



REPORT ON ENVELOPE AIR  
TIGHTNESS TESTING

AT



SPORTS HALL  
HMP LITTLEHEY  
CROW SPINNEY LANE  
PERRY  
HUNTINGDON  
PE28 0SR

CLIENT:  
WATES CONSTRUCTION



Name	Position	Signature	Date
Paul Cousins	Acoustic Office Manager		4/11/09

## 1. INTRODUCTION

This report details the results of the envelope air tightness test carried out by HRS Services Ltd at:

Sports Hall  
HMP Littlehey  
Crow Spinney Lane  
Perry  
Huntingdon  
PE28 0SR

The estimated year of construction was 2009.

The test was commissioned by David Bucknall.

## 2. TEST CONDITIONS AND RESULTS

The worst acceptable building air permeability performance criteria as defined in Section 2 of the Building Regulations 2000 (as amended), Part L2A Conservation of Fuel and Power in New Buildings Other Than Dwellings is  $10\text{m}^3/(\text{h}\cdot\text{m}^2)$  @ 50Pa.

The test was carried out on 30.10.09, between 12.45 and 13.15. The result is representative of the building as tested on this day.

The type of HVAC was mechanical.

The envelope area for air permeability is defined as the area of the external walls plus the area of the roof and the ground floor. The envelope area was calculated by the client.

The whole area of the building was tested.

The envelope area of the test area was  $2485.5\text{m}^2$ .

The following air permeability was determined at 50Pa.

$2.01\text{m}^3/(\text{h}\cdot\text{m}^2)$



The test area therefore **passed** the specified air permeability performance criteria

### Summary of Temporary Sealing

Temporary sealing was applied to unfinished elements, see table overleaf for full details. It should be noted that temporary seals may, in practice, be more airtight than the element they replace. The finished elements should therefore be of an equal standard of airtightness for the quoted test result to remain unchanged.

### 3. TEMPORARY SEALING

The following tables provide a detailed breakdown of the temporary sealing applied to the building during the air test.

Temporary sealing applied to intentional openings		
Element	Temporarily sealed for air test?	Comment/Extent of Sealing
HVAC supplies	No	Not commissioned
HVAC extracts	No	Not commissioned
Ventilation louvres	No	None
Drainage traps	Yes	Unfilled traps sealed
Other - Specify	No	None

Temporary sealing applied to un-intentional openings/incomplete works	
Element	Comment/Extent of sealing/Reason for Sealing
Lift shafts/smoke vents	None
Plant room	None
Service risers	None
Doors	1 door seal unfinished so temporarily sealed
Windows	None
Access hatches	None
Passive ventilation	None
Other - Specify	None

#### Comments on Temporary Sealing

All temporary sealing applied was in compliance with Building Regulations 2000 (as amended), Part L2A Conservation of Fuel and Power in New Buildings Other Than Dwellings.

#### 4. TEST METHOD

The envelope air tightness test was carried out in line with the following standards:

ATTMA TS1 Issue 2 - Measuring Air Permeability of Building Envelopes

BS EN 13829:2001 Thermal performance of buildings - Determination of air permeability of building - Fan pressurisation method.

The purpose of the test was method B (building envelope) as stated in BS 13829:2001. This requires that all adjustable openings shall be closed and remaining intentional openings sealed.

The building was pressurised using the HRS Services Ltd 'BLOWERDOOR' system. The BLOWERDOOR system comprises of a portable fan, designed to supply up to 2 m<sup>3</sup>/second at 70 Pascals static pressure. The BLOWERDOOR system was UKAS calibrated in accordance with BS 848 Part 1 1997.

The BLOWERDOOR system was set up in the single door.

Pressure differences across the BLOWERDOOR and the building were measured using digital micromanometers at the start, during and end of the test. All equipment used is calibrated to UKAS standards annually. Air temperatures were measured using Therma 1 digital thermometer with K Special penetration probes. Measurements were taken at the start and end of the test. The probes were located central and external to the building. Wind speeds at the start and end of the test were measured using a Kestrel K4000 meter. Barometric pressure was established by an absolute pressure meter.

The test area was prepared for air testing by the client. During the test HRS are external to the test area and are therefore reliant on the client maintaining the test area as agreed. The agreed test state of the test area is with all external windows and doors closed, and all internal doors open, with any temporary seals employed to remain intact for the duration of the test.

#### 5. DETAILS OF TEST RESULTS

Please refer to the test results overleaf. The results have been interpolated from the readings taken between 28Pa and 59Pa with a correlation co-efficient of **0.9934**.

##### Zero-Flow Pressure Differences

The mean fan off  $\Delta p$  at the start of the test,  $\Delta p_{0,1}$ , was 0

The mean fan off  $\Delta p$  at the end of the test,  $\Delta p_{0,2}$ , was 0

The zero flow pressure difference  $\Delta p_{0,1+}$  at the start of the test was 0

The zero flow pressure difference  $\Delta p_{0,1-}$  at the start of the test was 0

The zero flow pressure difference  $\Delta p_{0,2+}$  at the end of the test was 0

The zero flow pressure difference  $\Delta p_{0,2-}$  at the end of the test was 0

**FOR THE FULL SET OF CALCULATIONS USED TO CALCULATE  
THE AIR PERMEABILITY RATE, PLEASE GO TO**

[http://www.hrsservices.co.uk/downloads/air\\_permeability\\_calculations.pdf](http://www.hrsservices.co.uk/downloads/air_permeability_calculations.pdf)

Building Ref: 104557-AT10 Sports Hall

Date of Test: 30.10.09

$C_e = 0.1171$

$C_{L,env} = 0.1177$

$n = 0.6310$

Corr Coeff = 0.9934

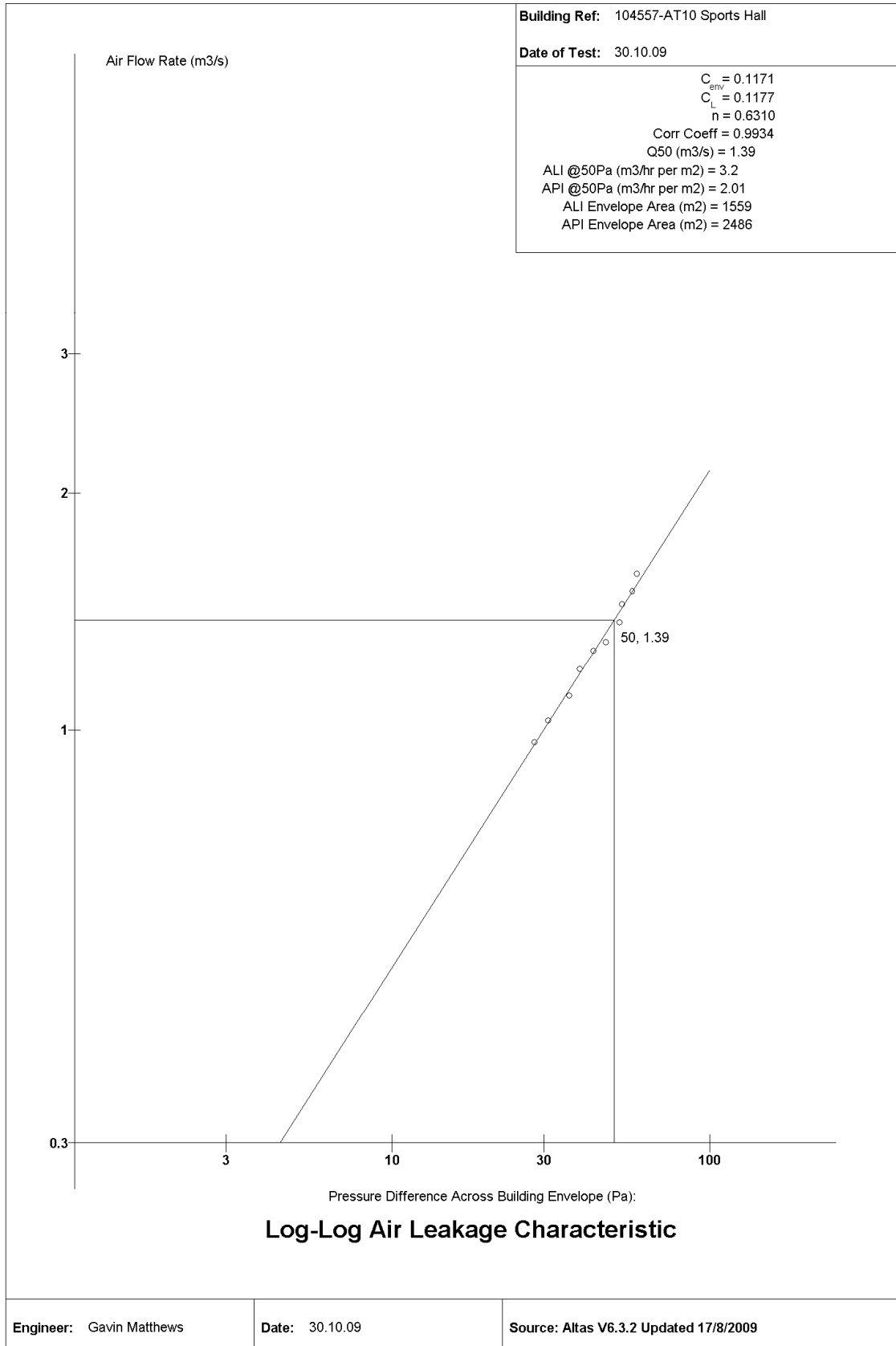
Q50 (m3/s) = 1.39

ALI @50Pa (m3/hr per m2) = 3.2

API @50Pa (m3/hr per m2) = 2.01

ALI Envelope Area (m2) = 1559

API Envelope Area (m2) = 2486



Engineer: Gavin Matthews

Date: 30.10.09

Source: Altas V6.3.2 Updated 17/8/2009

## Building Air Leakage Test Data Sheet

### Client Details

**Client Name:** Wates Construction

**Client Contact:** David Bucknall

**Building Ref:** 104557-AT10 Sports Hall

**HRS Ref. No:** 104557-AT10

**Site Address:**

Sports Hall  
HMP Littlehey  
Crow Spinney Lane  
Perry  
Huntingdon

### Air Leakage Test Details

**Test Start Time:** 12.45

**Test Data Base No:** 104557

**Test Finish Time:** 13.15

**Date of Test:** 30.10.09

**Pressurisation:**

**Depressurisation:**

**General Weather Conditions:**

Cloudy with moderate winds

### Measured Parameters

Parameter	Start	End
Wind Speed (m/s)	2	1.3
External Temp (deg C)	15	15
Internal Temp (deg C)	16.5	16.5
Barometric Pressure (Pa)	100700	100600
Fan off Press. Diff. (Pa)	0	0

**Internal temp Sensor Location:**

central

<b>Fan Speed</b>	0	0	0	0	0	0	0	0	0	0				
<b>(Pa)</b>	59	57	53	52	47	43	39	36	31	28				
<b>(m3/s)</b>	1.59	1.51	1.45	1.38	1.30	1.27	1.20	1.11	1.03	0.97				

**Engineer:** Gavin Matthews

**Date:** 30.10.09

**Source:** Altas V6.3.2 Updated 17/8/2009