Weather Louvre Test

Report 57668/1

Carried out for
Seng Yoon Seng Holdings SDN. BHD

By Andrew Freeth

14 January 2014

Weather Louvre Test

Carried out for:

Seng Yoon Seng Holdings SDN. BHD
No. 46, Jalan Industri PBP 3
Taman Industri Pusat Bandar Puchong
47100 Puchong
Selangor Darul Ehsan
Malaysia

Contract: **Report 57668/1**

Date: **14 January 2014**

Issued by: **BSRIA Limited**
Old Bracknell Lane West,
Bracknell,
Berkshire RG12 7AH UK

Telephone: +44 (0)1344 465600

Fax: +44 (0)1344 465626

E: bsria@bsria.co.uk W: www.bsria.co.uk

Compiled by:	Approved by:
Name: Andrew Freeth	**Name:** Mark Roper
Title: Senior Test Engineer	**Title:** Principal Test Engineer

CONTENTS

APPENDICES

FIGURES

1 INTRODUCTION

This report concerns tests conducted on a louvre to determine the Rainwater Penetration and the Pressure Drop versus Airflow Curve, with the associated Coefficient of Entry using the test methods contained within EN 13030 : 2001. The work was commissioned by Seng Yoon Seng Holdings SDN. BHD. and was carried out at BSRIA on 29 November to 3 December 2013.

Items received for test

Test Item	BSRIA ID
LV3575	57668A1

1.1 TEST ITEM INFORMATION

Contract		57668
Date		28-11-13
Manufacturer		Seng Yoon Seng Holdings SDN. BHD
Louvre Model		LV3575
Material		Galvanised Steel
Painted		No
Blade Height		948 mm
Blade Width		950 mm
Blade Depth		98mm
Frame Depth		100 mm
No. of Blades		9
Blade Pitch		107 mm (average)
Blade Angle		45° approx.
No. of Banks		1
Guard Type		None
Guard Spacing		N/A
Side Channels		None
Water Drip Tray		No
Blade Orientation		Horizontal

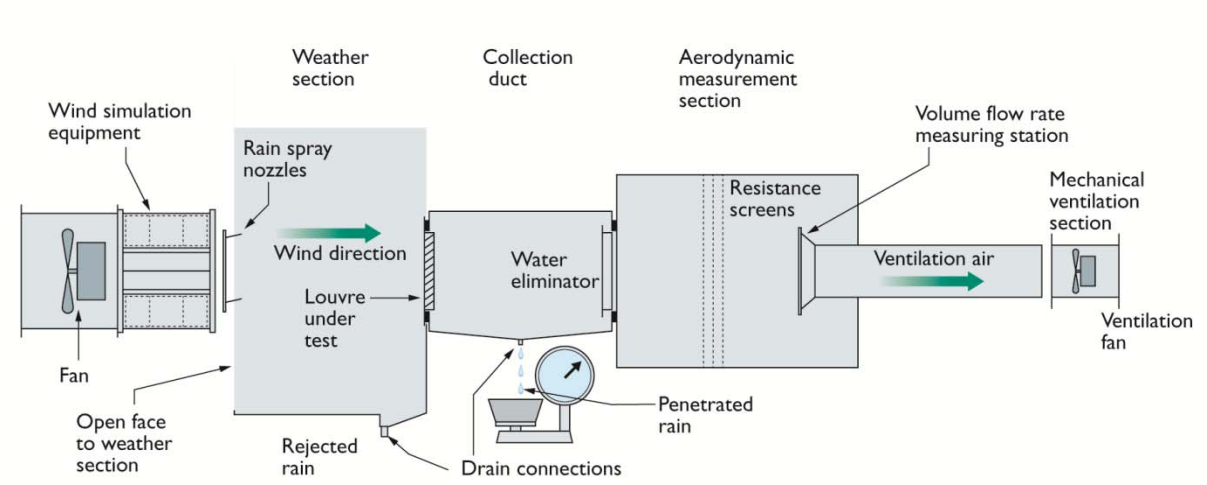
Note: Nominal pitch is 110mm but was reduced slightly for test sample purposes.

Figure 1 Test item 57668A1 (front)

Figure 2 Test item 57668A1 (rear)

2 TEST METHOD

A schematic representation of the rig used during testing



The test comprises of two parts:

2.1 WATER PENETRATION

The weather louvre is subjected to fan driven wind at a speed of 13 m/s and water sprayed as rainfall at a rate of 75 l/h. In addition to the simulated wind and rain, air is drawn through the louvre at various set velocities (0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0 and 3.5 m/s).

Each test is preceded by a suitable 'pre-test' soak which is typically around 30 minutes. Each test is run until the results become stable, and in any case, for a minimum of 30 minutes.

The penetrated water is collected in the collection duct and is measured and recorded against time elapsed.

A range of measurements are taken to give the characteristic curve for the test louvre.

2.2 PRESSURE DROP

For this test, the Aerodynamic Measuring Section (AMS) is separated from the main rig. The louvre is then mounted in the upstream opening of the AMS.

Pressure tappings in the plenum walls of the AMS allow measurement of the static pressure within the plenum during testing. The airflow volume is calculated from the differential pressure at the measuring cones. The plenum has a set of settling screens within to produce even flow through the cones and therefore give accurate reading of the total volume.

By adjusting the fan speed, the total airflow through the system varies and therefore changes the pressure on the louvre under test. A range of measurements are taken to give the characteristic curve for the test louvre.

2.3 TEST EQUIPMENT USED

Test equipment	BSRIA ID	Calibration Expiry Date
Water supply measurement	352	12-1-14
Rain measuring system	353	11-1-14
Airflow cones	364	15-1-14
Micromanometer	502	14-2-14
Scales (water)	1364	8-2-14

3 RESULTS

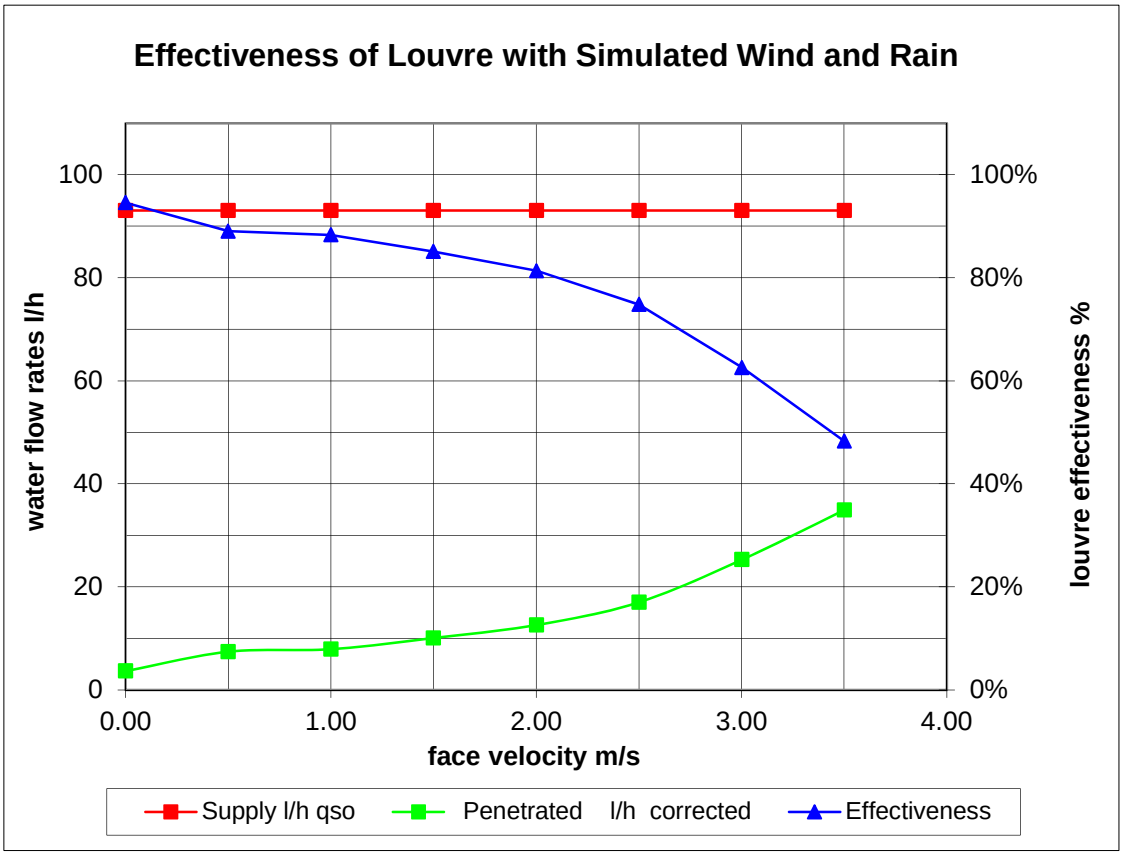
3.1 RAINWATER PENETRATION

MANUFACTURER Seng Yoon Seng Date 29/11/2013
MODEL LV3575 Contract 57668

Simulated rainfall 75 mm/hr
Wind speed 13.0 m/s

louvre height 948 mm
louvre width 950 mm
louvre area 0.901 m^2

VENTILATION RATE		WATER FLOW RATES		Effectiveness	Class
Volume m^3/s	Velocity m/s	Supply l/h	Penetrated l/h		
0.00	0.00	93.0	3.7	94.6%	C
0.45	0.50	93.0	7.4	89.0%	C
0.90	1.00	93.0	7.9	88.3%	C
1.35	1.50	93.0	10.1	85.1%	C
1.80	2.00	93.0	12.6	81.3%	C
2.25	2.50	93.0	17.0	74.8%	D
2.70	3.00	93.0	25.3	62.6%	D
3.15	3.50	93.0	34.9	48.3%	D



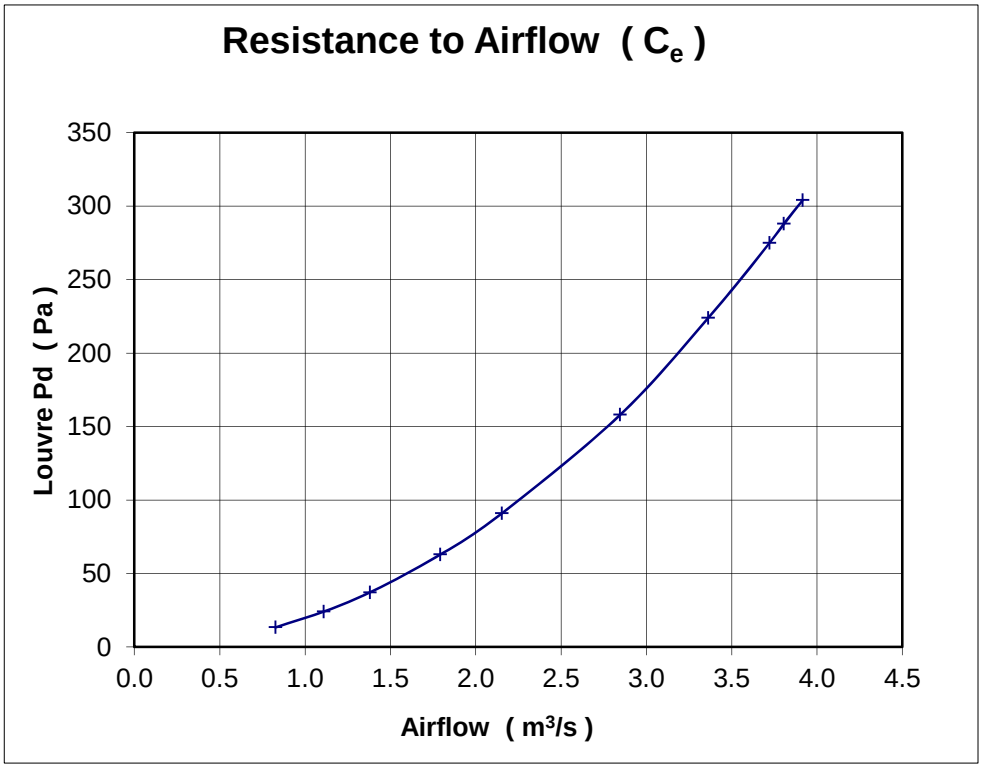
COEFFICIENT OF ENTRY

MANUFACTURER Seng Yoon Seng
MODEL LV3575

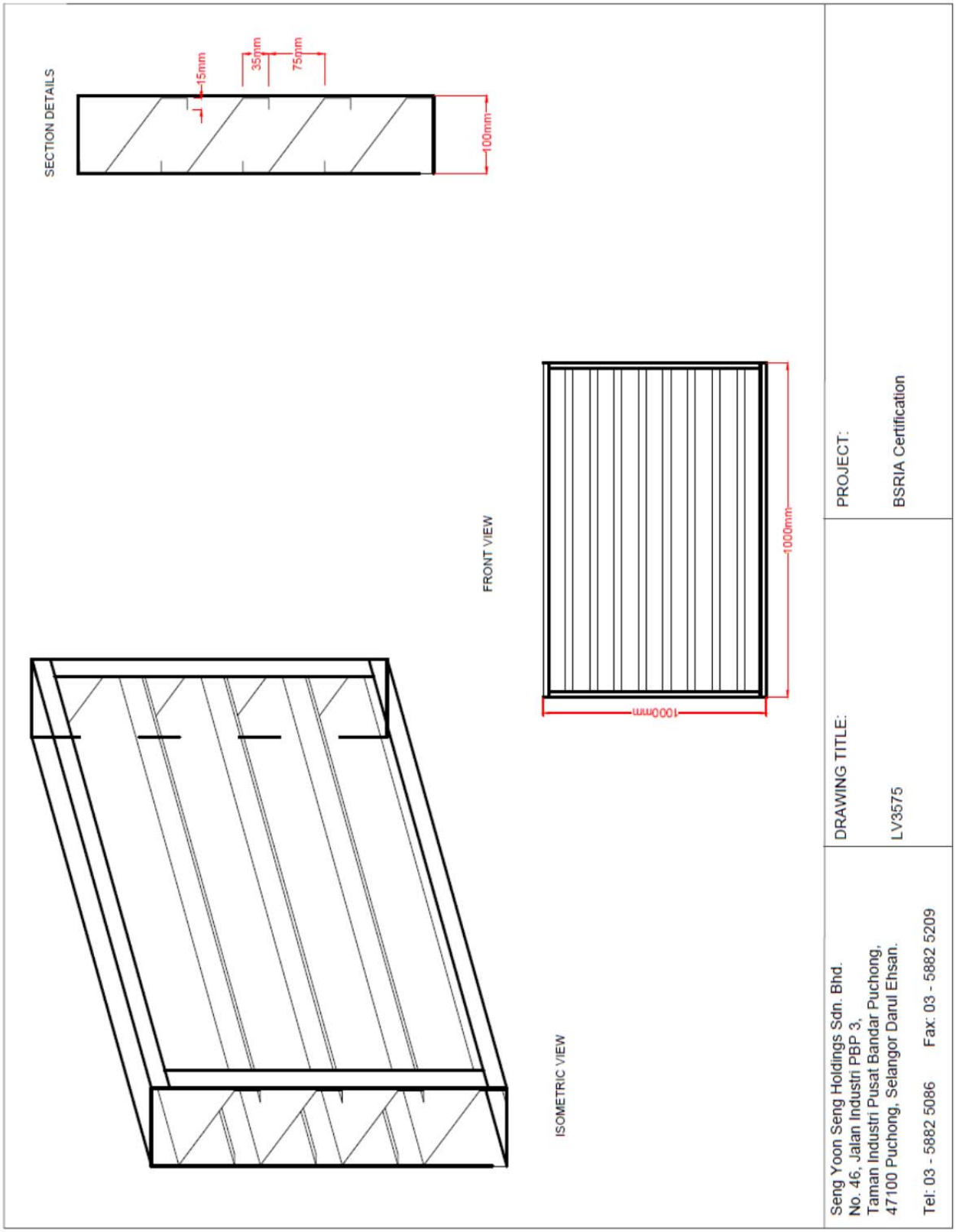
Date 29/11/2013
Contract 57668

air temperature	17.3	°C	louvre height	948	mm
barometer	1016	mbar	louvre width	950	mm
air density	1.214	kg/m^3	louvre area	0.901	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_e
304.0	4.35	3.916	20.159	0.194
288.0	4.23	3.806	19.621	0.194
275.0	4.13	3.722	19.173	0.194
224.0	3.73	3.363	17.304	0.194
158.0	3.16	2.847	14.533	0.196
91.0	2.39	2.153	11.029	0.195
63.0	1.99	1.793	9.177	0.195
37.2	1.53	1.381	7.052	0.196
24.2	1.23	1.109	5.688	0.195
13.4	0.92	0.827	4.232	0.195
			mean C_e	0.195
			Class	4



APPENDIX: A MANUFACTURER'S DRAWING



Note: Nominal pitch is 110mm but was reduced slightly for test sample purposes.