below			
	59.35	42.90	90.90
	54.43	40.03	84.82
	50.75	38.31	81.17
	43.95	35.29	74.78
	41.90	33.34	70.64
	35.71	29.83	63.21
	28.86	24.60	52.12
	23.74	21.42	45.39
	<b>23.71</b>	17.86	37.84
	14.55	15.75	33.37
	50.00	37.87	
	10.00	10.87	
	10.00	43.73 cm <sup>2</sup>	
	4.00	20.75 cm <sup>2</sup>	
	50.30	0.35	
	58.10	0.37	

# 547 Montague Blower Door (2017-02-10)



Slope 0.395

D = 0.397

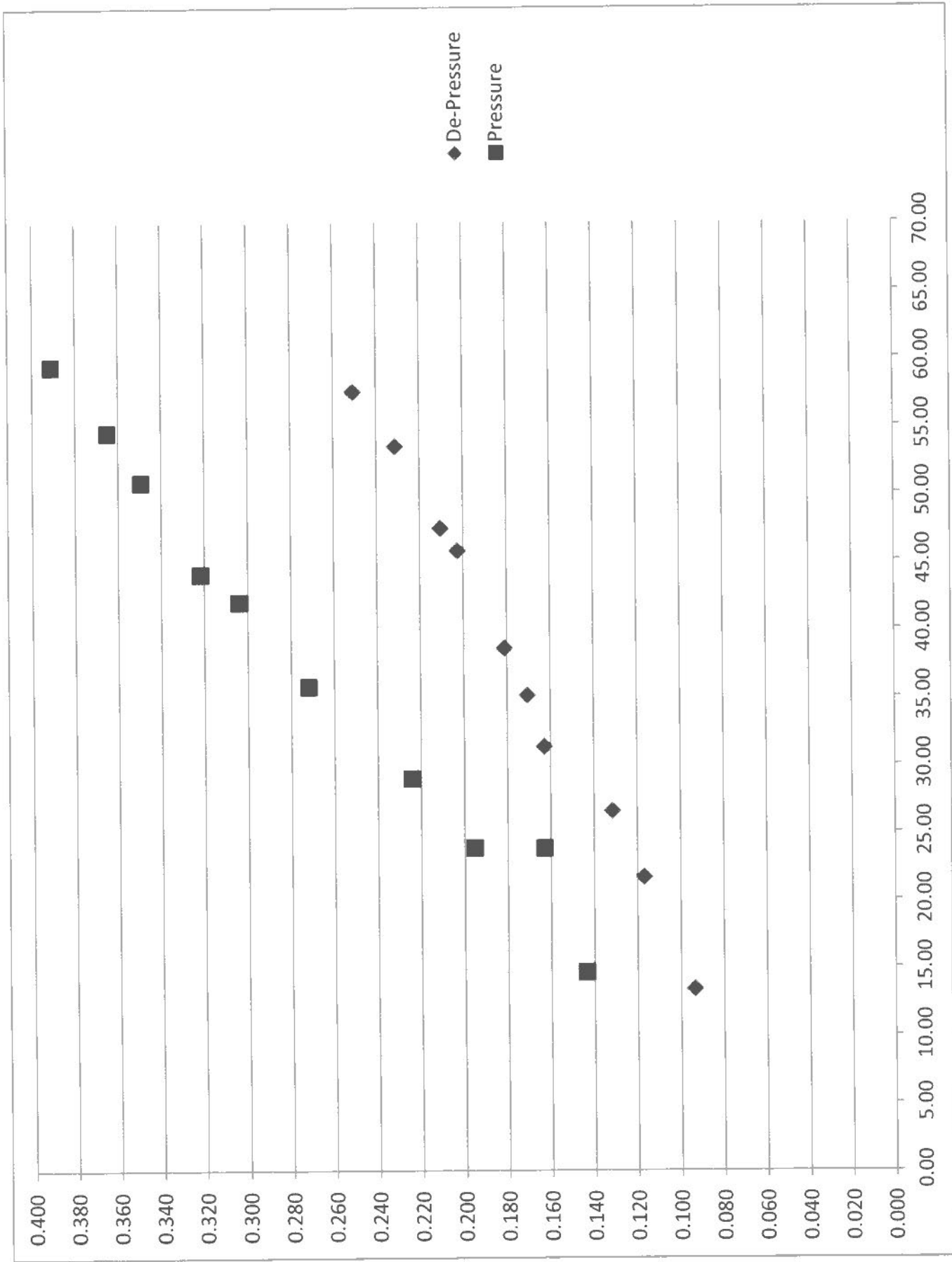
Slope 0.221

D = 0.223

◆ De-Pressure  
■ Pressure

ACH<sub>50</sub> 0.283  
0.285





# 547 Montague Blower Door (2017-02-10)

