

Title:

Fire Resistance Test
In Accordance With
BS EN 1365-2: 2014,
On A Loadbearing
Timber Floor
Construction Protected
By A Plasterboard
Ceiling And
Incorporating Ten
Down Lighters.

Date of Test:

25th February 2021

Issue 1:

25th May 2021

WF Report No.

438287/R



Prepared for:

**JCC Lighting
Products Ltd.**

Innovation Centre,
Beeding Close
Southern Cross
Trading Estate,
West Sussex,
PO22 9TS



0249

Test Assembly

Summary of Tested Assembly

The timber floor had overall nominal dimensions of 4300 mm long by 2980 mm wide by 257 deep. The floor comprised 220 mm high Metsä Wood UK joists, referenced 'Finnjoist FJ1 45x220-36', at 600 mm centres. The unexposed face of the floor comprised nominally 22 mm thick flooring grade tongue and groove chipboard. The floor assembly was protected by a single layer of 15 mm thick 'Gyproc Wallboard', through fixed to the joists with screws.

The ceiling incorporated ten downlighter light fittings. The lights were referenced as follows:

Test Ref.	Model Ref.	Converter Plate.	Cut Out Diameter.
1	V50 JC1001 BN		70 mm
2	V50 Tilt JC1002 CH		85 mm
3	JC010010 WH		72 mm
4	V50 JC1001 BN	JC1003 BN	70 mm
5	JC010016 WH		72 mm
6	JC010023 WH		84 mm
7	JC94110		74 mm
8	JC94113		74 mm
9	JC94114		85 mm
10	V50 Tilt JC1002 CH	JC1004 BN	85 mm

The floor supported a uniformly distributed load of 1.1kN/m². This load was provided by the test sponsor.

Detailed drawings of the test specimen(s) and a comprehensive description of the test construction based on a detailed survey of the specimen(s) and information supplied by the sponsor of the test are included in the Test Specimen and Schedule of Components sections of this report.

Performance Criteria and Test Results

Loadbearing Capacity

This is the time in completed minutes for which the test specimen continues to maintain its ability to support the test load during the test. Support of the test load is determined by both the amount and the rate of Deflection. The limiting deflection and the limiting rate of deflection for the specimen, as specified by BS EN 1363-1:2012 clause 11.1, are calculated as:

Criteria	Value
<i>L</i> : Clear span - in mm	4120
<i>d</i> : Depth of structural section - in mm	220
Limiting deflection ($L^2/400d$) - in mm	192.9
Limiting rate of deflection ($L^2/9000d$) - in mm/min	8.6
Measured deflection $1.5 \times (L^2/400d)$ - in mm	289.3

Failure to support the load is deemed to have occurred when a '**Measured Deflection**' greater than or equal to '**1.5 x Limiting Deflection**' is observed

Or

Both the '**Limiting rate of deflection**' and '**Limiting deflection**' are exceeded.

The criterion was satisfied for **33 minutes** after which time the test was discontinued.

Integrity

It is required that the specimen retains its separating function, without:

- causing ignition of a cotton pad when applied
- permitting the penetration of a gap gauge as specified in BS EN 1363-1: 2020
- sustained flaming on the unexposed surface
- subsequent failure of loadbearing capacity

These requirements were satisfied for the periods shown below:

Sustained flaming

33 minutes*

Gap gauge

33 minutes* No failure*

Cotton pad

33 minutes*

Insulation

It is required that the mean temperature rise of the unexposed surface shall not be greater than 140°C and that the maximum temperature rise shall not be greater than 180°C. Insulation failure also occurs simultaneously with integrity failure.

These requirements were satisfied for the period shown below:

Specimen

33 minutes* No failure*

*The test duration. Test was discontinued after a period of 33 minutes.

Date of Test

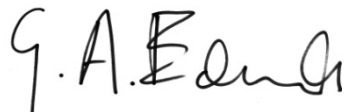
25th February 2021

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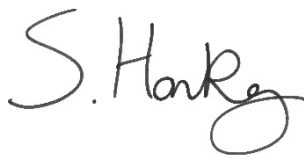
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* For and on behalf of **Warringtonfire**.

Report Issued: 25th May 2021

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Revision History

Issue No:	Re-issue Date:
Revised By:	Approved By:
Reason for Revision:	

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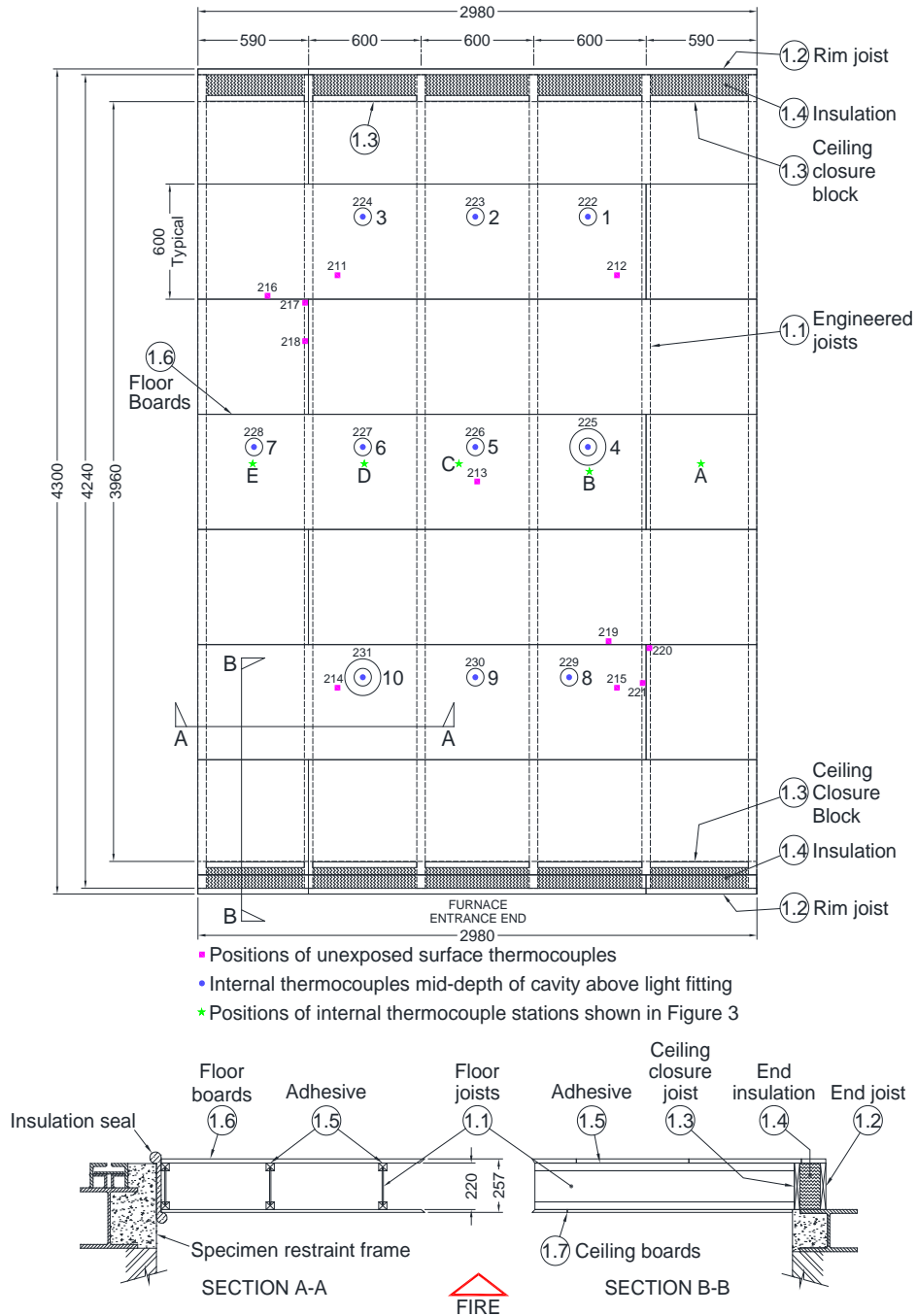
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Test Conditions

Standard	<p>BS EN 1365-2: 2014, 'Fire resistance tests for loadbearing elements – Part 2: Floors and Roofs'</p> <p>The purpose of the test was to evaluate the performance of a timber floor construction protected by a ceiling of known fire resistance, when incorporating down lighter light fitting assemblies.</p>
Sampling	<p>Warringtonfire was not involved in the sampling or selection of the tested specimen or any of the components.</p> <p>The results obtained during the test only apply to the test samples as received and tested by Warringtonfire.</p>
Installation	<p>Representatives of Warringtonfire assembled the floor construction and installed the downlighters between the 23rd and 24th February 2021.</p>
Conditioning	<p>The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of 2 days. Throughout this period of time both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 16°C to 21°C and 45.5% to 67% respectively.</p>
Instruction to Test	<p>The test was conducted on the 25th February 2021 at the request of JCC Lighting Products Ltd., the test sponsor.</p>
Ambient Temperature	<p>The ambient air temperature in the vicinity of the test construction was 17°C at the start of the test with a maximum variation of -1°C during the test.</p>
Furnace	<p>The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 2020 Clause 5.1 using eight plate thermometers, distributed over a plane 100 mm from the underside of test assembly.</p>
Thermocouples	<p>Thermocouples were provided to monitor the unexposed surface of the specimen. The output of all instrumentation was recorded at no less than one minute intervals. The locations and reference numbers of the various unexposed surface and internal thermocouples are shown in Figure 1.</p>
Application of the load	<p>The full test load was applied via dead load uniformly distributed over the test Specimen 60 minutes before the commencement of the test.</p>
Loadbearing Capacity Criteria	<p>A linear deflection transducer was provided at the approximate centre on the unexposed surface of the floor to record its vertical deflection.</p>
Furnace Pressure	<p>After the first five minutes of testing and for the remainder of the test, the furnace atmospheric pressure was controlled so that it complied with the requirements of BS EN 1363-1: 2020, clause 5.2.1 The calculated pressure differential relative to the laboratory atmosphere 100 mm below the soffit of the ceiling was 18 (± 5) Pa between 5 and 10 minutes and 18 (± 3) Pa thereafter.</p>

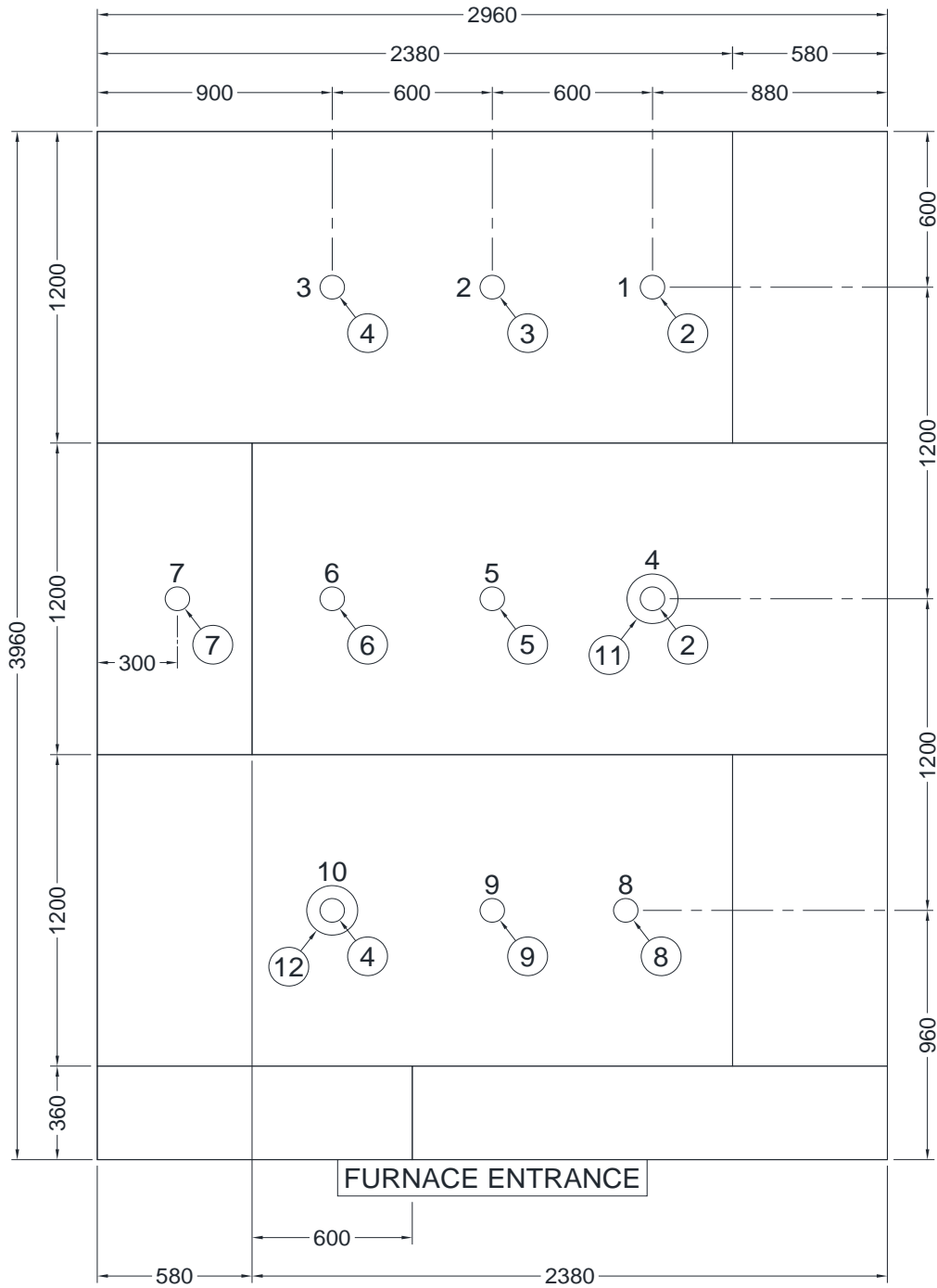
Test Assembly

Figure 1- Plan View of Test Assembly



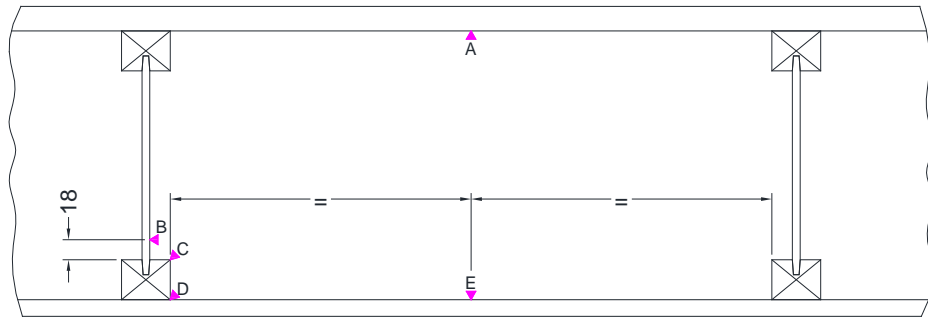
Do not scale. All dimensions are in mm

Figure 2 – Details of Downlighter Positions

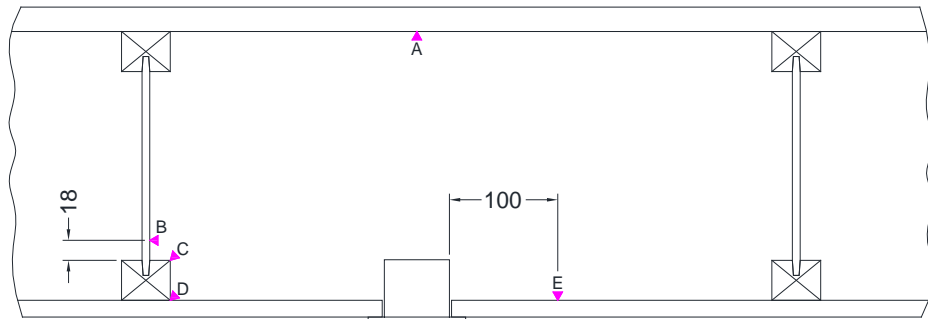


Do not scale. All dimensions are in mm

Figure 3 – Details of Thermocouple Stations



FIRE
STATION A



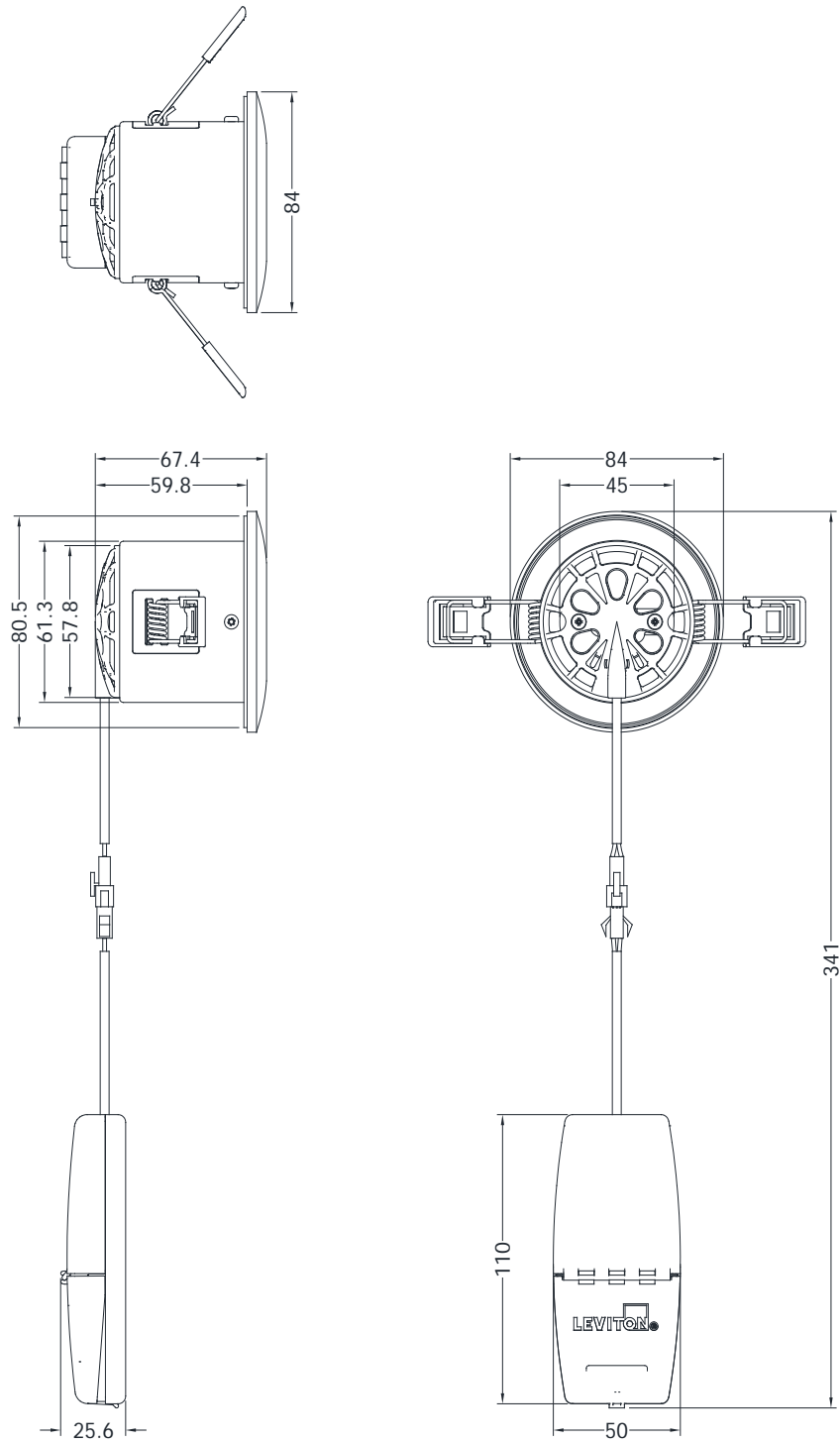
FIRE
STATIONS B - E

THERMOCOUPLE STATIONS

		THERMOCOUPLE				
		A	B	C	D	E
STATION	A	232	233	234	235	236
	B	237	238	239	240	241
	C	242	243	244	245	246
	D	247	248	249	250	251
	E	252	253	254	255	256

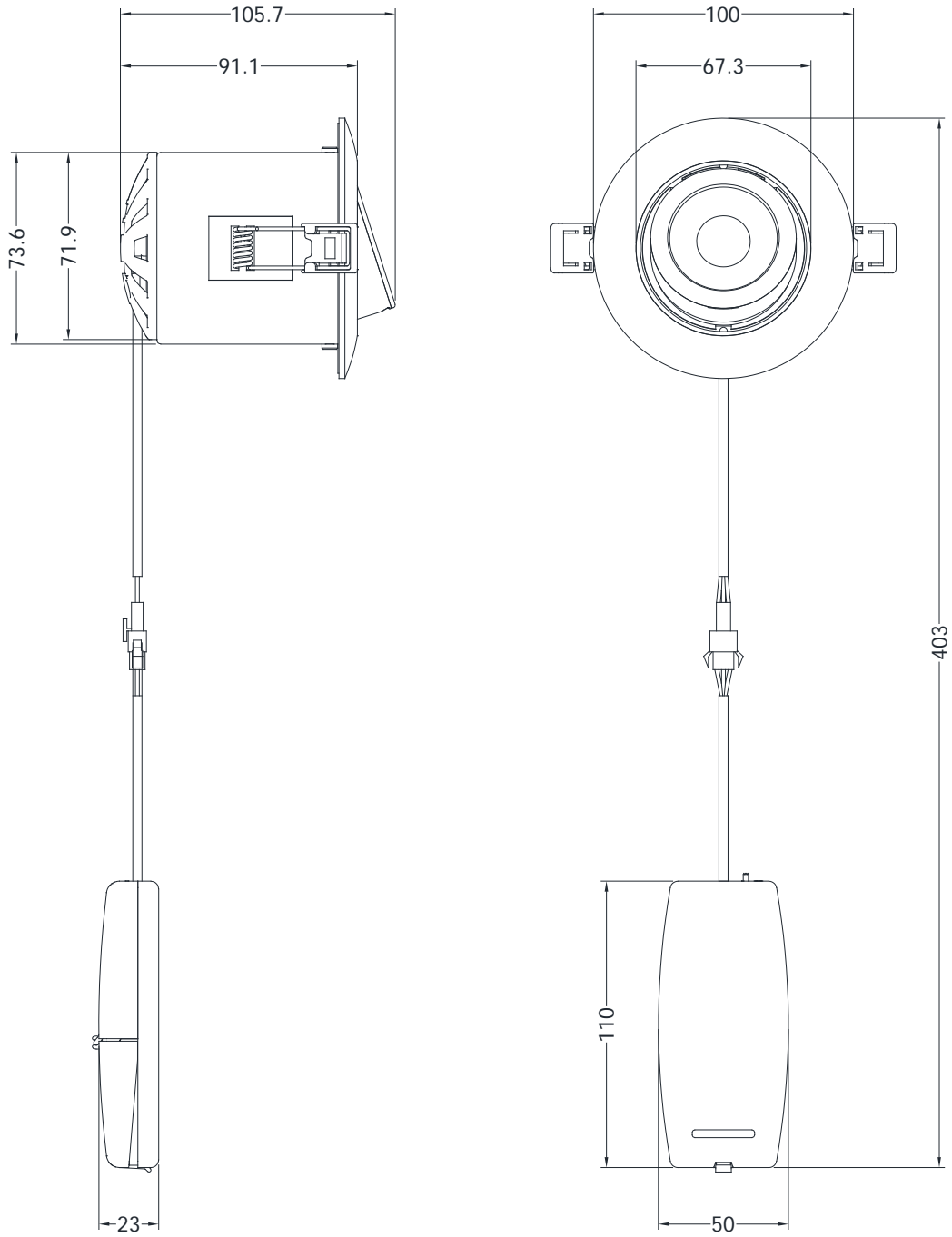
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Figure 4 – Details of Downlighter Specimens 1 & 4



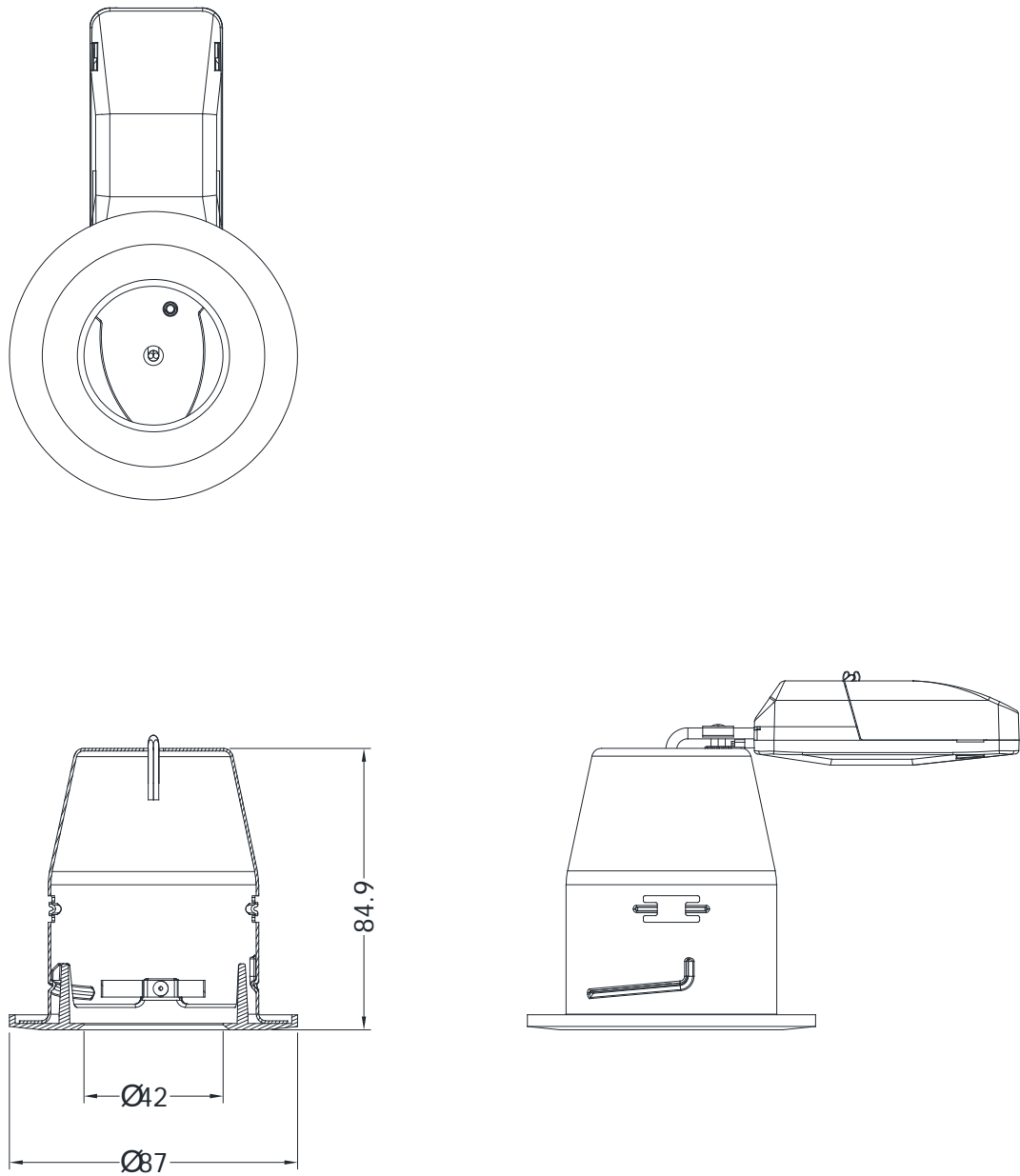
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Figure 5 – Details of Downlighter Specimen 2 & 10



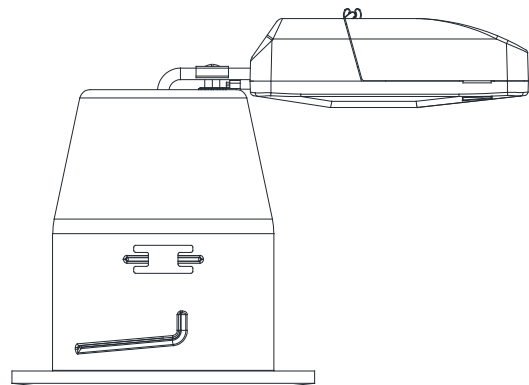
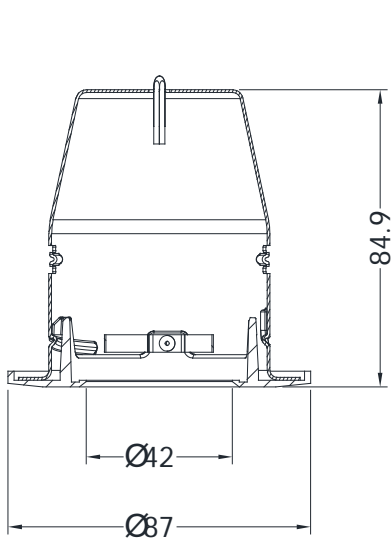
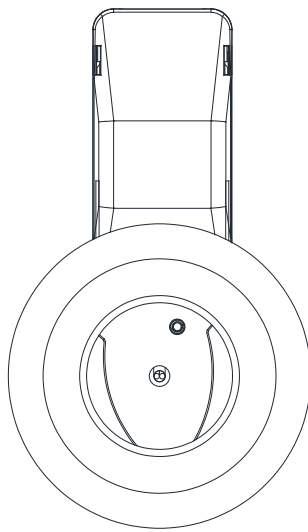
Do not scale. All dimensions are in mm

Figure 6 – Details of Downlighter Specimen 3



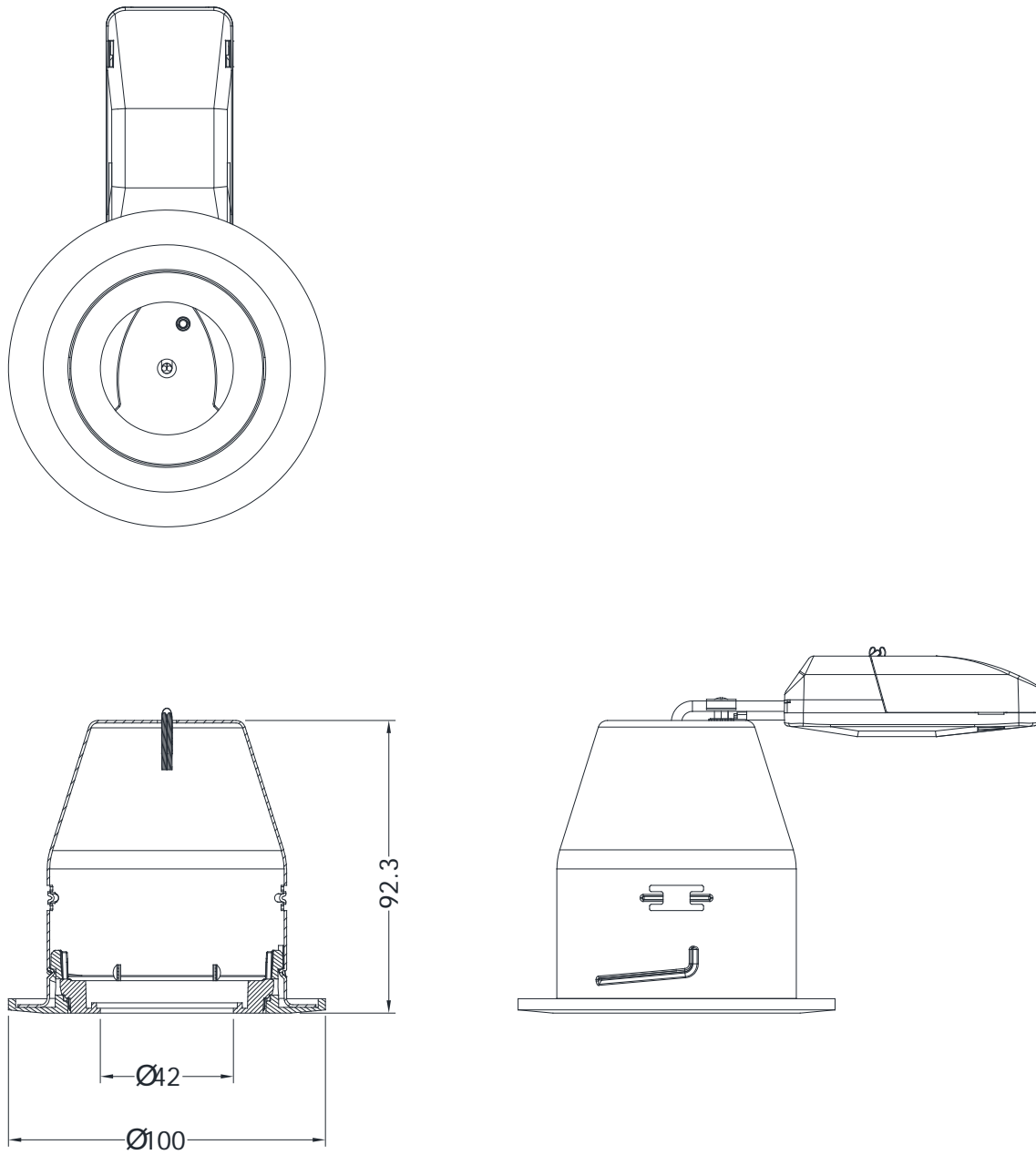
Do not scale. All dimensions are in mm

Figure 7 – Details of Downlighter Specimens 5



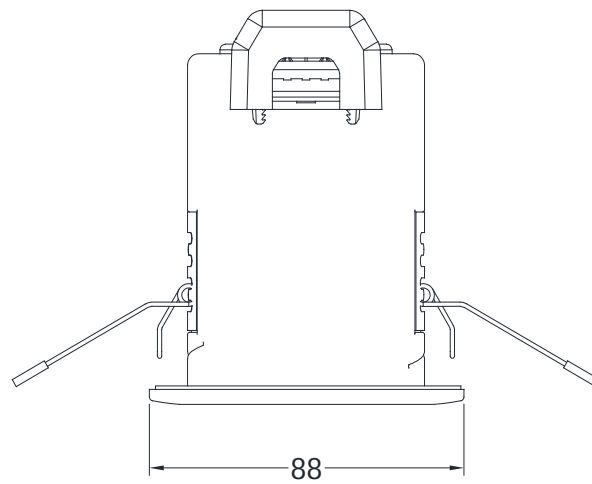
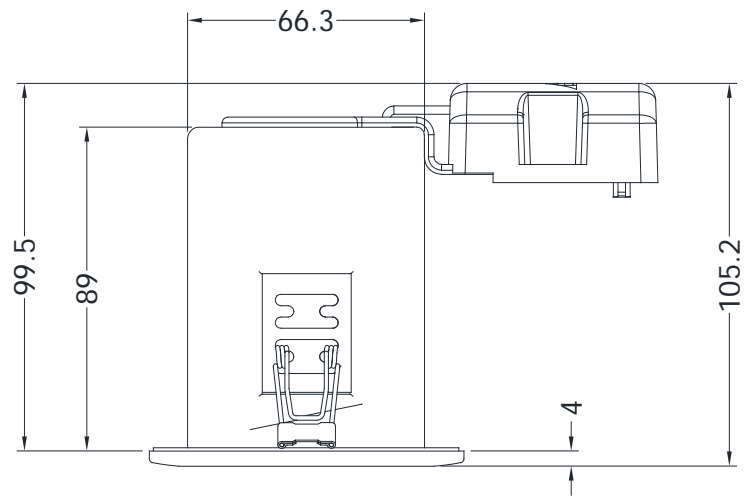
Do not scale. All dimensions are in mm

Figure 8 – Details of Downlighter Specimen 6



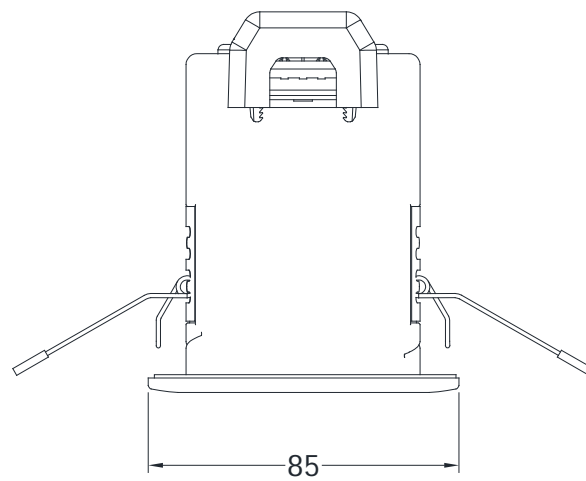
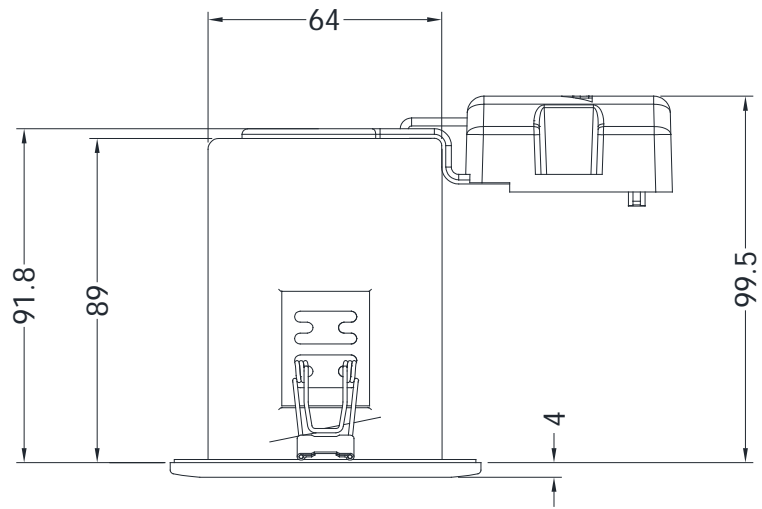
Do not scale. All dimensions are in mm

Figure 9 – Details of Downlighter Specimen 7



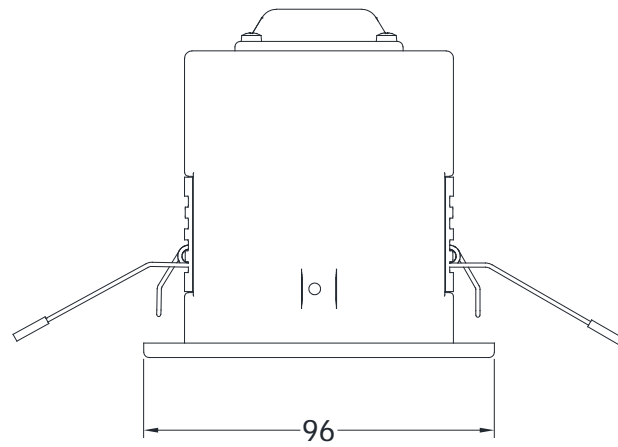
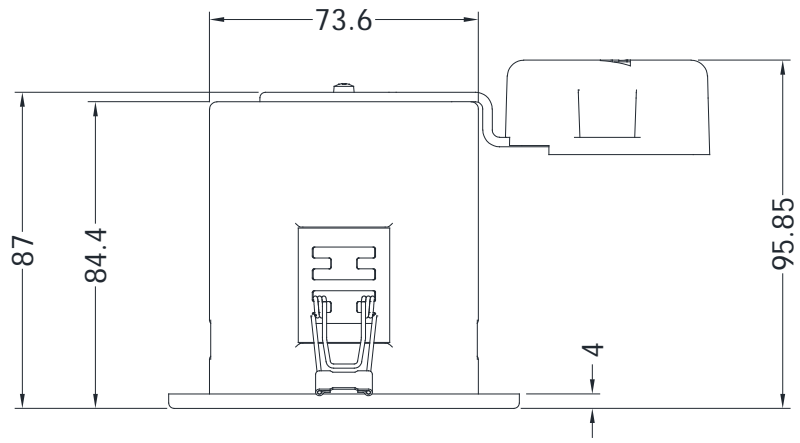
Do not scale. All dimensions are in mm

Figure 10 – Details of Downlighter Specimen 8



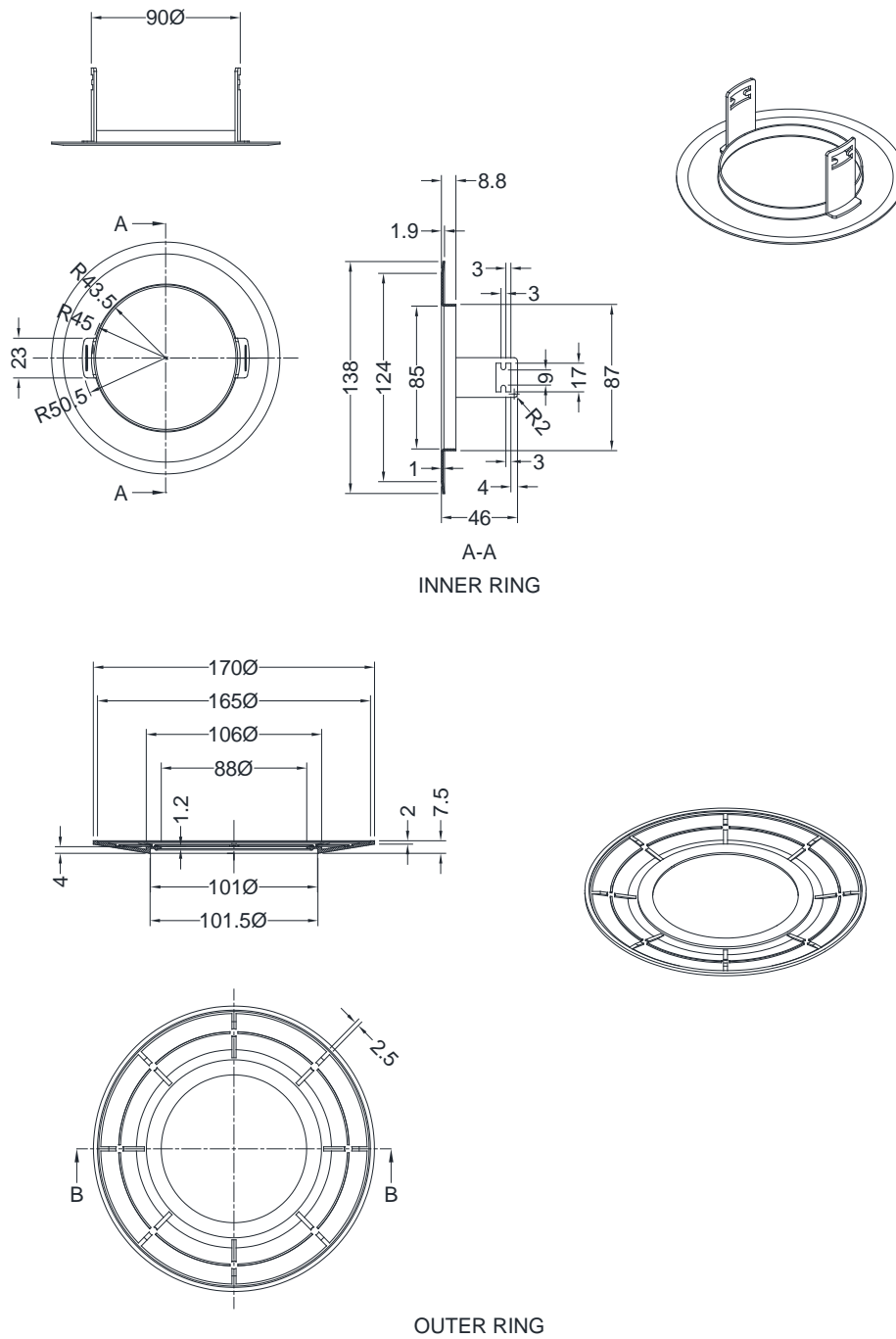
Do not scale. All dimensions are in mm

Figure 11 – Details of Downlighter Specimen 9



Do not scale. All dimensions are in mm

Figure 13 – Details of Converter fitted to Specimen 10



Do not scale. All dimensions are in mm

Schedule of Components

(Refer to Figures 1 to 13)

(All other details are as stated by the sponsor)

<u>Item</u>	<u>Description</u>
1. Timber Floor	
1.1. Engineered-Joints	
Manufacturer	: Metsä Wood UK
Reference	: Finnjoist FJ1 45x220-36
Assembled joist size	: 45 mm wide x 220 mm deep x 4240 mm long
Top and bottom chords	
i. material	: Kerto Laminated Veneer Lumber
ii. density	: 462.7 kg/m ³ , measured
iii. cross section	: 35.3 mm high x 45.6 mm wide x 4240 mm long
Web	
i. material	: Oriented Strand Board, OSB
ii. density	: 591.4 kg/m ³ , measured
iii. cross section	: 173 mm high x 10.1 mm thick x 4240 mm
Centres	: 600 mm, please see Figure 1
1.2. Rim Joists	
i. manufacturer	: Metsä Wood UK
ii. reference	: Kerto-Q
iii. material	: Laminated veneer lumber, LVL
iv. density	: 488.5 kg/m ³ , measured
v. size	: 30.5 mm wide x 220 mm deep x 2980 long
vi. fixing method	: Fitted across the ends of the engineered-joists and fixed with 2 off 100 mm long x 3.2 mm diameter ring shank fired nails to the top and bottom chords of each joist
1.3. Ceiling Closure Block (Notched Section of Rim Board)	
i. manufacturer	: Metsä Wood UK
ii. reference	: Kerto-Q
iii. material	: Laminated veneer lumber, LVL
iv. density	: 448.5 kg/m ³ , measured
v. size	: 30.5 mm wide x 220 mm deep
vi. fixing method	: Fitted Between Finnjoists and through screwed to the top and bottom chords of each joist
1.4. Insulation	
ii. manufacturer	: Rockwool
ii. reference	: ProRox SL 920 UK
iii. material	: Stone wool based insulation board
iv. density	: 45.4 kg/m ³ , measured
v. thickness	: 50 mm
vi. fixing method	: Fitted into the gaps formed by the engineered joists, rim joists & ceiling closure blocks, item 1.1, 1.2 & 1.3 respectively
1.5. Adhesive	
i. manufacturer	: Egger
ii. type	: D4 adhesive
iii. reference	: Joint & Joist Adhesive
iv. curing method	: Air cured
v. application method	: Nozzle

<u>Item</u>	<u>Description</u>
1.6. Floor Boards	
i. material	: Flooring grade tongue and groove chipboards
ii. reference	: FSC E1 P5
iii. thickness	: 22 mm
iv. density	: 660.9 kg/m ³
v. size	: 600 mm wide
vi. fixing method	: Fitted in a single layer and bonded with Egger D4 Floorboard Adhesive to the top chords of each joist and the tops of the rim boards and filler blocks as well as in the tongue and groove of adjoining boards with no additional mechanical fixings used
1.7. Ceiling Boards	
Manufacturer	: British Gypsum
Reference	: Gyproc Wallboard TE
Material	: Type A gypsum complete with strong paper liners
Thickness	: 1 off layer 15 mm thick
Density	: 763.8 kg/m ³ , measured
Fixing method	: The boards were screw fixed to the soffit of the joists with all joints staggered, paper taped and skimmed with British Gypsum jointing compound
Fixings	
i. manufacturer	: Forgefix Ltd
ii. reference	: DWS45BPC
iii. type	: Bugle, Phillips head, drywall screws
iv. overall size	: 45 mm long x 4.2 mm diameter drywall screws
v. centres	: 230 mm centres along joints and 230 mm to the perimeter of the ceiling
2. Specimens 1 & 4	
Manufacturer	: JCC Lighting
References	: V50 JC1001 BN
Overall dimensions and construction	: See Figure 3 for details
Luminaire Details	
i. body materials	: Steel, Heat Sink of extruded aluminium, Lens of Polycarbonate, Rim of Die cast aluminium
ii. diffuser material	: PMMA
iii. diffuser rating	: 650°C
iv. chipset	: SUNPU 2828
v. weight	: 0.29Kg
vi. input voltage	: 230-240V
vii. input frequency	: 50-60Hz
viii. inrush current	: ≤5A 2.2μS
ix. running current	: 175mA
x. electrical class	: II
xi. lamp type	: LED
xii. dimmable	: Yes
xiii. MacAdam steps	: 5
xiv. lumen depreciation	: L70 @ 51,000hrs
xv. LED driver manufacturer	: JCC Lighting
xvi. IP rating	: IP65
xvii. operating temperature	: -5 °C to 25 °C
xviii. correlated colour temperature	: 3000K & 4000k
xix. colour rendering index	: Ra80
xx. forward voltage	: 36V DC

<u>Item</u>	<u>Description</u>
2. Specimens 1 & 4 (Continued)	
Luminaire Details	
xxi. total power	: 7W
xxii. power factor	: 0.9
xxiii. intumescent	: 80 mm x diameter x 1 mm thick graphite based intumescent
xxiv. sealing ring	: 10 mm x wide x 1 mm thick silicone rubber based seal
xxv. cut out size	: 70 mm
3. Specimens 2 & 10	
Manufacturer	: JCC Lighting
Reference	: V50 Tilt JC1002 CH
Overall dimensions and construction	: See Figure 6 for details
Luminaire Details	
i. body materials	: Steel, Heat Sink of extruded aluminium, Lens of Polycarbonate, Rim of Die cast aluminium
ii. diffuser material	: PMMA
iii. diffuser rating	: 650°C
iv. chipset	: SUNPU 2828
v. weight	: 0.46Kg
vi. input voltage	: 230-240V
vii. input frequency	: 50-60Hz
viii. inrush current	: ≤5A 2.2μS
ix. running current	: 175mA
x. electrical class	: II
xi. lamp type	: LED
xii. dimmable	: Yes
xiii. MacAdam steps	: 5
xiv. lumen depreciation	: L70 @ 51,000hrs
xv. LED driver manufacturer	: JCC Lighting
xvi. IP rating	: IP65
xvii. operating temperature	: -5 °C to 25 °C
xviii. correlated colour temperature	: 3000K & 4000k
xix. colour rendering index	: Ra80
xx. forward voltage	: 36V DC
xxi. total power	: 7W
xxii. power factor	: 0.9
xxiii. intumescent	: 92 mm x diameter x 1 mm thick graphite based intumescent (top of can)
xxiv. sealing ring	: 10 mm x wide x 1 mm thick silicone rubber based seal
xxv. cut out size	: 85 mm
3. Specimen 3	
Manufacturer	: JCC Lighting
Reference	: JC010010 WH
Overall dimensions and construction	: See Figure 4 for details
Luminaire Details	
i. body materials	: Mild Steel
ii. bezel materials	: Die Cast Aluminium
iii. weight	: 0.24kg
iv. input voltage	: 220-240vAC
v. electrical class	: Class I
vi. lamp type	: GU10 Cap

<u>Item</u>	<u>Description</u>
3. Specimen 3 (Continued)	
Luminaire Details	
vii. maximum lamp size	: LED GU10 Lamps Only – 10W
viii. IP rating	: IP20
ix. operating temperature	: Ambient 26°C
x. sealing ring	: 9.5 mm wide x 1 mm thick silicone rubber based seal
xi. cut out size	: 72 mm
4. Specimen 5	
Manufacturer	: JCC Lighting
Reference	: JC010016 WH
Overall dimensions and construction	: See Figure 9 for details
Luminaire Details	
i. body materials	: Mild Steel
ii. bezel materials	: Die Cast Aluminium
iii. weight	: 0.30kg
iv. input voltage	: 220-240vAC
v. electrical class	: Class I
vi. lamp type	: GU10 Cap
vii. maximum lamp size	: LED GU10 Lamps Only – 10W
viii. IP rating	: IP65
ix. operating temperature	: Ambient 26°C
x. sealing ring	: 9.5 mm wide x 1 mm thick silicone rubber based seal
xi. cut out size	: 72 mm
6. Specimen 6	
Manufacturer	: JCC Lighting
Reference	: JC010023 WH
Overall dimensions and construction	: See Figure 10 for details
Luminaire Details	
i. body materials	: Mild Steel
ii. bezel materials	: Die Cast Aluminium
iii. weight	: 0.30kg
iv. input voltage	: 220-240vAC
v. electrical class	: Class I
vi. lamp type	: GU10 Cap
vii. maximum lamp size	: LED GU10 Lamps Only – 10W
viii. IP rating	: IP65
ix. operating temperature	: Ambient 26°C
x. sealing ring	: 9.5 mm wide x 1 mm thick silicone rubber based seal
xi. cut out size	: 84 mm
7. Specimen 7	
Manufacturer	: JCC Lighting
References	: JC94110
Overall dimensions and construction	: See Figure 8 for details
Luminaire Details	
i. body materials	: Mild Steel
ii. bezel materials	: Die Cast Aluminium
iii. weight	: 0.27kg
iv. input voltage	: 220-240vAC
v. electrical class	: Class I
vi. lamp type	: GU10 Cap

<u>Item</u>	<u>Description</u>
7. Specimen 7 (Continued)	
Luminaire Details	
vii. maximum lamp size	: GU10 Lamps Only
viii. IP rating	: IP65
ix. operating temperature	: Ambient 26°C
x. sealing ring	: 8 mm wide x 1 mm thick silicone rubber based seal
xi. cut out size	: 74 mm
8. Specimen 8	
Manufacturer	: JCC Lighting
References	: JC94113
Overall dimensions and construction	: See Figure 9 for details
Luminaire Details	
i. body materials	: Mild Steel
ii. bezel materials	: Die Cast Aluminium
iii. weight	: 0.25kg
iv. input voltage	: 220-240vAC
v. electrical class	: Class I
vi. lamp type	: GU10 Cap
vii. maximum lamp size	: GU10 Lamps Only
viii. IP rating	: IP20
ix. operating temperature	: Ambient 26°C
x. sealing ring	: 8 mm wide x 1 mm thick silicone rubber based seal
xi. cut out size	: 74 mm
9. Specimen 9	
Manufacturer	: JCC Lighting
References	: JC94114
Overall dimensions and construction	: See Figure 10 for details
Luminaire Details	
i. body materials	: Mild Steel
ii. bezel materials	: Die Cast Aluminium
iii. weight	: 0.32kg
iv. input voltage	: 220-240vAC
v. electrical class	: Class I
vi. lamp type	: GU10 Cap
vii. maximum lamp size	: GU10 Lamps
viii. IP rating	: IP20
ix. operating temperature	: Ambient 26°C
x. sealing ring	: 8 mm wide x 1 mm thick silicone rubber based seal
xi. cut out size	: 85 mm
10. Converter Plate	
Manufacturer	: JCC Lighting
Reference	: JC1003 BN
Materials	
i. inner ring	: Steel
ii. outer ring	: Steel
Overall sizes	: See Figure 11 for details

Item**Description****10. Converter Plate (Continued)**

Fitting methods

- i. inner ring : Snap fitted into existing aperture in ceiling
- ii. outer ring : Slip fitted over new lighting unit, specimen 4, item 2, and retained when unit is fitted into inner ring

11. Converter Plate

Manufacturer

: JCC Lighting

Reference

: JC1004 BN

Materials

i. inner ring

: Steel

ii. outer ring

: Steel

Overall sizes

: See Figure 12 for details

Fitting methods

i. inner ring

: Snap fitted into existing aperture in ceiling

ii. outer ring

: Slip fitted over new lighting unit, specimen 10, item 3, and retained when unit is fitted into inner ring

Test Observations

Time		All observations are from the exposed face unless noted otherwise.
mins	secs	
-60	00	Load applied.
00	00	The test commences.
02	30	Bright flames spread across the surface of the ceiling.
04	30	Glowing embers visible as the paper layer of plasterboard burns away.
07	30	The jointing compound/tape is starting to burn away and drop out.
09	00	Light fitting 5 has detached from the ceiling.
09	30	Light fitting 3 is flaming.
10	00	Light fitting 6 is flaming.
10	30	All light fittings are now flaming.
11	30	Light fitting 3 has detached.
13	30	The long edges of the ceiling boards are beginning to ripple.
14	30	The plasterboard is glowing bright red/orange.
16	00	Gaps in the plasterboard joints are beginning to open.
20	30	Gaps in plasterboard joints continue to open to approximately 10mm.
23	00	The plasterboard sections are starting to sag into the furnace.
26	00	Gaps where boards have sagged open to approximately 20mm.
27	00	Flaming has occurred through the gaps in the plasterboard.
29	00	Plasterboard has now sagged to approximately 60mm into the furnace.
30	00	Sections of plasterboard have detached from ceiling and furnace has become engulfed in flames. The Specimen is maintaining its loadbearing capacity, integrity and insulation criteria.
32	00	Slight smoke release from joints in the floor boards of non-exposed face.
33	00	Test discontinued for safety as the deflection rate is rising rapidly.

Test Photographs

The exposed face of the floor assembly prior to test



The unexposed face of the floor assembly prior to test



The unexposed face of the floor assembly after 15 minutes of testing



The unexposed face of the floor assembly after 30 minutes of testing



Temperature, Pressure and Deflection Data

Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In The Standard BS EN 1363-1: 2020

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	40
1	349	303
2	445	451
3	502	532
4	544	535
5	576	569
6	603	594
7	626	620
8	646	643
9	663	660
10	678	680
11	693	691
12	706	706
13	717	717
14	728	726
15	739	739
16	748	750
17	757	757
18	766	765
19	774	773
20	781	782
21	789	792
22	796	799
23	802	803
24	809	809
25	815	818
26	820	821
27	826	826
28	832	832
29	837	837
30	842	857
31	847	860
32	852	862
33	856	865

Individual Temperatures And Mean Recorded On The Unexposed Surface Of The Floor

Time Mins	T/C Number 211 Deg. C	T/C Number 212 Deg. C	T/C Number 213 Deg. C	T/C Number 214 Deg. C	T/C Number 215 Deg. C	Mean Temp Deg. C
0	19	20	20	18	16	19
1	19	20	20	18	16	19
2	19	20	20	18	16	19
3	19	20	20	18	16	19
4	19	20	20	18	16	19
5	19	20	20	18	16	19
6	19	20	20	18	16	19
7	19	20	20	*	*	20
8	20	20	20	*	*	20
9	20	21	20	*	*	20
10	21	21	21	*	*	21
11	21	22	22	*	*	22
12	22	23	22	*	*	22
13	23	23	23	*	*	23
14	23	24	24	*	*	24
15	24	25	25	*	*	25
16	25	26	25	*	*	25
17	26	27	26	*	*	26
18	27	28	27	*	*	27
19	28	28	28	*	*	28
20	28	29	29	*	*	29
21	29	30	29	*	*	29
22	30	31	30	*	*	30
23	31	32	31	*	*	31
24	32	33	32	*	*	32
25	33	33	32	*	*	33
26	34	34	33	*	*	34
27	34	35	34	*	*	34
28	35	36	35	*	*	35
29	36	37	37	*	*	37
30	37	38	40	*	*	38
31	40	41	44	*	*	42
32	50	49	52	*	*	50
33	62	61	57	*	*	60

* Indicates Thermocouple Malfunction

Individual Temperatures Recorded On The Unexposed Surface Of The Specimen Adjacent to Joints In The Floor

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number
	216 Deg. C	217 Deg. C	218 Deg. C	219 Deg. C	220 Deg. C	221 Deg. C
0	20	19	19	20	20	20
1	20	19	19	20	20	20
2	20	19	19	20	20	20
3	20	19	19	20	20	20
4	20	19	19	20	20	20
5	20	19	19	20	20	20
6	20	19	19	20	20	20
7	20	19	19	20	20	20
8	20	19	19	20	20	20
9	21	20	19	20	20	20
10	21	20	19	21	20	20
11	22	20	20	22	21	21
12	23	20	20	22	21	21
13	23	20	20	23	21	21
14	24	21	20	24	22	22
15	25	21	21	24	22	22
16	26	22	21	25	23	23
17	26	22	21	26	23	23
18	27	23	22	27	24	23
19	28	23	22	28	24	24
20	29	24	23	29	25	25
21	30	24	23	29	25	25
22	31	25	24	30	26	25
23	31	25	24	31	27	26
24	32	26	25	32	27	27
25	33	27	25	33	28	27
26	34	27	26	34	29	28
27	35	28	26	34	29	28
28	36	29	27	35	30	29
29	37	29	28	36	31	29
30	38	30	28	37	31	30
31	39	31	29	47	32	33
32	41	32	31	55	32	44
33	43	33	34	61	33	51

Individual Temperatures Recorded At Mid-Height Of The Cavity Coincidental With The Light Fittings

Time Mins	T/C Number 222 Deg. C	T/C Number 223 Deg. C	T/C Number 224 Deg. C	T/C Number 225 Deg. C	T/C Number 226 Deg. C
0	21	21	21	22	22
1	21	21	22	22	23
2	31	31	30	28	35
3	47	47	47	46	51
4	54	53	53	55	62
5	57	56	57	59	72
6	61	60	61	63	78
7	64	64	67	67	83
8	69	69	72	68	88
9	78	75	78	72	98
10	83	81	88	75	104
11	88	87	98	87	111
12	90	89	100	93	112
13	95	95	105	99	115
14	98	103	109	108	114
15	102	111	111	110	115
16	106	118	106	113	122
17	108	120	111	111	128
18	107	118	113	110	126
19	112	132	118	112	131
20	115	125	124	119	148
21	130	136	136	134	167
22	152	156	153	147	186
23	171	173	172	162	204
24	183	187	182	181	229
25	195	200	191	194	235
26	206	209	203	207	249
27	214	219	210	219	258
28	226	227	220	229	265
29	230	236	231	243	277
30	240	244	329	383	305
31	369	355	371	680	724
32	593	389	392	738	767
33	718	412	408	760	773

Individual Temperatures Recorded At Mid-Height Of The Cavity Coincidental With The Light Fittings

Time Mins	T/C Number 227 Deg. C	T/C Number 228 Deg. C	T/C Number 229 Deg. C	T/C Number 230 Deg. C	T/C Number 231 Deg. C
0	22	22	27	23	22
1	23	22	27	23	22
2	31	29	31	33	30
3	50	49	50	52	50
4	56	57	57	60	57
5	62	61	61	63	62
6	68	66	65	67	66
7	74	71	69	71	70
8	83	76	74	77	75
9	93	82	71	89	80
10	101	89	93	97	88
11	106	97	100	101	91
12	109	104	106	107	94
13	111	109	109	106	98
14	115	110	108	111	103
15	115	106	110	116	106
16	120	114	115	117	111
17	120	109	117	121	113
18	122	114	123	118	115
19	146	124	121	125	124
20	139	131	128	130	126
21	156	138	136	148	128
22	181	147	151	166	143
23	207	165	174	185	172
24	222	179	200	207	199
25	226	203	217	222	214
26	243	224	227	242	223
27	247	229	245	255	242
28	267	242	259	264	248
29	271	249	266	277	258
30	715	252	765	454	338
31	692	258	765	758	367
32	705	271	769	789	385
33	722	277	788	781	703

Individual Temperatures Recorded On The Joists And The Internal Faces Of The Floorboard And Plasterboard As Shown In Figure 3 At Station A

Time Mins	T/C Number 232 Deg. C	T/C Number 233 Deg. C	T/C Number 234 Deg. C	T/C Number 235 Deg. C	T/C Number 236 Deg. C
0	20	21	21	22	22
1	20	21	21	22	23
2	21	21	22	23	42
3	27	25	27	30	69
4	35	33	36	40	82
5	42	40	43	47	86
6	48	47	49	53	87
7	53	53	54	58	89
8	57	58	59	63	90
9	60	61	62	65	91
10	63	65	65	68	92
11	65	67	68	70	93
12	67	70	70	73	96
13	70	73	73	75	100
14	72	75	75	77	104
15	74	77	77	80	110
16	76	79	79	82	115
17	77	81	81	83	118
18	79	*	83	85	120
19	80	*	84	86	123
20	81	86	86	88	127
21	83	87	87	90	134
22	85	88	88	91	139
23	86	90	89	94	156
24	88	91	91	98	183
25	91	93	93	104	217
26	93	96	96	111	251
27	95	99	98	118	280
28	96	101	101	126	303
29	101	105	105	135	322
30	107	111	109	145	336
31	113	117	115	155	345
32	120	123	121	166	351
33	131	132	129	177	356

* Indicates Thermocouple Malfunction

Individual Temperatures Recorded On The Joists And The Internal Faces Of The Floorboard And Plasterboard As Shown In Figure 3 At Station B

Time Mins	T/C Number 237 Deg. C	T/C Number 238 Deg. C	T/C Number 239 Deg. C	T/C Number 240 Deg. C	T/C Number 241 Deg. C
0	21	21	21	31	24
1	21	21	21	30	25
2	24	22	22	32	52
3	39	26	27	39	77
4	52	34	35	47	86
5	58	41	42	54	89
6	64	49	48	59	90
7	69	55	54	64	91
8	73	61	59	69	91
9	75	64	63	73	93
10	78	69	67	76	95
11	82	72	70	79	97
12	85	75	73	82	101
13	89	77	76	84	107
14	94	80	79	87	111
15	101	82	81	89	116
16	107	84	83	91	110
17	111	85	84	92	113
18	116	86	86	88	121
19	120	88	87	90	129
20	124	89	88	91	138
21	130	90	89	93	148
22	138	91	91	96	175
23	150	93	92	100	215
24	165	96	95	106	253
25	183	100	98	113	287
26	206	104	101	120	313
27	233	109	106	128	334
28	255	115	113	139	351
29	275	120	121	151	366
30	308	143	144	177	387
31	841	280	285	364	786
32	852	442	460	534	826
33	873	641	645	726	839

Individual Temperatures Recorded On The Joists And The Internal Faces Of The Floorboard And Plasterboard As Shown In Figure 3 At Station C

Time Mins	T/C Number 242 Deg. C	T/C Number 243 Deg. C	T/C Number 244 Deg. C	T/C Number 245 Deg. C	T/C Number 246 Deg. C
0	21	20	20	21	21
1	21	20	20	21	21
2	24	21	22	24	35
3	31	27	28	32	52
4	43	35	36	42	59
5	52	43	44	49	68
6	60	51	50	55	71
7	65	57	56	60	73
8	68	61	60	63	75
9	70	64	63	66	77
10	73	67	67	69	81
11	75	70	70	72	85
12	77	73	73	75	89
13	79	75	76	78	92
14	81	77	78	80	96
15	84	79	81	82	100
16	87	81	83	84	104
17	89	83	84	86	108
18	90	84	85	88	113
19	91	86	87	89	116
20	93	87	88	91	123
21	95	88	89	93	139
22	99	90	90	97	161
23	107	92	93	103	184
24	117	94	95	109	212
25	126	97	97	117	230
26	139	103	101	125	246
27	151	110	107	137	257
28	163	115	113	150	267
29	176	122	120	165	279
30	187	130	129	178	298
31	386	296	292	414	873
32	554	432	455	555	862
33	635	524	539	634	867

Individual Temperatures Recorded On The Joists And The Internal Faces Of The Floorboard And Plasterboard As Shown In Figure 3 At Station D

Time Mins	T/C Number 247 Deg. C	T/C Number 248 Deg. C	T/C Number 249 Deg. C	T/C Number 250 Deg. C	T/C Number 251 Deg. C
0	20	21	21	22	23
1	20	21	21	22	24
2	22	22	23	23	48
3	30	28	30	30	73
4	38	36	38	42	84
5	47	43	45	51	87
6	53	51	51	57	89
7	58	57	57	63	90
8	62	62	62	66	91
9	66	66	67	69	92
10	69	70	70	72	94
11	72	73	73	74	95
12	74	75	76	78	97
13	77	77	79	80	101
14	79	79	81	82	107
15	81	81	83	85	112
16	83	83	85	87	115
17	85	85	87	89	118
18	86	87	88	91	122
19	87	88	90	92	126
20	89	90	91	94	132
21	91	91	92	96	139
22	93	92	93	99	159
23	96	95	96	104	193
24	103	99	101	111	235
25	114	103	106	119	269
26	122	110	111	127	299
27	136	117	117	141	321
28	151	126	128	158	339
29	166	133	139	175	353
30	272	210	208	273	701
31	475	400	416	504	778
32	572	479	505	574	792
33	624	533	565	623	800

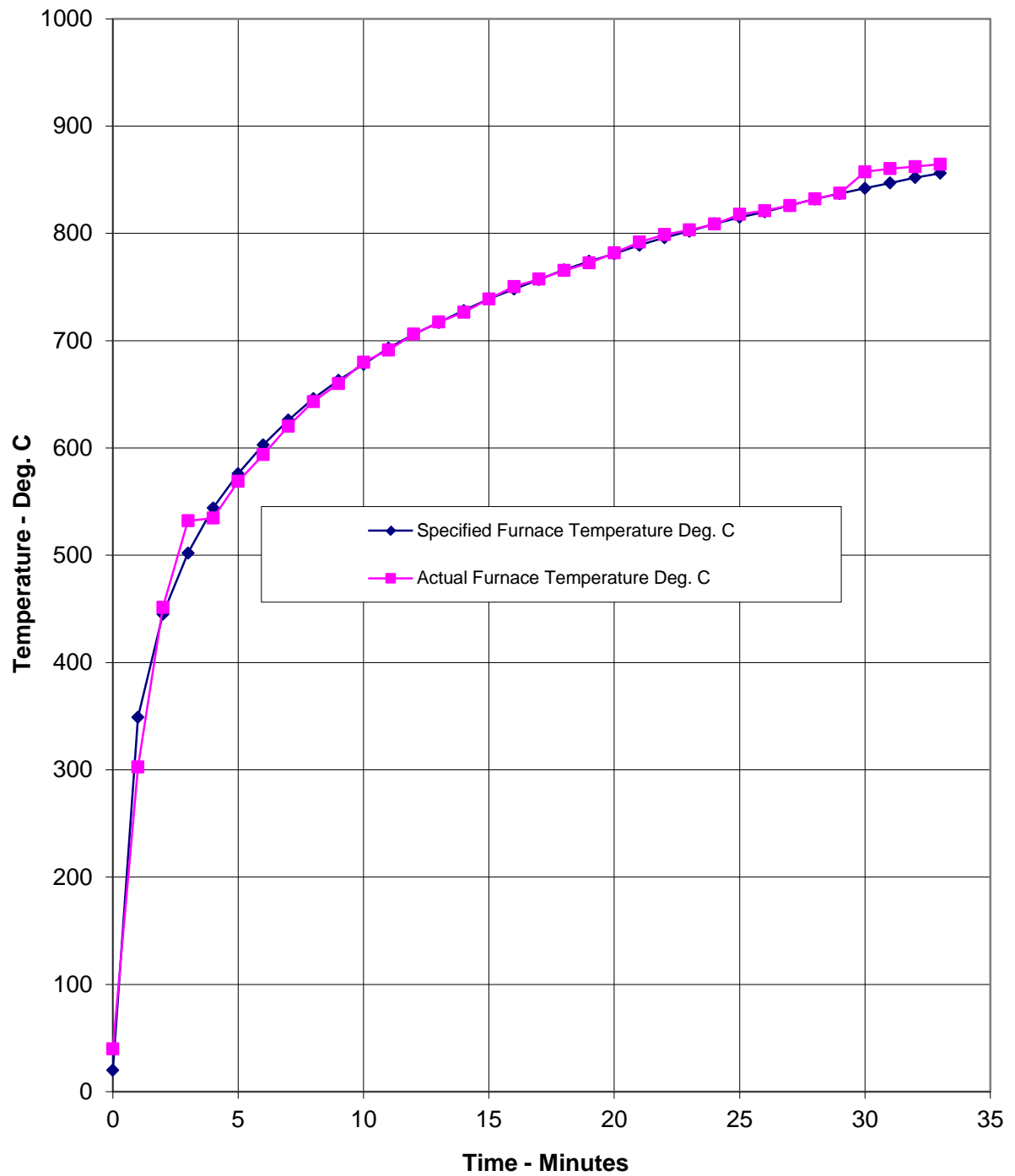
Individual Temperatures Recorded On The Joists And The Internal Faces Of The Floorboard And Plasterboard As Shown In Figure 3 At Station E

Time Mins	T/C Number 252 Deg. C	T/C Number 253 Deg. C	T/C Number 254 Deg. C	T/C Number 255 Deg. C	T/C Number 256 Deg. C
0	21	21	22	22	24
1	21	21	22	22	24
2	23	22	23	23	44
3	30	26	28	27	73
4	41	35	38	35	83
5	48	42	44	41	85
6	53	47	49	47	86
7	57	52	53	53	87
8	61	56	58	58	88
9	64	60	61	62	89
10	67	63	64	64	90
11	69	66	67	68	92
12	71	69	70	70	94
13	74	72	72	73	98
14	76	74	75	75	103
15	78	76	77	77	108
16	80	78	79	79	113
17	81	79	81	81	116
18	82	81	82	83	119
19	83	83	83	84	122
20	84	84	84	86	127
21	85	85	86	87	133
22	87	86	87	89	141
23	89	88	88	90	165
24	91	89	90	92	201
25	94	90	92	94	236
26	98	92	94	98	269
27	105	94	97	104	296
28	114	95	99	110	317
29	123	99	101	114	333
30	136	105	105	119	343
31	149	112	111	127	350
32	161	117	118	137	356
33	171	125	126	148	359

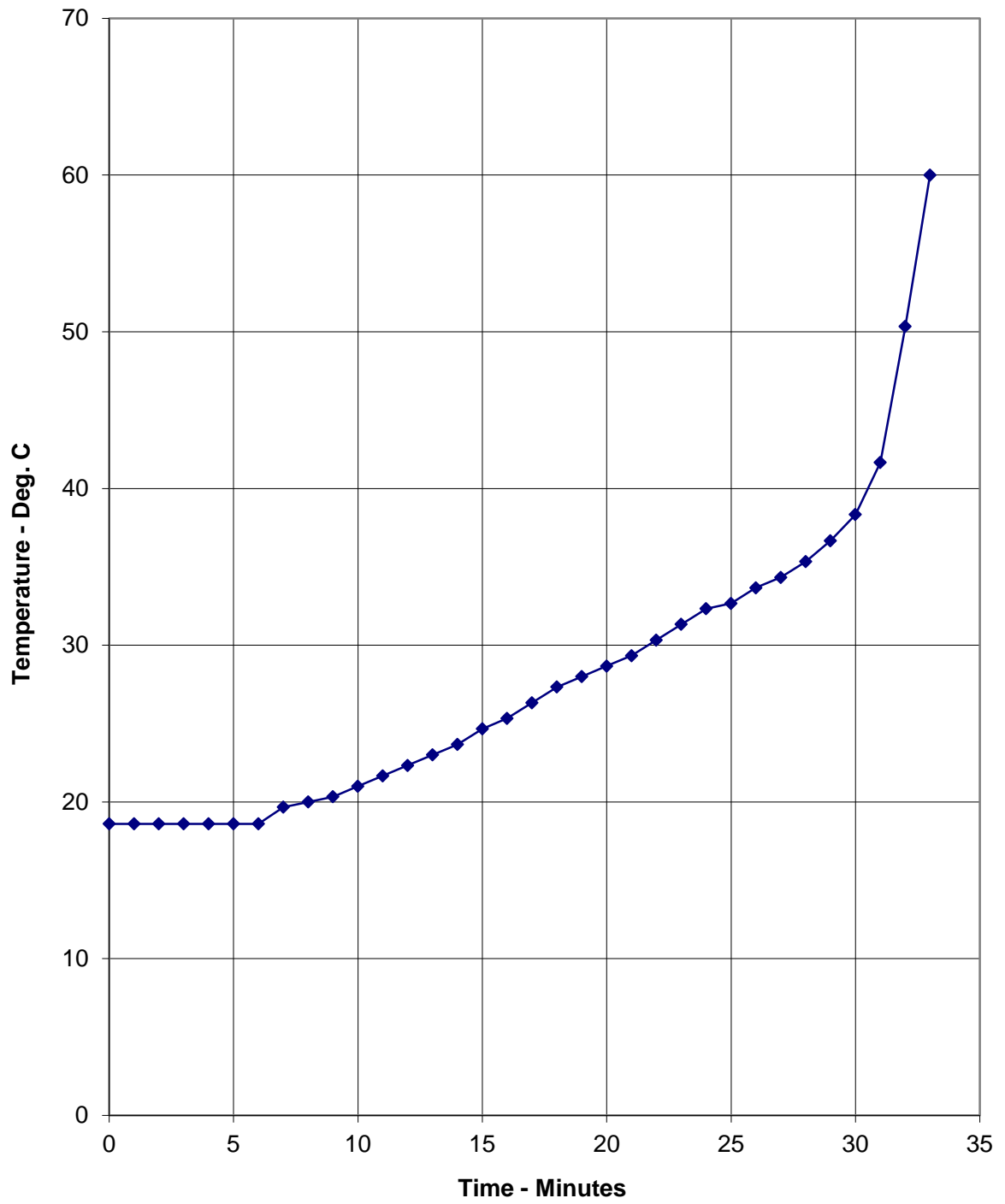
Central Vertical Deflection Of The Floor

Time Mins	Central Vertical Deflection mm	Rate Of Deflection mm/min
0	0.000	0.000
1	1.326	1.880
2	1.494	0.168
3	1.594	0.101
4	1.594	0.000
5	1.762	0.168
6	1.980	0.218
7	2.148	0.168
8	2.367	0.218
9	2.585	0.218
10	2.803	0.218
11	2.920	0.117
12	3.189	0.269
13	3.407	0.218
14	3.625	0.218
15	3.911	0.285
16	3.961	0.050
17	4.297	0.336
18	4.616	0.319
19	4.851	0.235
20	5.841	0.990
21	6.059	0.218
22	6.210	0.151
23	6.496	0.285
24	6.764	0.269
25	6.982	0.218
26	6.982	0.000
27	7.049	0.067
28	7.049	0.000
29	7.150	0.101
30	7.587	0.436
31	11.615	4.028
32	25.530	13.915
33	54.014	28.484

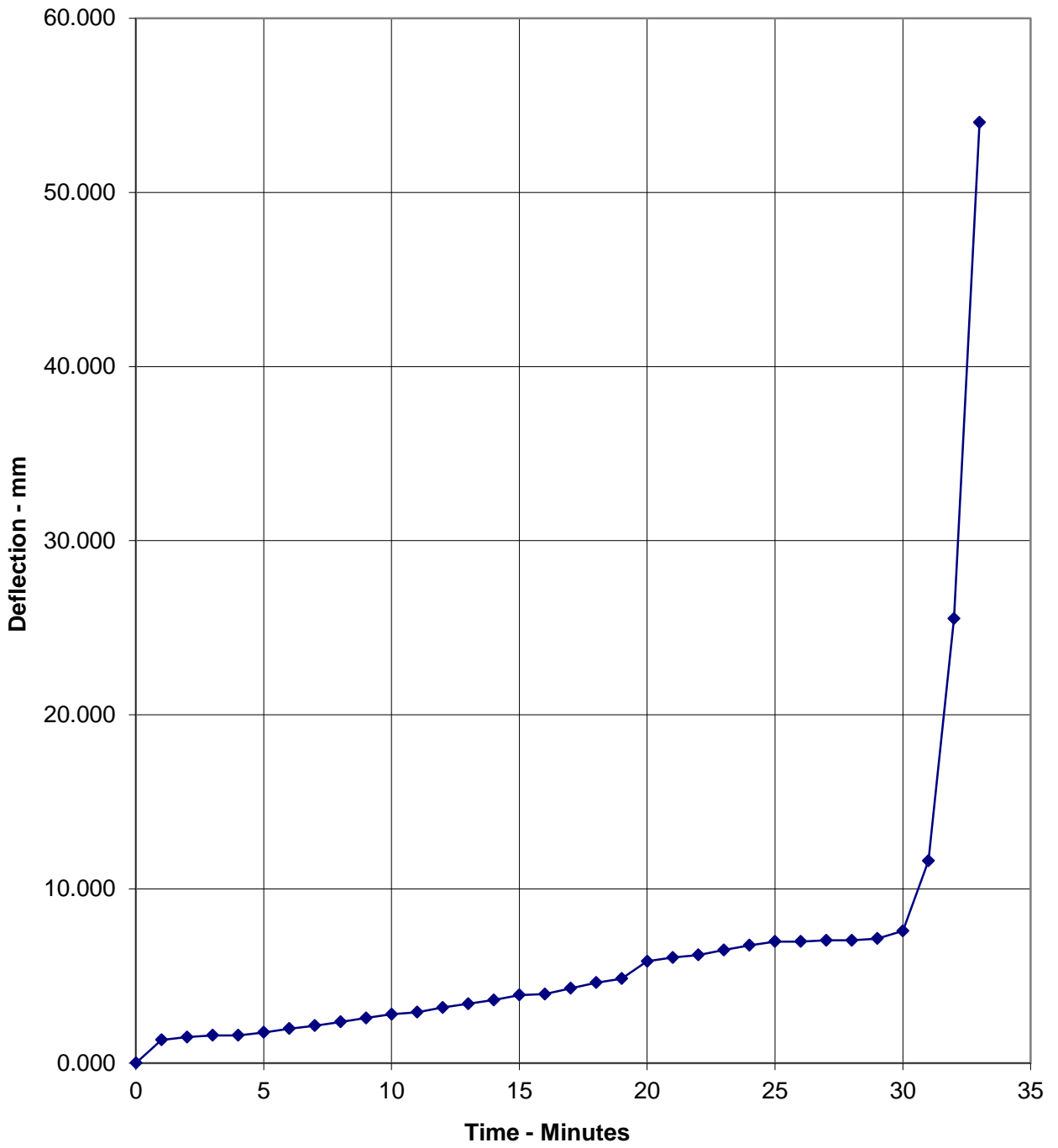
Graph Showing Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In The Standard



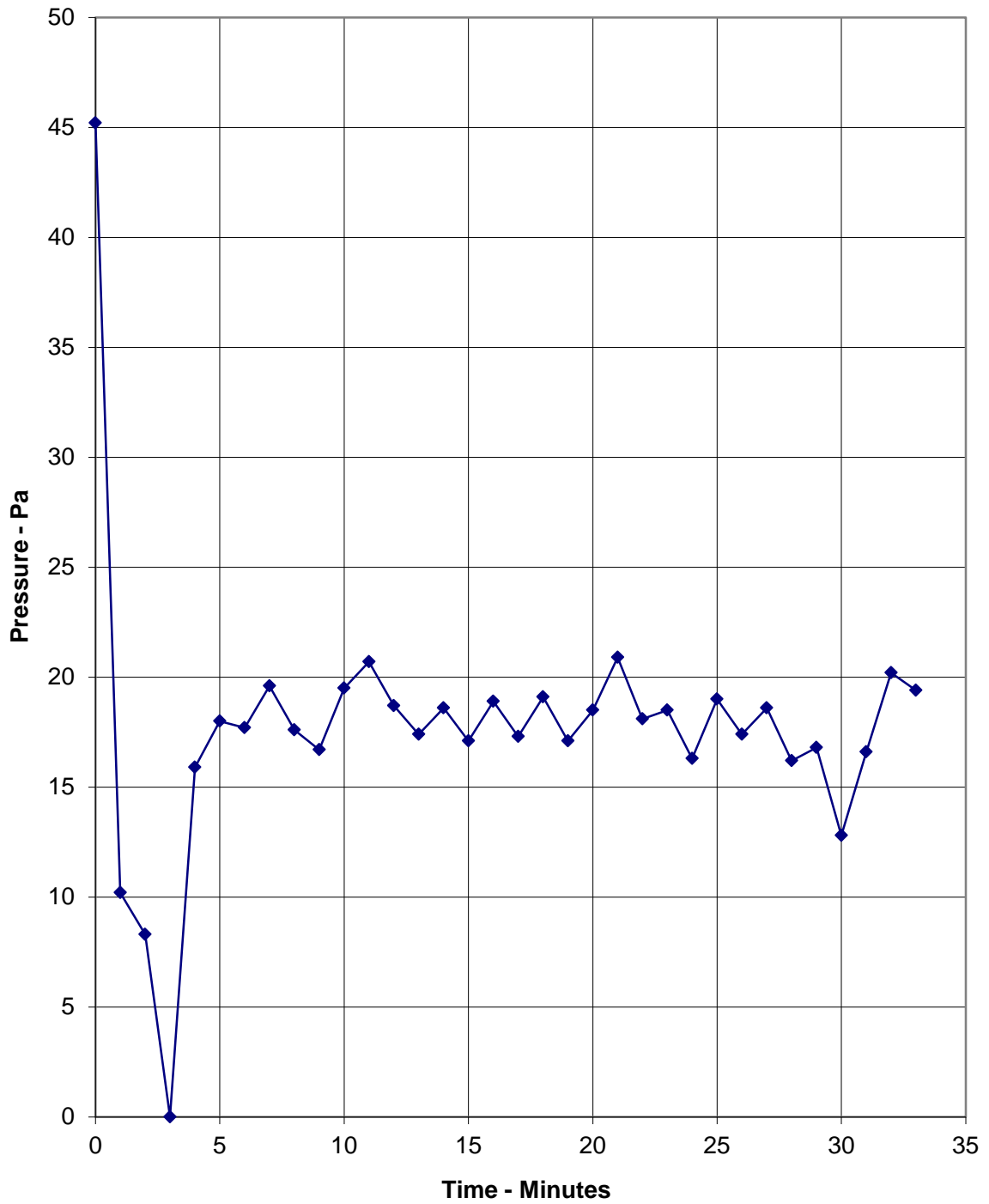
Graph Showing Mean Temperature Recorded On The Unexposed Surface Of The Specimen



Graph Showing The Recorded Vertical Deflection At The Centre Of The Specimen



Graph Showing Recorded Furnace Pressure 100 mm Below The Underside Of The Specimen



On-going Implications

Limitations

This report details the method of construction, the test conditions and the results obtained when the specific elements of construction described herein were tested following the procedure outlined in BS EN 1363-1: 2020, and where appropriate BS EN 1363-2: 1999. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report. Annex A of BS EN 1363-1: 2020, provides guidance information on the application of fire resistance tests and the interpretation of test data.

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

EGOLF

Certain aspects of some fire test specifications are open to different interpretations. EGOLF have identified a number of such areas and have agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Groups. Where such Resolutions are applicable to this test they have been followed

Field of Direct Application

The results are directly applicable to a similar untested floor construction provided the following is true:

a) With respect to the structural building member:

The maximum moments and shear forces, which when calculated on the same basis as the test load, shall not be greater than those tested.

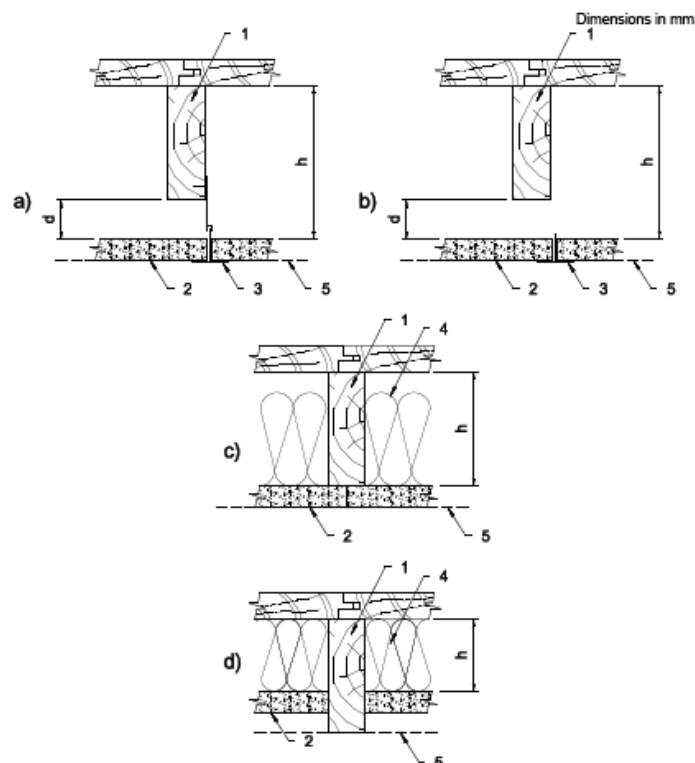
b) With respect to the ceiling system:

The size of panels of the ceiling lining may be increased by a maximum of 5 % but limited to a maximum of 50 mm. The length of the grid members can be increased accordingly.

The total area occupied by fixtures and fittings relative to the area of the ceiling lining is not increased and the maximum tested opening in the lining is not exceeded.

c) With respect to the cavity:

The height of the cavity 'h' and the minimum distance 'd' between the ceiling and the structural members (see Figure below) are equal to or greater than those tested.



KEY

a) suspended ceiling

b) self-supported ceiling

c) and d) direct fixed ceiling with insulation in cavity

1 supporting construction (joist)

2 ceiling lining

3 supporting frame

4 insulation

5 pressure reference line

d distance between ceiling and structural members

h height of cavity