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CONFIDENTIAL

Test Report : Chilt/RF06167

**A fire resistance test performed on
a one and a half leaf, single acting doorset with glazing
and a single leaf, single acting doorset**

Test conducted in accordance with BS 476 : Part 22 : 1987

Test Date: 26 February 2007

Test for :
Deanta Wood
Curraheen
Tralee
Co Kerry
Ireland

Page 1 of 18

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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No. 1762

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1 Introduction

The doorsets were manufactured and supplied for test by the client and delivered on during February 2007. Chiltern International Fire Limited (CIFL) conducted further work on the doorsets as follows:

Doorset A: Glazing beads

CIFL constructed a timber stud/plasterboard clad partition and installed the doorsets into the partition.

2 Specification

Details of the specimen are shown in Figures 1 to 4.

2.1 Door leaves

The left doorset was designated doorset A and the right doorset was designated doorset B. The left leaf of doorset A measured 2279mm high x 460mm wide x 49.5mm thick and the right leaf measured 2279mm high x 915mm wide x 49.5mm thick. The leaf of doorset B measured 2260mm high x 915mm wide x 49mm thick. All leaves were hung to open in towards the furnace, which is considered to be the most onerous direction based on experience of testing doors of similar construction. It is therefore the opinion of the laboratory that the test results can be applied to doors opening in either direction. The results of this test were obtained from doorsets each fitted with a latch but disengaged. The flush bolts in doorset A were engaged for the test.

2.2 Door perimeter gaps

The gaps between the edge of the doors and frame were measured prior to test. A total of 31 readings were taken. The measurements (in mm) are given in Figure 4.

2.3 Closer forces

Measured in accordance with FTSG Resolution No 63.

		Opening force (Nm)	Closing force (Nm)
Doorset A	Left leaf	n/a	n/a
	Right leaf	60	26
Doorset B		52	27

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3 Test conditions

- 3.1 Where areas of the test specification are ambiguous or open to interpretation the Fire Test Study Group Resolutions No's 51, 63, 70, 71, 72 and 78 have been followed (further specific details are available on request). These Resolutions provide basis of common agreements between the fire test laboratories which are members of this Group.
- 3.2 The ambient temperature of the test area at commencement of test was 16°C.
- 3.3 After the first 5 minutes of the test, the furnace pressure was maintained at 0 ± 2 Pa with respect to atmosphere, at a point 1m from the notional floor level.
- 3.4 The furnace was controlled to follow the temperature/time relationship specified in BS 476: Part 20: 1987 as closely as possible, using the average of six thermocouples suitably distributed within the furnace. The temperatures recorded are shown graphically in Section 4.1.
- 3.5 The temperature of the unexposed face of doorset A was monitored by means of five thermocouples fixed to the surface of the door leaves, and four thermocouples attached to the frame, one at midheight on each jamb and one centrally located above each leaf on the frame head.

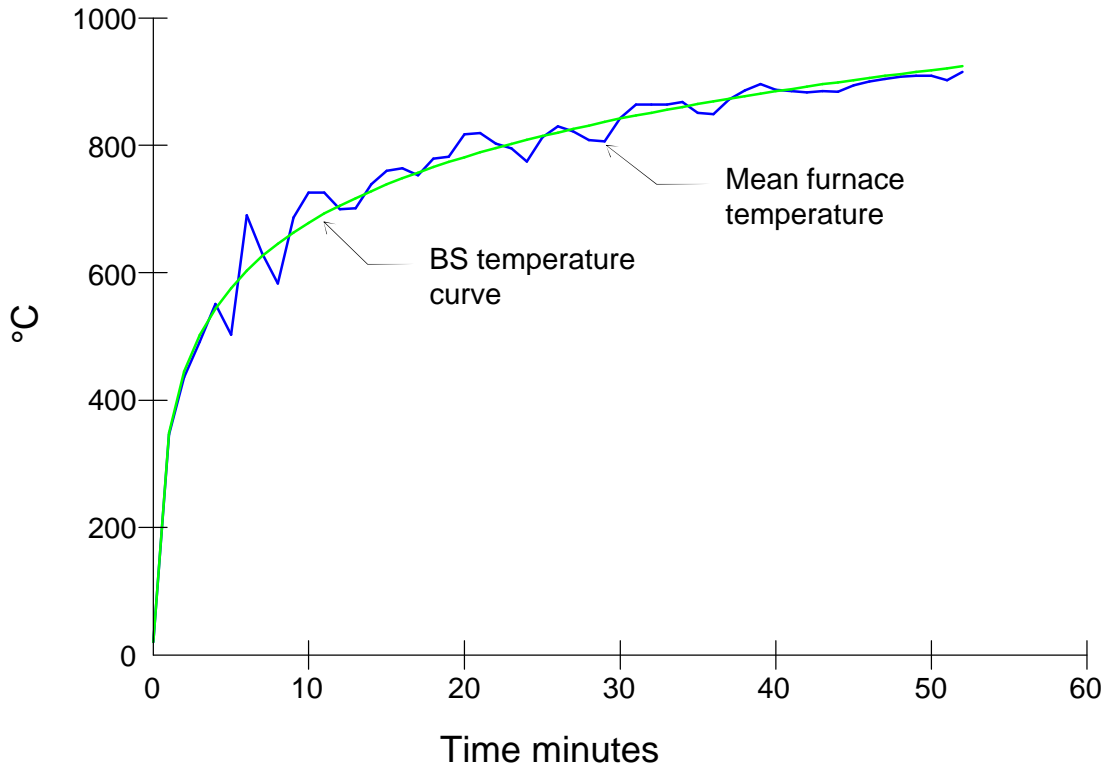
The temperature of the unexposed face of doorset B was monitored by means of five thermocouples fixed to the surface of the door leaf, and three thermocouples attached to the frame, one at midheight on each jamb and one centrally located above the leaf of on the frame head.

The thermocouple positions are shown in Figure 4. The average temperature of each door leaf and maximum temperature of each doorset are shown graphically in Section 4.2.

4 Test results

The following data and observations were recorded during the test.

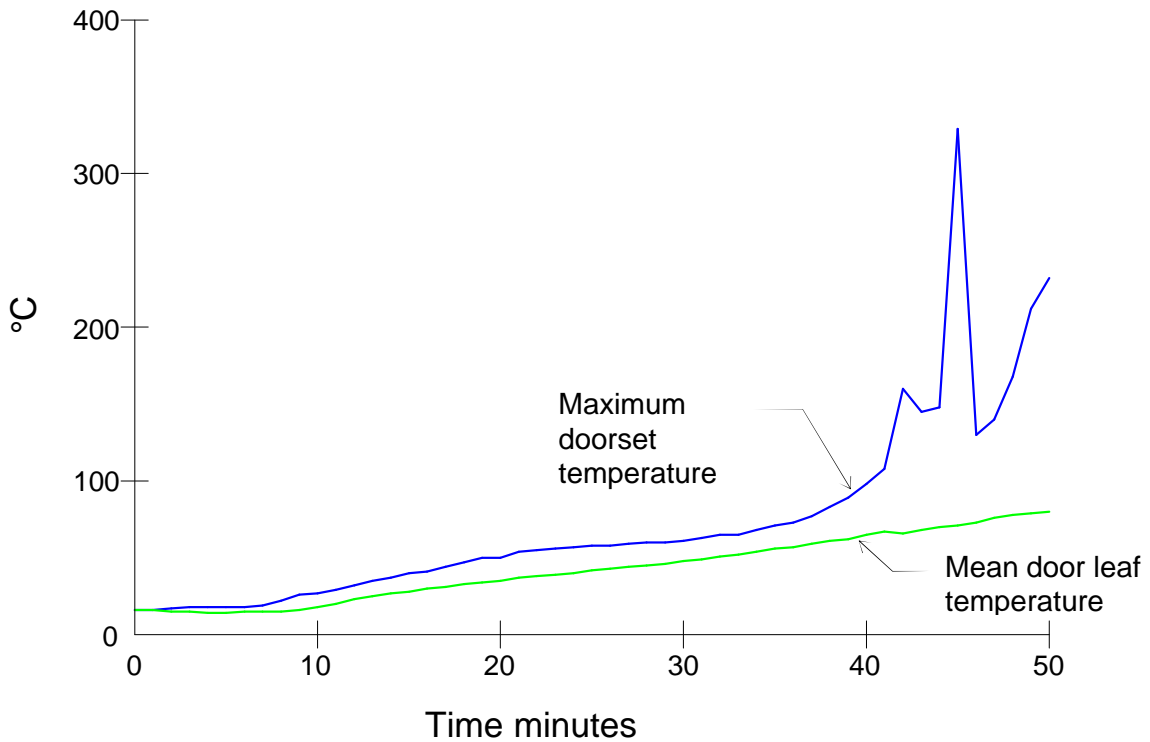
4.1 Furnace temperature curve



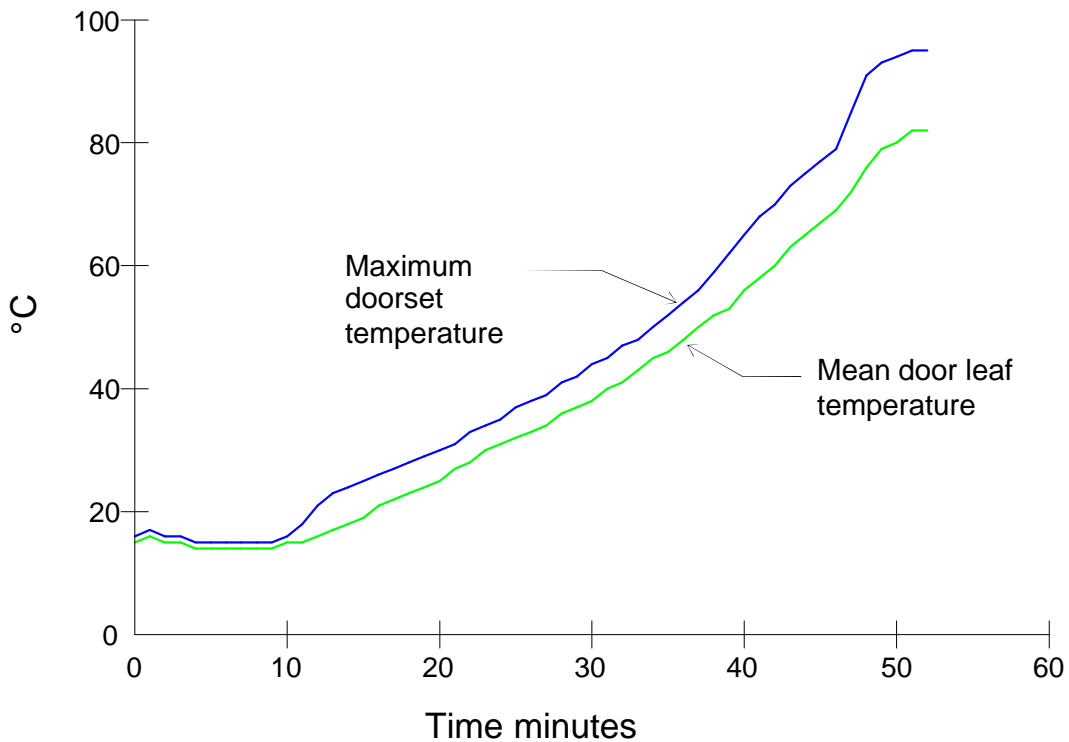
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4.2 Unexposed face temperature curves

Doorset A



Doorset B



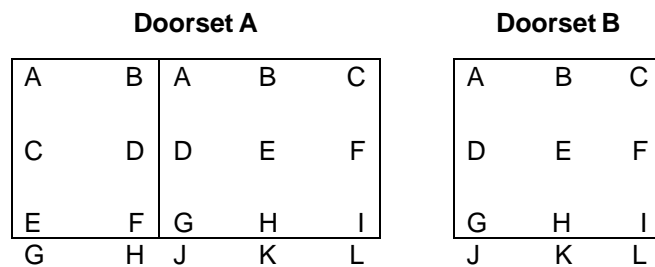
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4.3 Door distortion data

The following tables show the distortion of the doors in mm with an accuracy of ± 1 mm. A positive measurement indicates distortion towards the fire.

A negative measurement indicates distortion away from the fire.

J, K and L give vertical movement of the door, a negative reading indicates that the door has dropped.



Doorset A - left leaf (hung on the left and opening in towards the fire)

Time	A	B	C	D	E	F	G	H
10	0	-6.5	4	2	1	-3	1	0
20	1	-6.5	4	1	2	-3	0	-1
30	4	-5.5	5	-14	5	-8	-3	-3
40	8	-6.5	-2	-29	10	-11	-4	-4

Doorset A - right leaf (hung on the right and opening in towards the fire)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	-1	1	0	2	1	3	1	2	1	-1	-1	-1
20	-1	5	0.5	-1	1	3	-1	1	2	-3	-2	-2
30	-1	0	4	-15	-7	3	-9	-4	2	-5.5	-4	-4
40	-1	2	8	-36	-21	-2	-11	-4	2	-7	-6	-5

Doorset B (hung on the right and opening in towards the fire)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	-2	-1	0	5	3	-	-2	4	0	1	0.5	0
20	-1	-0.5	1	0	6	-	2	7	1	-1	-1	-1
30	4	0	2.5	3	1	-	7	8	3	-3	-3	-3
40	6	0	5	0	-4	-	7	6	2	-4.5	-6	-6

Where a dash (-) applies, a distortion reading could not be taken

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4.4 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes)	Comments
00.00	Test started.
03.00	Doorset A, there is smoke issuing from the top of the meeting edge of the leaves. Doorset B, there is smoke issuing from the top closing corner of the leaf.
03.30	Doorset A, there is an increase in the level of smoke issuing from the approximately 200mm down the meeting edge of the leaves. Doorset B, there is an increase in the level of smoke issuing from the top closing corner of the leaf.
05.30	Both doorsets, there is smoke issuing from the top half of the perimeter of the leaves.
08.00	Doorset A, there is a decrease in the level of smoke issuing from all areas except at the latch position, top of the meeting edge of the leaves and top hanging corner of each leaf where smoke continues issuing. Doorset B, there is smoke issuing from the top closing and hanging corners of the leaf and top half of the closing edge of the leaf.
10.30	Doorset B, the smoke has stopped issuing from the top half of the closing edge of the leaf.
13.00	Doorset A, there is discolouration of the leaf face at the top of the meeting edge of each leaf. Smoke continues issuing from the top hanging corners of each leaf, top of the meeting edge of the leaves and latch position.
15.00	Doorset B, there is a decrease in the level of smoke issuing from the top hanging and closing corners of the leaf, the smoke has stopped issuing from all other areas.
16.00	Doorset A, there is intermittent flaming from the latch position.
19.30	Doorset A, there is smoke issuing from the both vertical sides of the glazing bead.
20.42	Doorset A, a cotton pad integrity test was performed approximately 50mm above the latch position which resulted in ignition of the cotton pad thereby constituting integrity failure .
22.00	Doorset A, there is smoke issuing and discolouration at both top hinge positions and from the top hanging corner of the left leaf.
29.10	Doorset A, there is continuous flaming from the latch position thereby constituting further integrity failure . Sealed with mastic.

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- 31.00 Doorset A, there is smoke issuing and discolouration at the middle hinge positions and an increase in the level of smoke issuing and discolouration at the top hinge positions.
Doorset B, there is smoke issuing and discolouration at the top hinge position.
- 32.00 Doorset B, there is intermittent flaming from the key hole of the latch position.
- 33.20 Doorset B, a cotton pad integrity test was performed above the latch position, no failure.
- 36.38 Doorset B, a cotton pad integrity test was performed approximately 50mm above the latch position which resulted in ignition of the cotton pad thereby constituting **integrity failure**.
- 37.30 Doorset A, there is an increase in the level of smoke issuing from the vertical sides and top of the glazing beads.
- 38.00 Doorset A, there are glows visible at the top hinge positions.
- 39.25 Doorset A, right leaf, a cotton pad integrity test was performed at the top hinge position, no failure.
- 40.05 Doorset B, there is continuous flaming from the latch position thereby constituting further **integrity failure**. Sealed with mastic.
- 40.46 Doorset A, there is continuous flaming from the top left of the glazing bead thereby constituting further **integrity failure**.
- 42.35 Doorset A, right leaf, there is continuous flaming from the top hinge position thereby constituting further **integrity failure**.
- 44.10 Doorset a, left leaf, there is intermittent flaming from the top hinge position.
- 44.22 Doorset A, left leaf, there is continuous flaming from the top hinge position to the top hanging corner of the leaf thereby constituting further **integrity failure**.
- 45.00 Doorset A, there is continuous flaming from the bottom flush bolt position thereby constituting further **integrity failure**.
- 46.13 Doorset A, a cotton pad integrity test was performed at the top of the meeting edge of the leaves, no failure.
- 47.00 Doorset B, there is smoke issuing and discolouration at the head of the leaf and middle hinge position.
- 47.50 Doorset B, there is a line of discolouration across the leaf located approximately one-third the way down from the head.
- 50.00 Doorset B, there is a glow visible at the top closing corner of the leaf.
- 50.32 Doorset B, a cotton pad integrity test was performed at the top closing corner of the leaf, no failure.

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- 51.45 Doorset B, a cotton pad integrity test was performed at the top closing corner of the leaf, no failure.
- 52.05 Doorset B, there is continuous flaming from across the head of the leaf thereby constituting further **integrity failure**.
- 52.30 Test terminated.

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4.5 Times to failure

Doorset A was tested in accordance with BS 476: Part 22: 1987, Method 7, Determination of fire resistance of partially insulated doorsets and shutter assemblies and doorset B was tested in accordance with BS 476: Part 22: 1987, Method 6, Determination of fire resistance of fully insulated doorsets and shutter assemblies. The requirements of the standard were satisfied for the following periods:

	Doorset A	Doorset B
Integrity	20 (twenty) minutes	36 (thirty six) minutes
Insulation	20 (twenty) minutes *	36 (thirty six) minutes



* In accordance with the note to clause 7.6.1.1 of BS 476: Part 22: 1987, the glazing has not been evaluated for insulation

5 Limitations

The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential fire performance of the element in use nor do they reflect the actual behaviour in fires.

The results of this test were obtained using the door to frame gaps recorded in Figure 4. The fire resistance performance of doors of this design may change if substantially different gaps are employed.

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. CIFL will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

Signature:		
Name:	Mark Cummings	Jonathan Osborn
Title:	Senior Test Engineer	General Manager
Date of issue:	14 June 2007	

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Description of construction (refers to Figures 1 to 4)

Leaf - both doorsets

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Stiles & rails		None fitted	-	-	8	-
Core *		Fir vertical lamel finger jointed core	50 wide x 39 thick x 300 long (each lamel)	550	8.5-9	1
Facings *		Veneered MDF with 2mm deep 'V' shaped grooves	5 thick	-	-	2
Adhesive	Lipping	Urea formaldehyde	-	-	-	-
	Facings	Urea formaldehyde	-	-	-	-
	Core	Urea formaldehyde	-	-	-	-
Lippings - all edges *		Oak	12 thick	670	-	3

* Information provided by the client and could not be verified by CIFL

Door frame - both doorsets

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Head & jambs		Red deal	117 deep x 31 thick (excluding stop)	550*	9.5	4
Head to jamb jointing detail		Mitred - screwed	-	-	-	-
Stops		Red deal - planted (pinned)	Overall 16 deep x 43 thick	550*	9-9.5	5
Frame to supporting construction fire stopping detail		Acrylic intumescent mastic	Nominally 5 wide x 10 deep	-	-	-
Frame to supporting construction fixing detail		3No steel wood screws per jamb	100 long	-	-	-
Architrave		European redwood	16 thick	510**	11.5	-
Threshold		Non combustible	-	-	-	-

* Stated density not checked by laboratory

** Nominal density

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Intumescent materials - doorset A

		Make/type	Size (mm)	Location	Key to figures	
Door edges	Head & hanging edges	None fitted	-	-	-	
	Meeting edges	Left leaf	Reddiplex Group plc graphite with brush seal	15 x 4	Fitted in the meeting edge 19 from the unexposed face	6
		Right leaf	Reddiplex Group plc graphite seal	15 x 4	Fitted in the meeting edge 19 from the unexposed face	7
Frame reveal - head & jambs		Reddiplex Group plc graphite with brush seal	15 x 4	Fitted in the frame reveal 14 from the exposed face	8	
Around hinges		Fully interrupted	-	Hinge blade fully interrupts the hinge blade	-	
Under hinge blade		None fitted	-	-	-	
Encasing latch body		None fitted	-	-	-	
Under latch forend		None fitted	-	-	-	
Under latch keep		None fitted	-	-	-	
Glazing perimeter - right leaf		Lorient Polyproducts Ltd System 36/6	As Lorient's specification	Fitted around the perimeter of the glazing	9	

Intumescent materials - doorset B

		Make/type	Size (mm)	Location	Key to figures
Door edges		None fitted	-	-	-
Frame reveal - head & jambs		Reddiplex Group plc graphite with brush seal	15 x 4	Fitted in the frame reveal 14 from the exposed face	10
Around hinges		Fully interrupted	-	Hinge blade fully interrupts the hinge blade	-
Under hinge blade		None fitted	-	-	-
Encasing latch body		None fitted	-	-	-
Under latch forend		None fitted	-	-	-
Under latch keep		None fitted	-	-	-

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Ironmongery - doorset A

	Make/type	Size (mm)	Location	Key to figures
Hinges	3No Pro-Line journal hinges	98 x 34 (blade size)	Fitted 183, 972 and 1961 from the head of the left leaf and 181, 969 and 1959 from the head of the right leaf	11
Closer	Dorma Door Controls Ltd TS73V surface mounted overhead closer	233 x 60 (footprint size)	Fitted to the exposed face of the right leaf only as per manufacturer's specification	12
Latch	Basta 506/506 2 lever sash lock - disengaged	23 x 150 (forend size)	Fitted 1257 from the head to the centre of the latch nib	13
Furniture	Brushed aluminium lever handles	153 x 40 (footprint size)	Fitted appropriate to the latch	14
Flush bolts	Basta flush bolts - engaged	160 x 15 (forend size)	Fitted at the top and bottom of the meeting edge of the left leaf	15

Ironmongery - doorset B

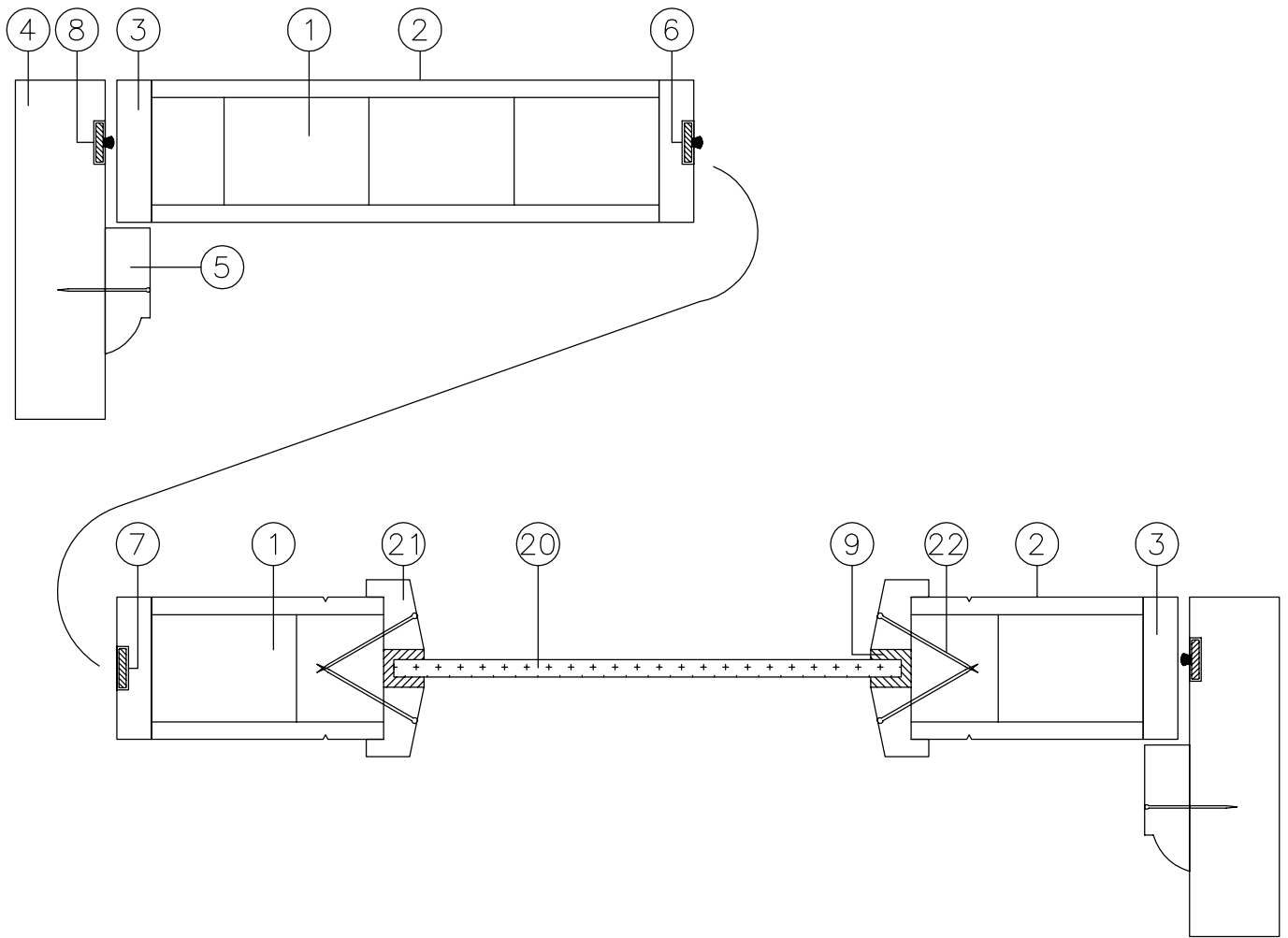
	Make/type	Size (mm)	Location	Key to figures
Hinges	3No Pro-Line journal hinges	98 x 34 (blade size)	Fitted 181, 970 and 1960 from the head of the leaf	16
Closer	Dorma Door Controls Ltd TS73V surface mounted overhead closer	233 x 60 (footprint size)	Fitted to the exposed face as per manufacturer's specification	17
Latch	Basta 506/506 2 lever sash lock - disengaged	23 x 150 (forend size)	Fitted 1236 from the head to the centre of the latch nib	18
Furniture	Brushed aluminium lever handles	153 x 40 (footprint size)	Fitted appropriate to the latch	19

Glazing - right leaf of doorset A only

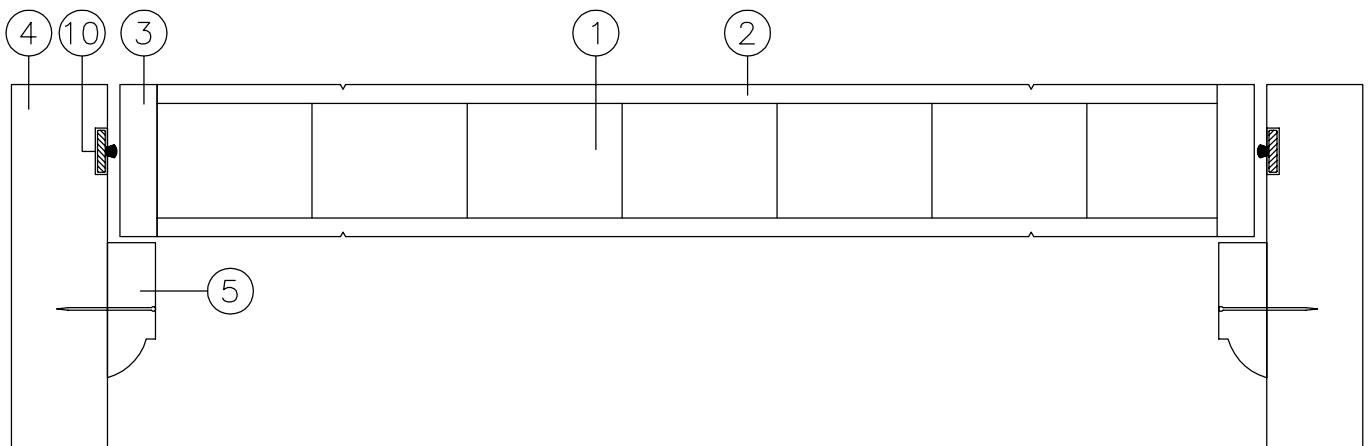
	Make/type	Size (mm)	Location	Key to figures
Glass type	Pilkington Pyroshield Georgian wired glass	6 thick	Located 190 from the head and 207 from the meeting edge of the leaf	20
Sight size	-	460 x 460	-	-
Overall aperture size	-	500 x 500	-	-
Expansion allowance	-	2.5 each edge	-	-
Beading	Sapele (MC 8%)	20 high x 24 deep including a 6 x 6 bolection return and 12° chamfer	Fitted on both faces around the perimeter of the aperture	21
Beading fixings	Steel pins	40 long	50 from the corners at 130 centres and 30° to the face of the glass	22

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Section A-A



Section B-B



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Title

Horizontal cross sections

Date Drawn
 13/03/07

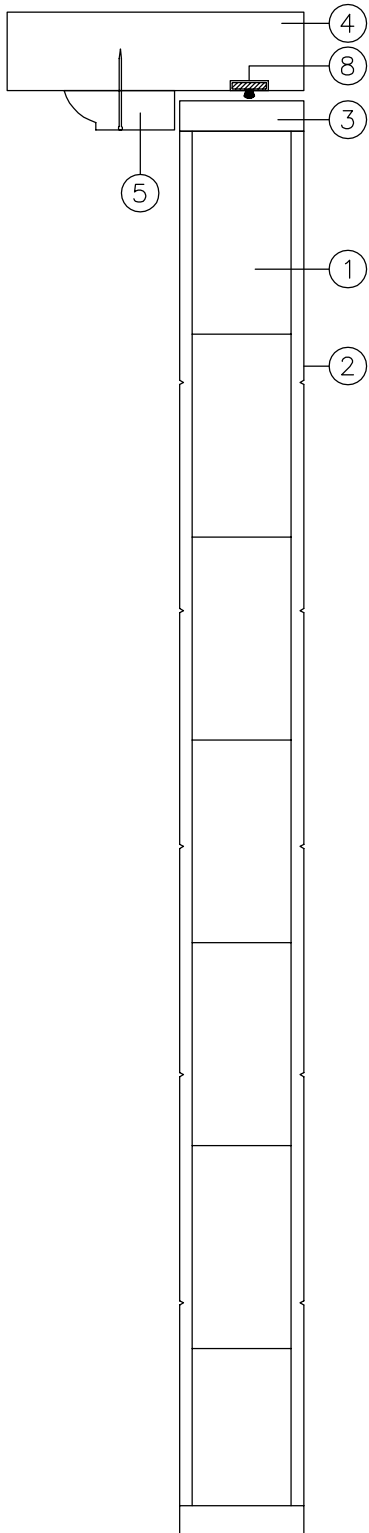
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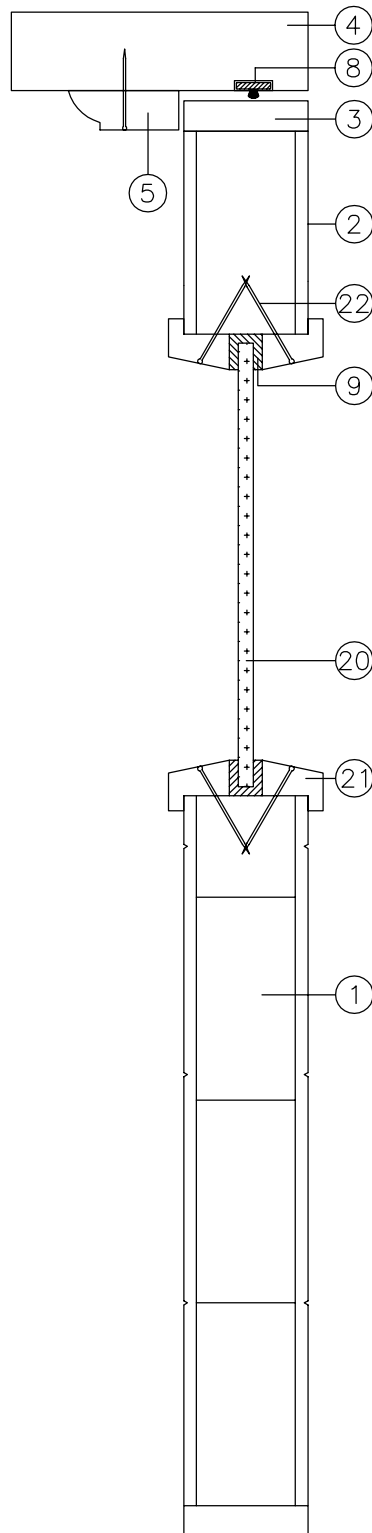
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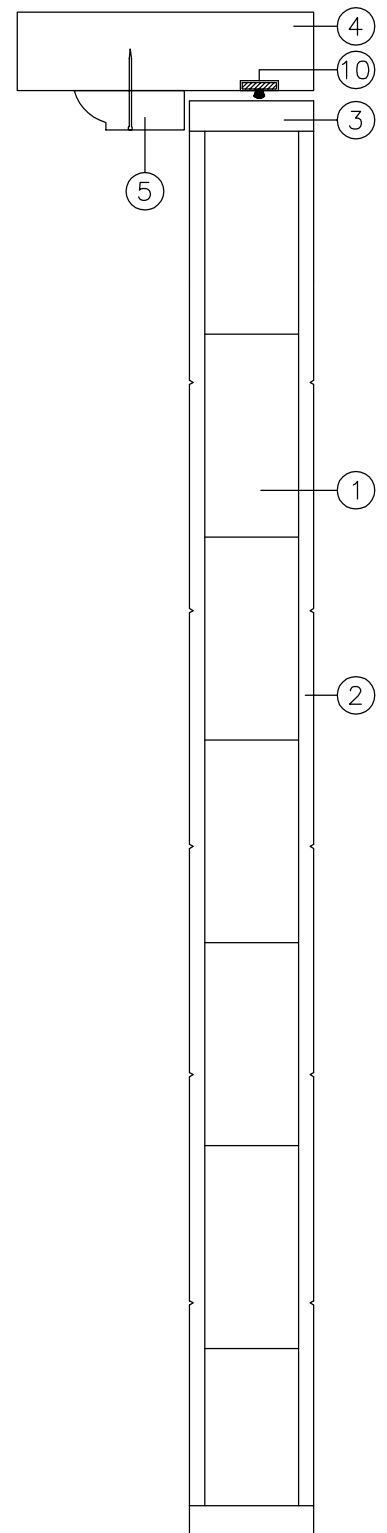
Section C-C



Section D-D



Section E-E



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Title

Vertical cross sections

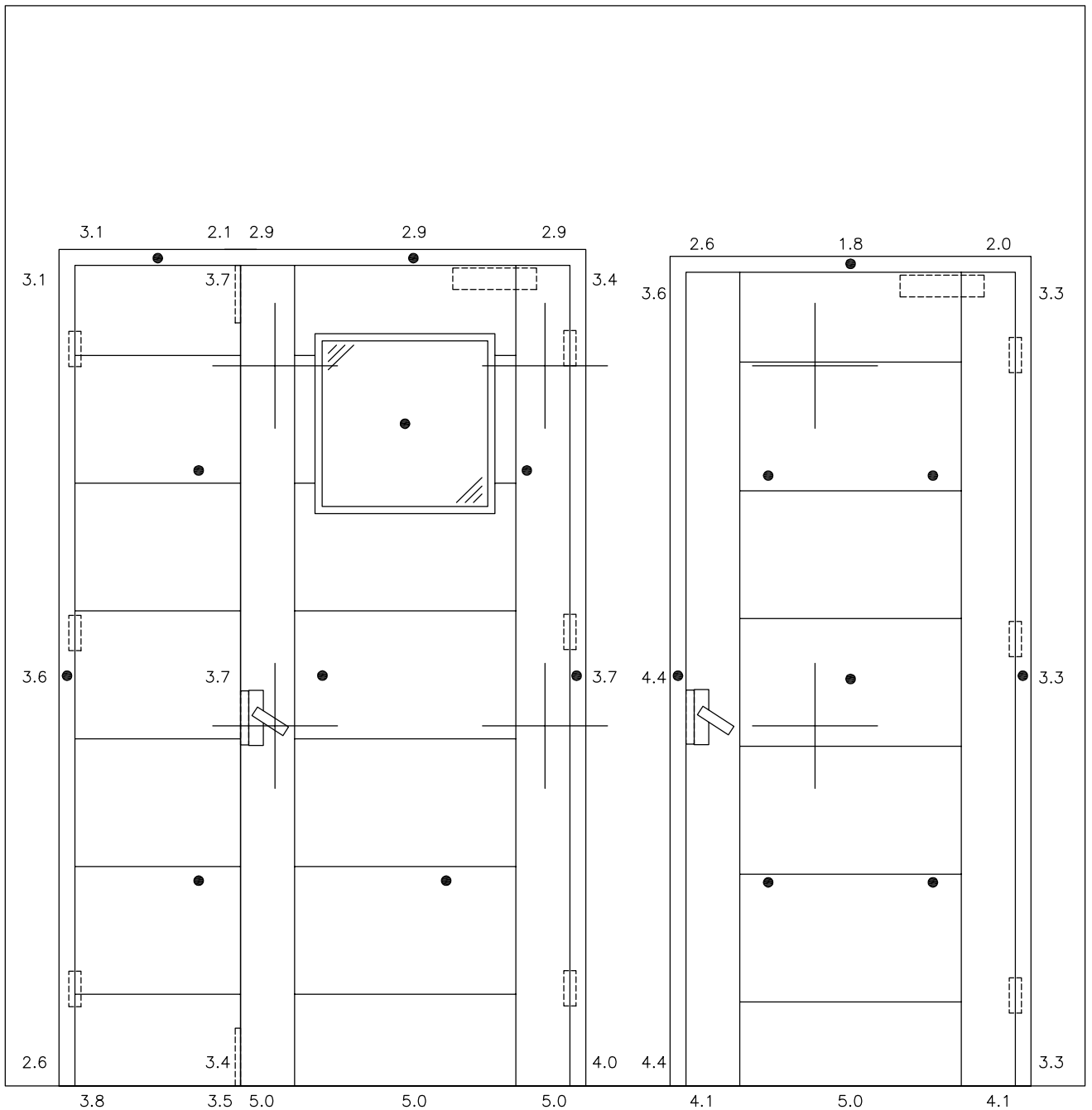
Date Drawn
 13/03/07

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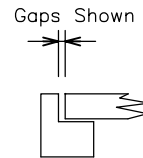
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 : Furnace Thermocouples
 : Unexposed Face Thermocouples



Viewed From Unexposed Face



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Title Thermocouple positions
 and door gaps
 (All dimensions in mm)

Date Drawn
 13/03/07

Drawn By
 SP

Scale
 NTS

Project No.
 Chilt/RF06167

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