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Title:

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

Date of Test:

01 August 2023

Issue 1

23 November 2023

WF Report No.

527459/R

Prepared for:

JCC Lighting Products Ltd

Lux Park,
Chrichester Business Park,
City Fields Way,
Tangmere,
Chichester,
West Sussex.

0249

Test Assembly

Summary of Tested Assembly

The timber floor had overall nominal dimensions of 4288 mm long by 2980 mm wide by 247 mm deep. The floor comprised 195 mm high C16 softwood solid timber joists at 450 mm centres. The unexposed face of the floor comprised nominally 22 mm thick tongue and groove chipboard. The floor assembly was protected by two layers of 15 mm thick 'Gyproc Fireline', through fixed to the timber framework with screws.

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

Test Ref.	Model Ref.	Cut Out Diameter.
1	JC1001	70 mm
2	JC10010	70 mm
3	JC1101	68 mm
4	JC1102	82 mm
5	JC1020	70 mm
6	JC010036	68 mm
7	JC010037	90 mm
8	JC010038	125 mm
9	JC010039	157 mm
10	JC010040	90 mm
11	JC010041	125 mm
12	JC010042	157 mm

The floor supported a uniformly distributed load of 1.13 kN/m^2. This load was calculated to represent the maximum design load for the timber floor construction.

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 the Standard, are calculated as:

Criteria	Value
L: Clear span - in mm	*4200*
d: Depth of structral section - in mm	*195*
Limiting deflection (L^2/400d) - in mm	**226.2**
Limiting rate of deflection (L^2/9000d) - in mm/min	**10.1**
Measured Deflection 1.5 x (L^2/400d) - in mm	**339.2**

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 94 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	94 minutes	
Gap gauge	94 minutes	No failure*
Cotton pad	94 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:**

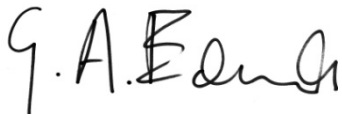
Specimen	94 minutes	Due to integrity failure

*Test Duration. Test was discontinued after a period of 94 minutes.

Date of Test 01 August 2023

Signatories

Responsible Officer
K. Brennan*
Technical Officer



Approved
G. Edmonds*
Senior Technical Officer

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

Report Issued: 23 November 2023

Revision History

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

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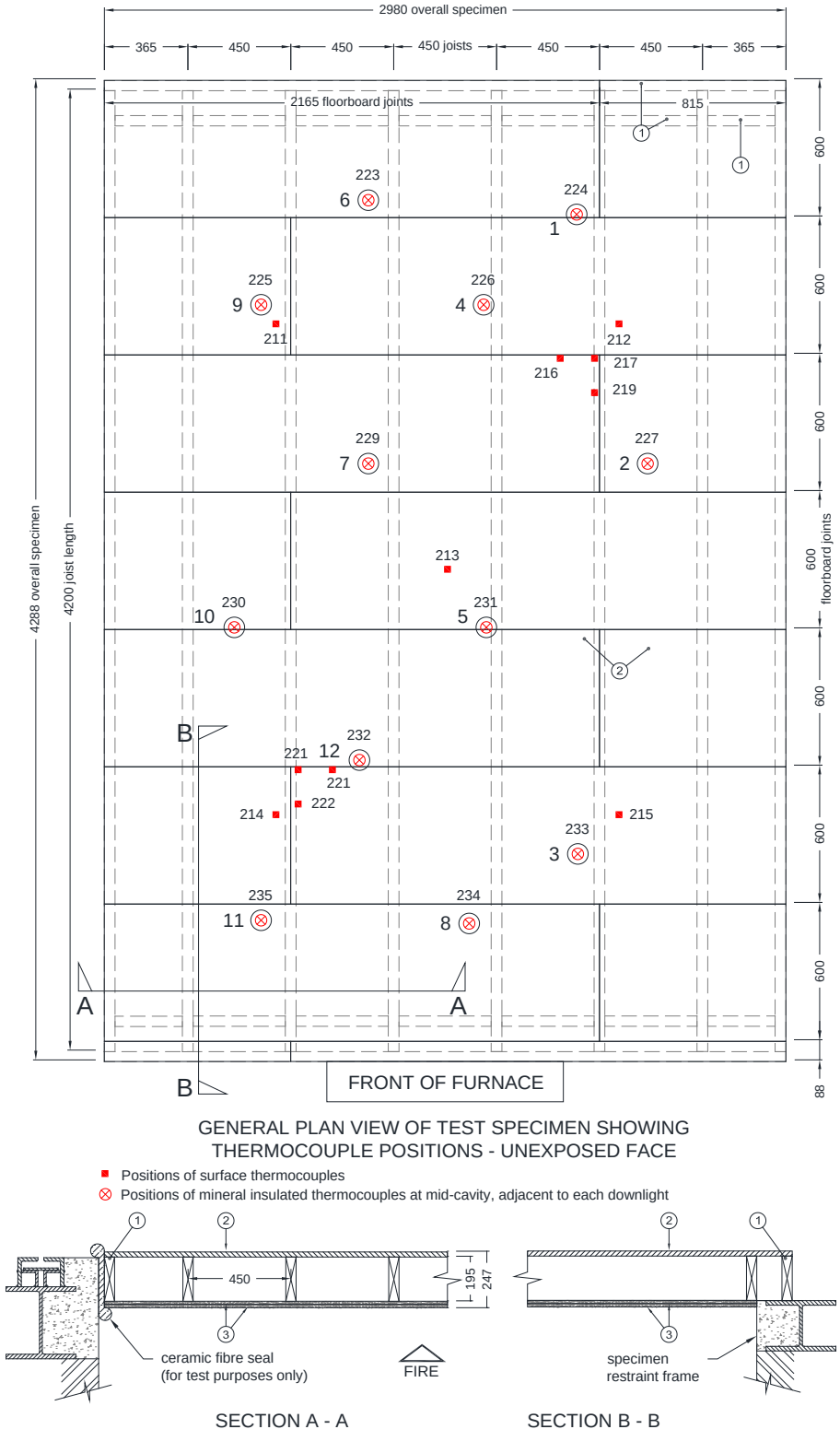
CONTENTS **PAGE NO.**

Test Conditions

Standard	BS EN 1365-2: 2014, 'Fire resistance tests for loadbearing elements – Part 2: Floors and Roofs' 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.
Sampling	**Warringtonfire** was not involved in the sampling or selection of the tested specimen or any of the components. The results obtained during the test only apply to the test samples as received and tested by **Warringtonfire.**
Installation	Representatives of **Warringtonfire** assembled the floor construction and installed the downlighters between the 27 and 31 July 2023.
Conditioning	The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of 7 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 19.5^{o}C to 27.5^{o}C and 44% to 76% respectively.
Instruction to Test	The test was conducted on the 01 August 2023 at the request of JCC Lighting Products Ltd, the test sponsor.
Ambient Temperature	The ambient air temperature in the vicinity of the test construction was 28ºC at the start of the test with a maximum variation of -2ºC during the test.
Furnace	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.
Thermocouples	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 thermocouples are shown in Figure 1.
Application of the load	The full test load was applied via dead load and hydraulic rams uniformly distributed over the test Specimen 90 minutes before the commencement of the test.
Loadbearing Capacity Criteria	A linear deflection transducer was provided at the approximate centre on the unexposed surface of the specimen to record its vertical deflection.
Furnace Pressure	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 specimen was 18 (± 5) Pa between 5 and 10 minutes and 18 (± 3) Pa thereafter.

Test Construction

Figure 1 – General plan of unexposed face showing thermocouple positions



GENERAL PLAN VIEW OF TEST SPECIMEN SHOWING THERMOCOUPLE POSITIONS - UNEXPOSED FACE

SECTION A - A

SECTION B - B

Do not scale. All dimensions are in mm

Figure 2 – General plan of exposed face

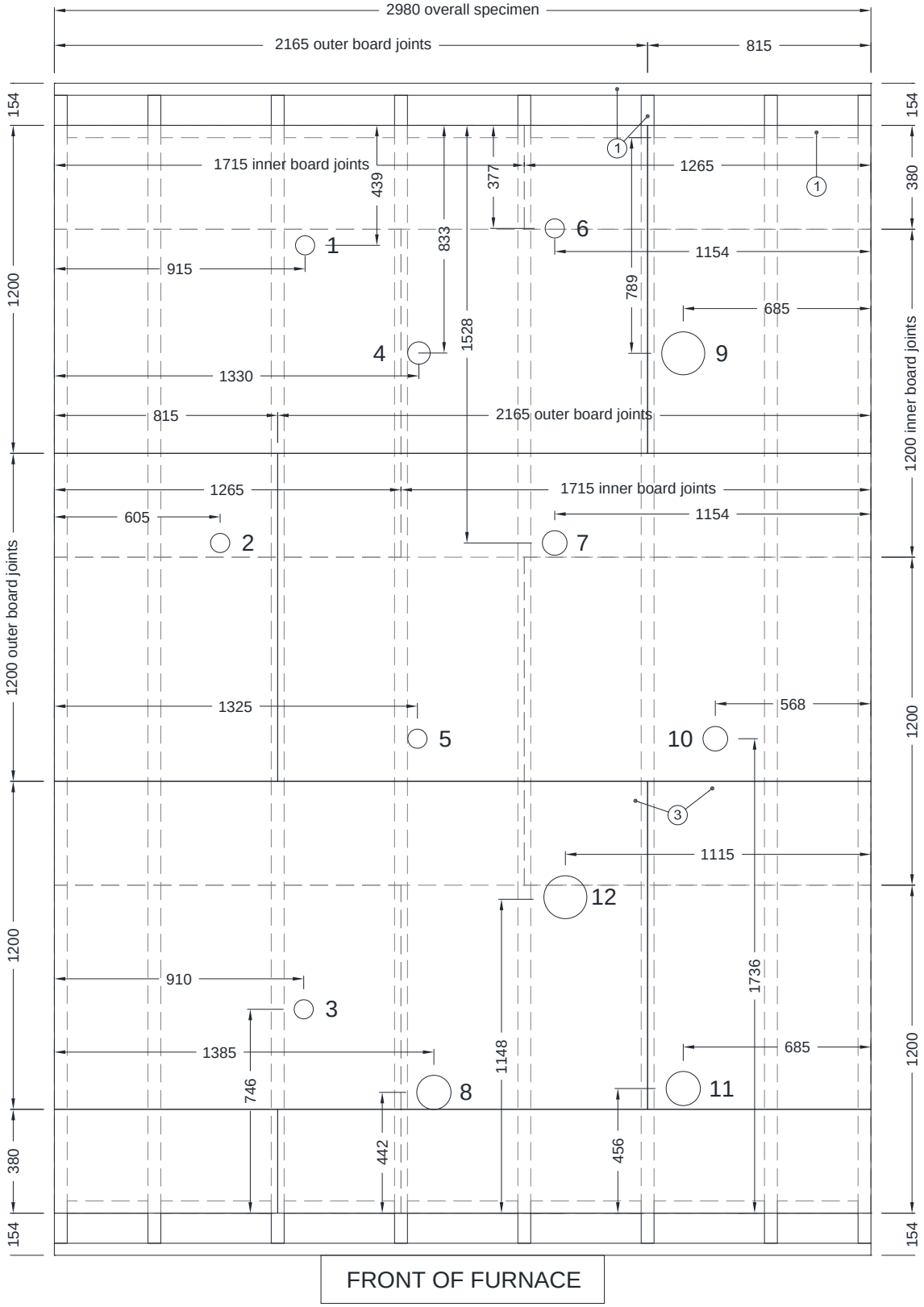


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Figure 3 – Downlight 1 JC1001

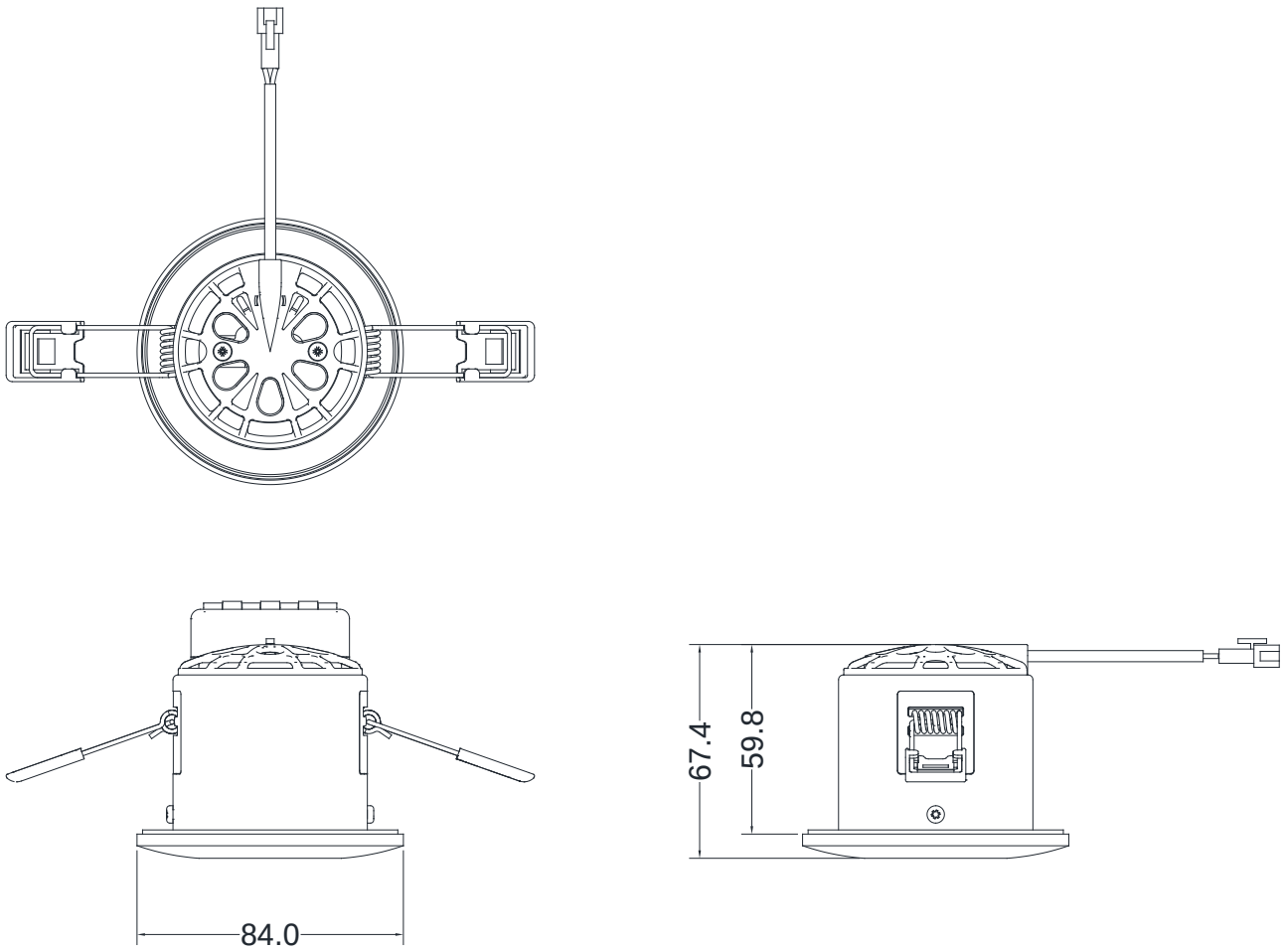

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Figure 4 – Downlight 2 JC10010

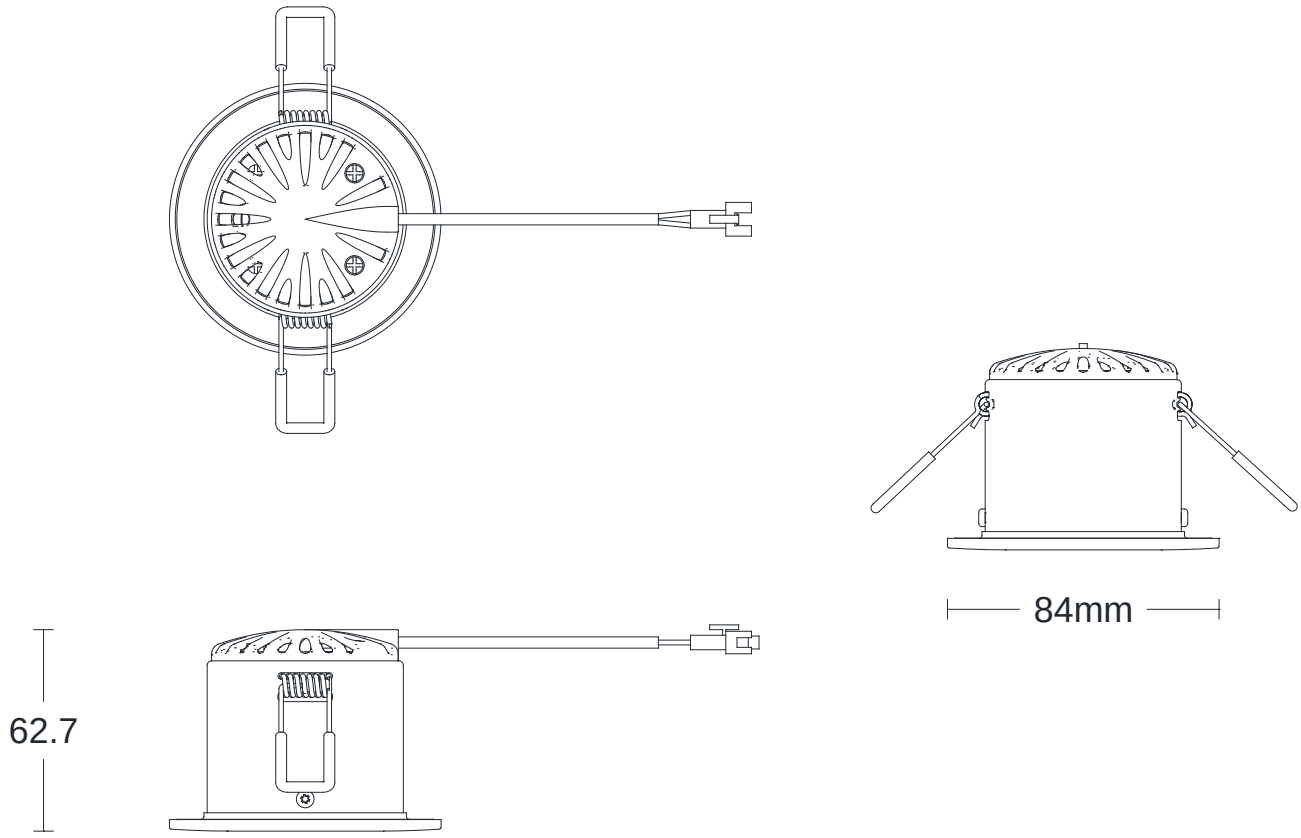

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Figure 5 – Downlight 3 JC1101

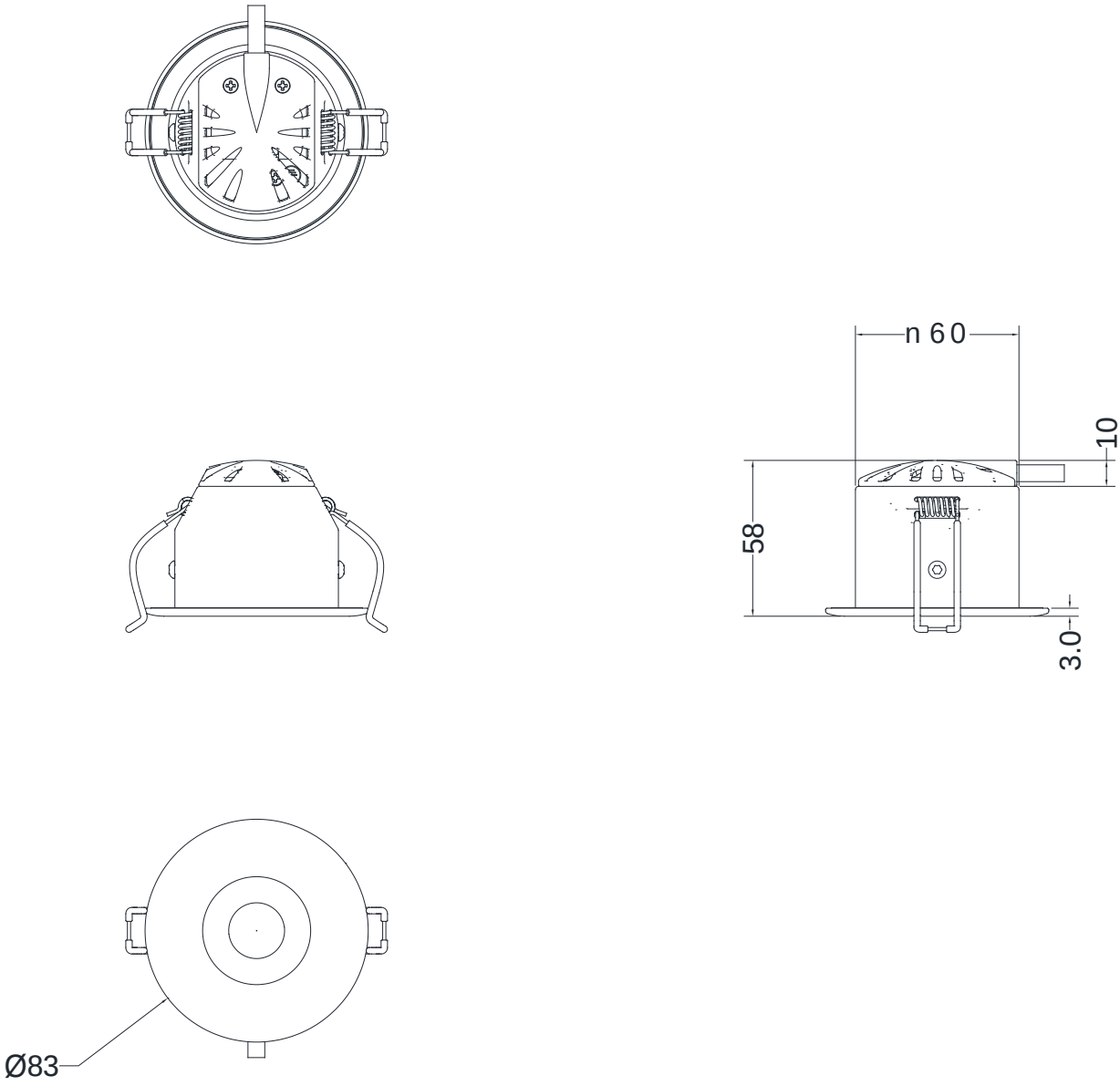

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Figure 6 – Downlight 4 JC1102

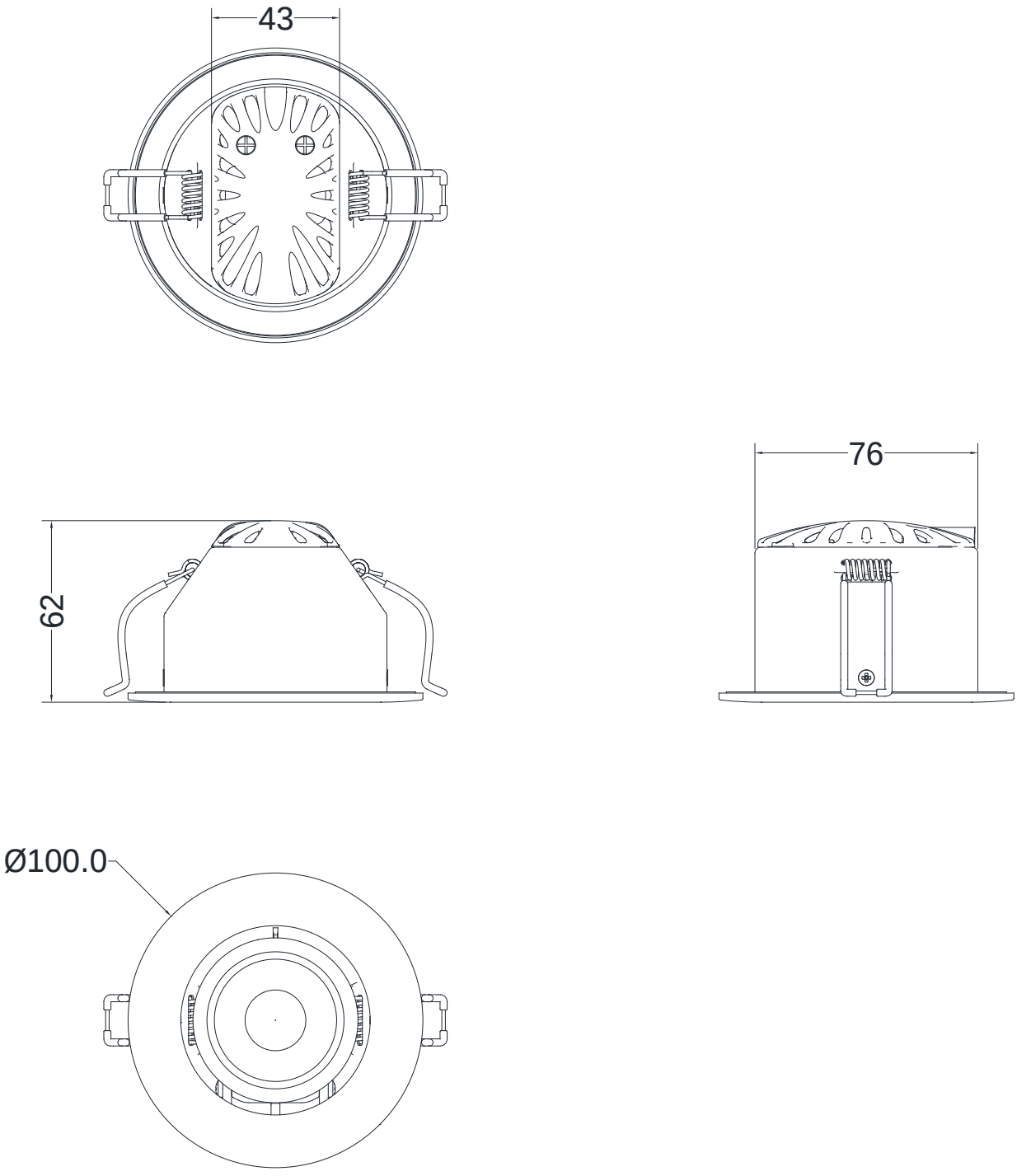

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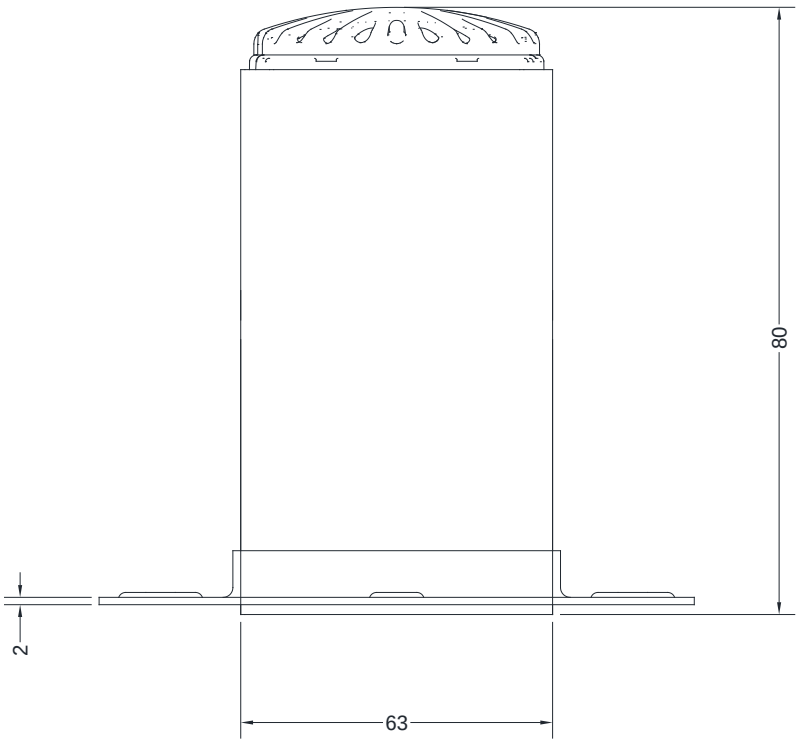
Figure 7 – Downlight 5 JC1020



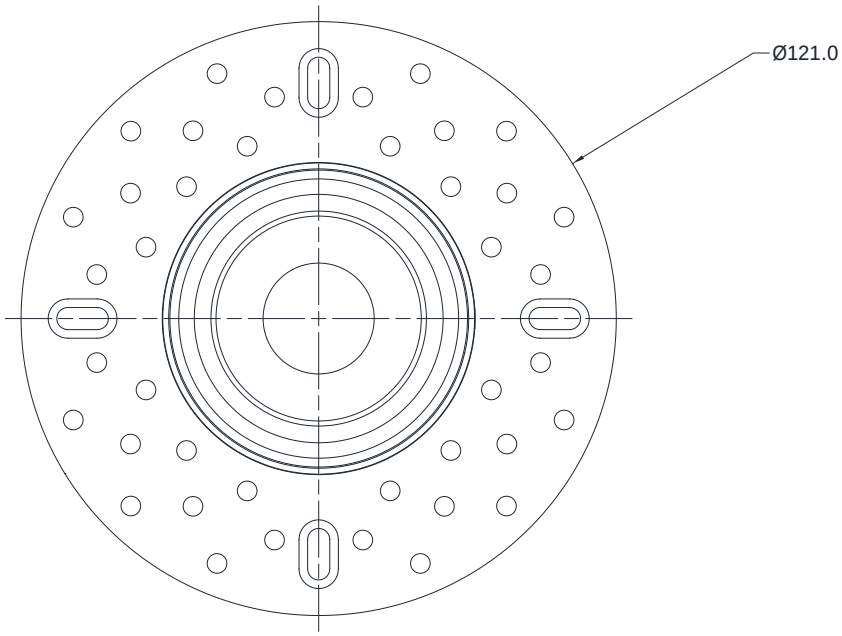


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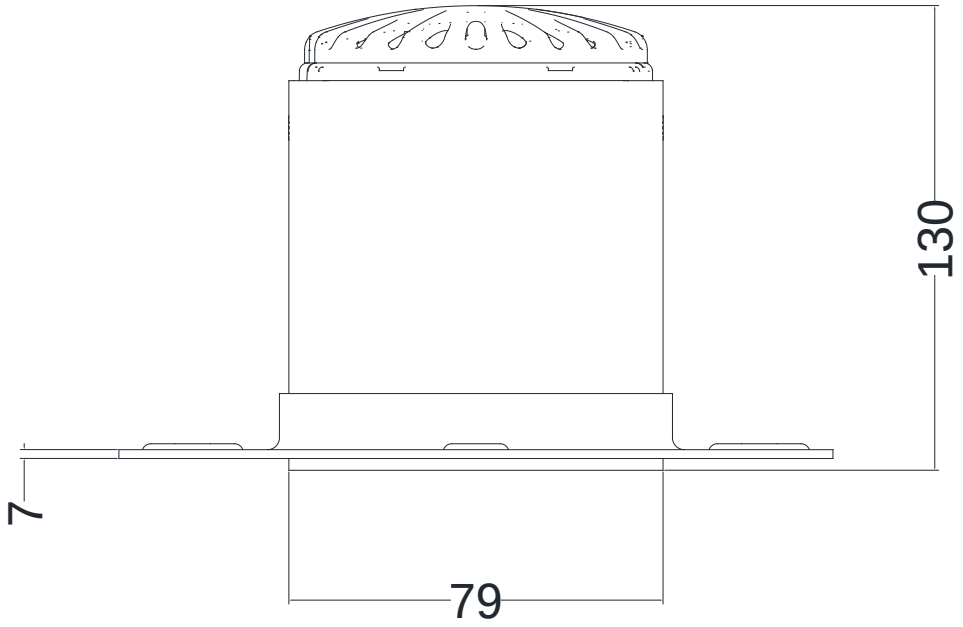
Figure 8 – Downlight 6 JC010036



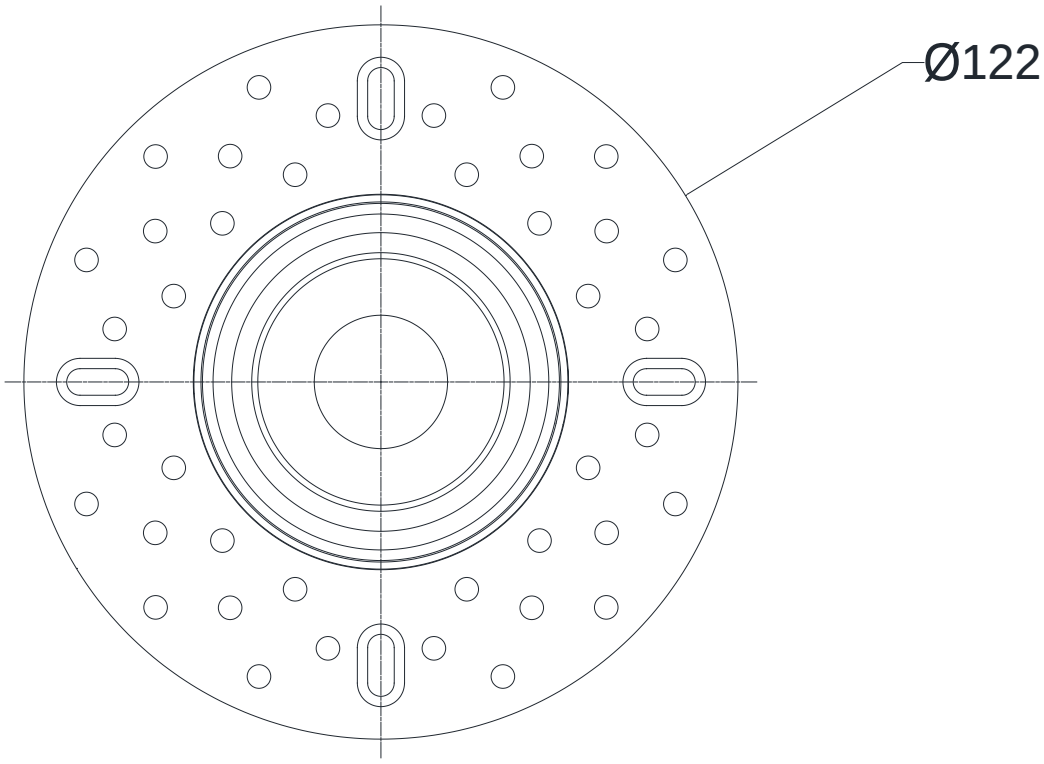


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Figure 9 – Downlight 7 JC010037

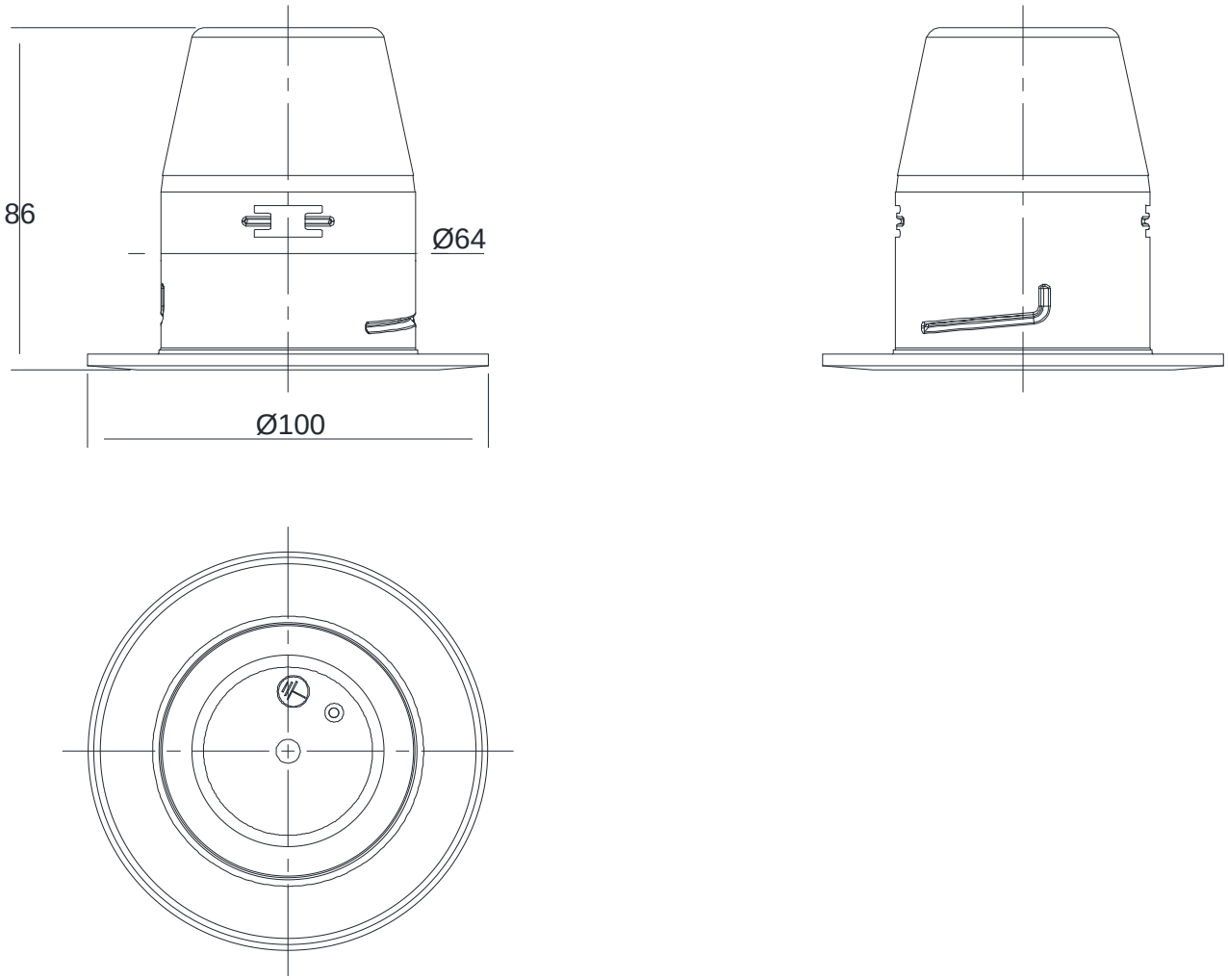

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Figure 10 – Downlight 8 JC010038

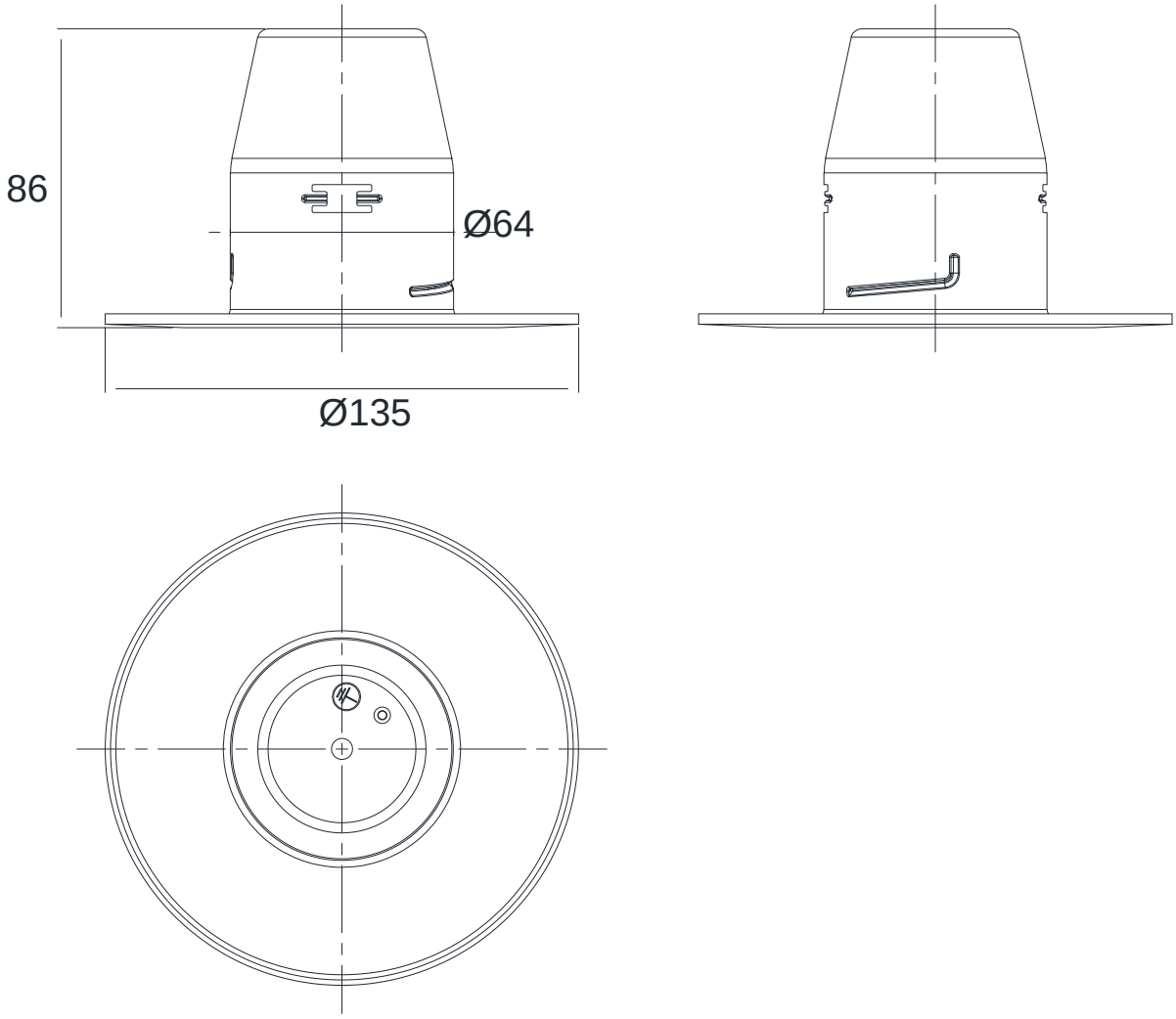

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Figure 11 – Downlight 9 JC010039

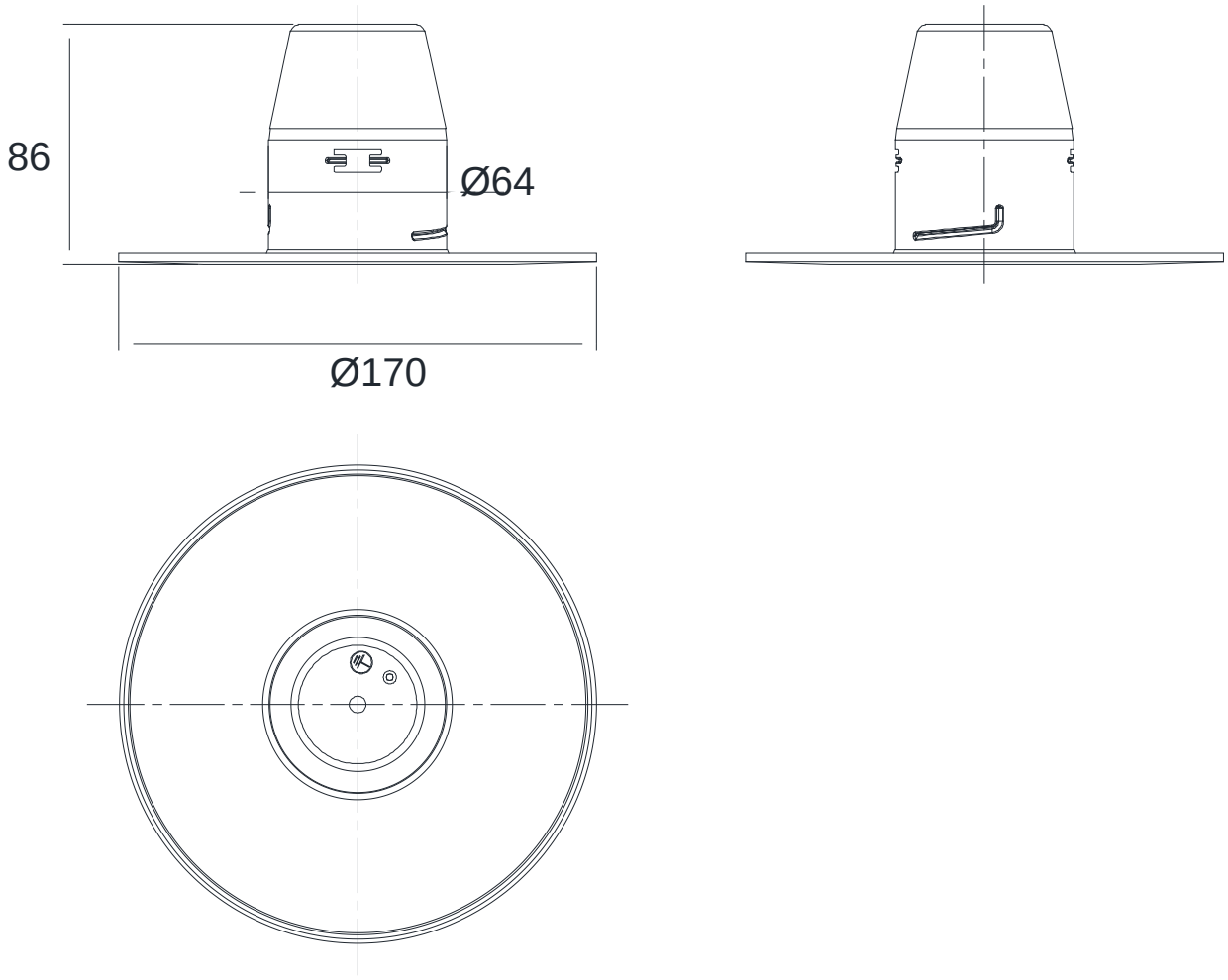

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Figure 12 – Downlight 10 JC010040

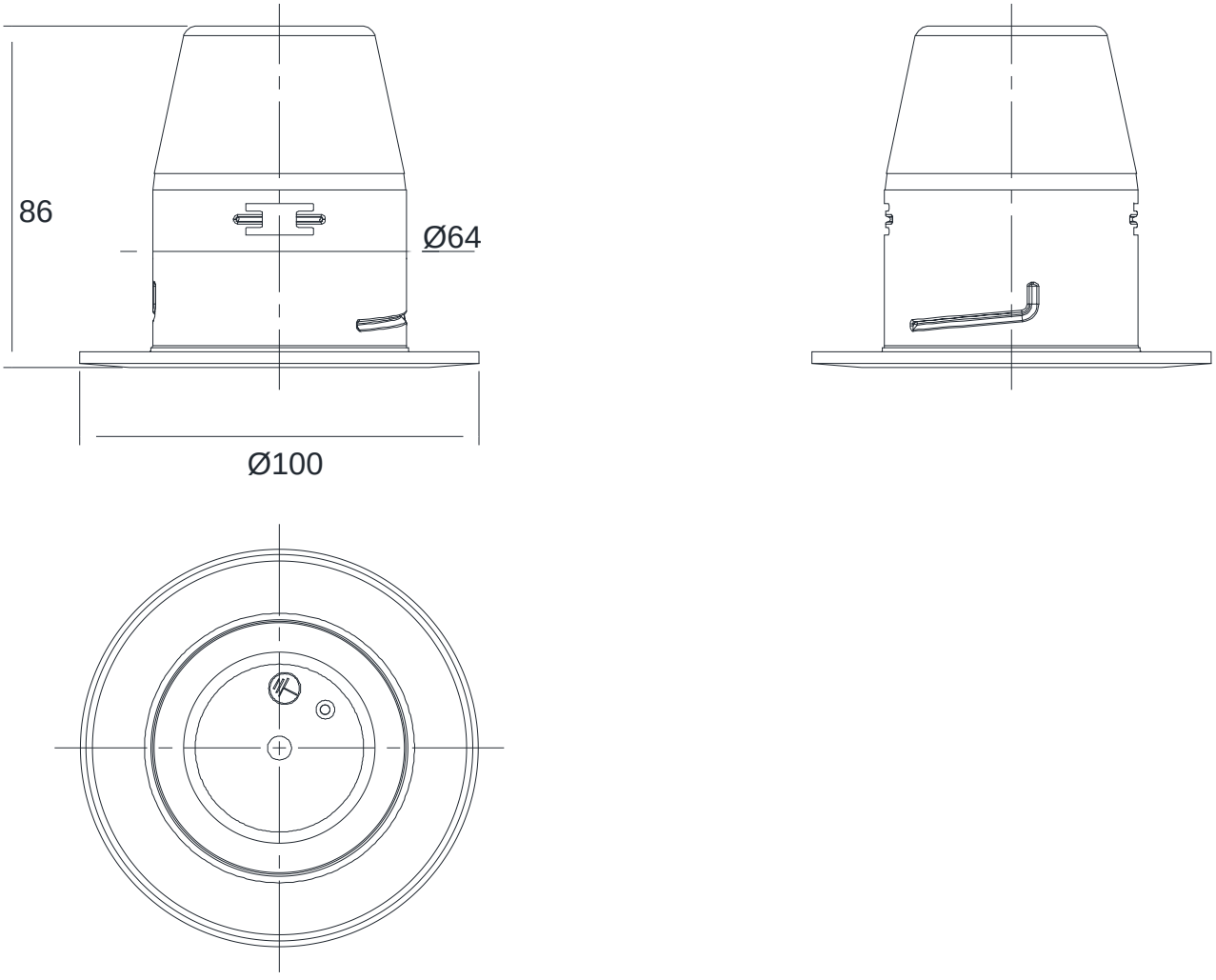

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Figure 13 – Downlight 11 JC010041

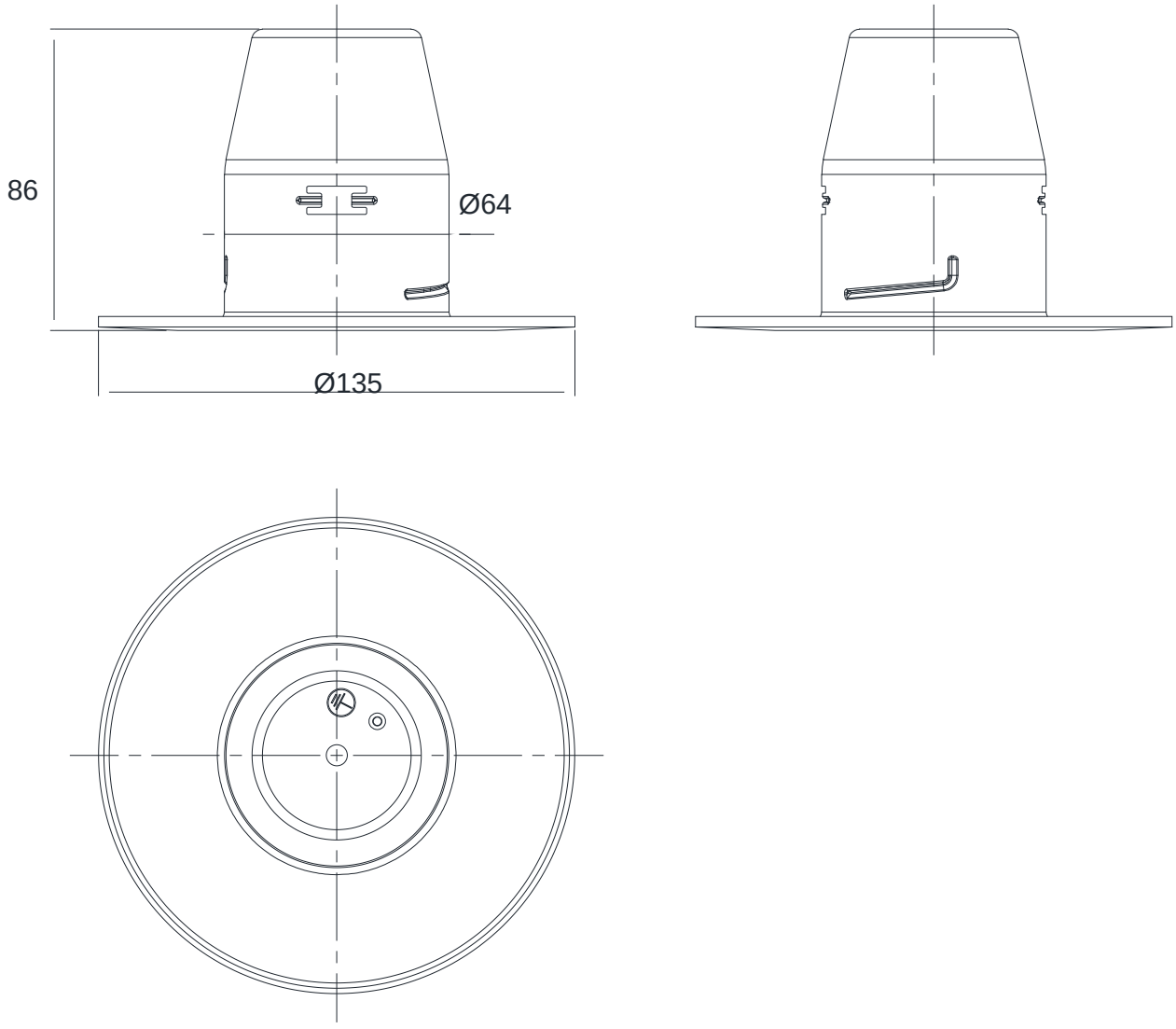

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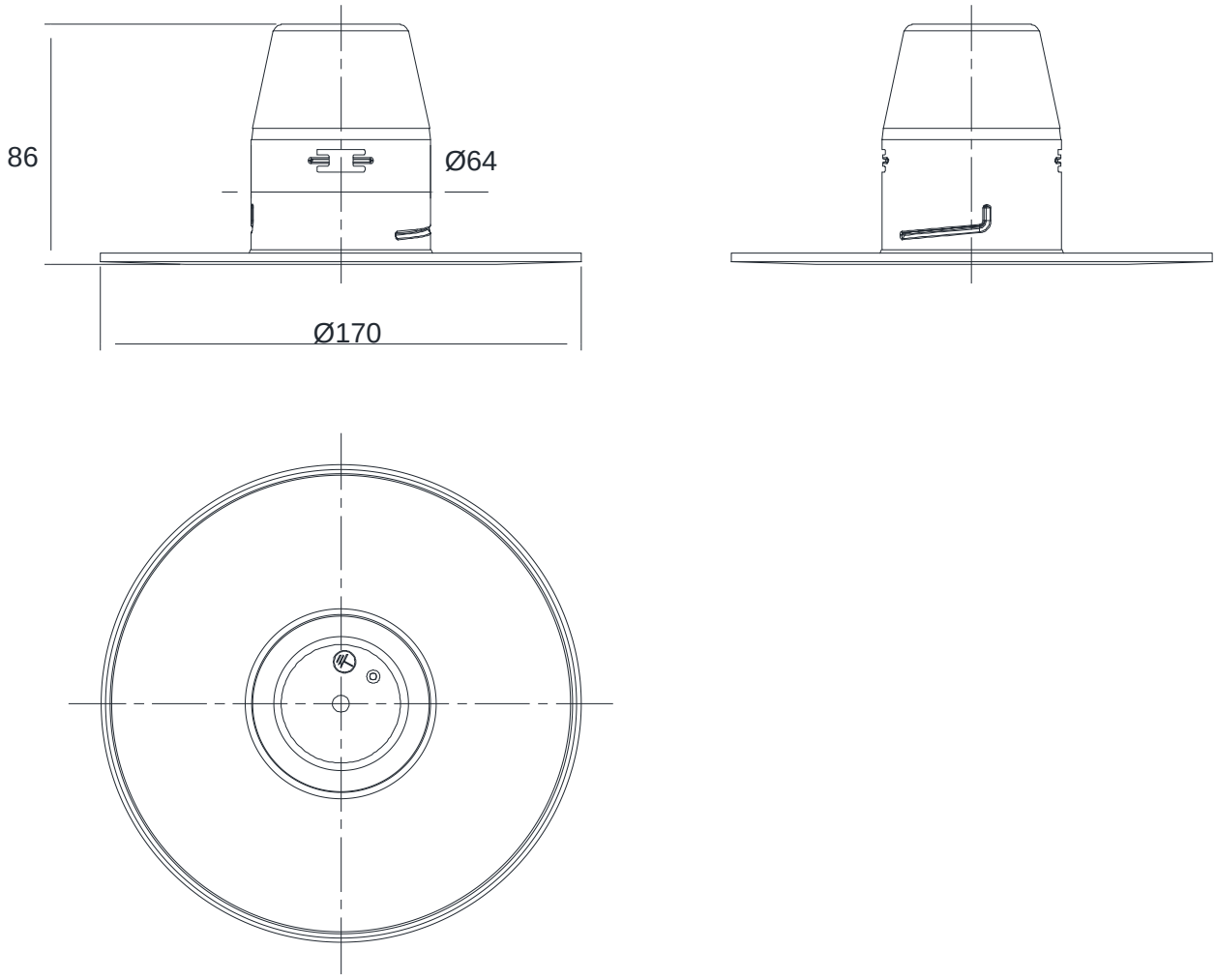
Figure 14 – Downlight 12 010042



Do not scale. All dimensions are in mm

Schedule of Components

(Refer to Figures 1 to 14)
(All values are nominal unless stated otherwise)
(All other details are as stated by the sponsor)

Item		Description
1. Timber framework		
Material	:	C16 softwood
Section size	:	195 mm deep x 44 mm wide
Density	:	420 kg/m³
Fixing method	:	End beams through fixed with six nails to each joist joint. Noggins fixed to joists with two nails per joint. Joists were spaced at 450mm nominal centres.
Fixings		
i. type	:	Ring shank nails
ii. size	:	100 mm long x 3.8 mm diameter
2. Floorboards		
Manufacturer	:	Norbord
Reference	:	Caberfloor P5
Material	:	Chipboard (tongue & groove)
Thickness	:	22 mm
Density	:	669 kg/m³ (stated)
Fixing method	:	Through fixed to timber framework with screws. Adhesive was applied to the top of joists and to tongue and groove joints
Fixings		
i. manufacturer	:	Reisser
ii. reference	:	Cutter High Performance Wood Screws
iii. type	:	Yellow tropicalised steel screws
iv. size	:	60 mm long x 4.0 mm diameter
v. centres	:	230 mm
Adhesive		
i. reference	:	Caberfix
ii. type	:	D4 grade adhesive
3. Ceiling boards		
Manufacturer	:	British Gypsum
Reference	:	Gyproc FireLine
Material	:	Gypsum plasterboard with glass fibre and additional additives
Thickness	:	30 mm (two layers of 15 mm)
Density	:	760 kg/m³ (stated)
Fixing method	:	Through fixed to internal framework with screws. Board joints were taped and filled
Fixings (inner layer)		
i. type	:	Black phosphate coated steel screws
ii. size	:	40 mm long x 3.5 mm diameter
iii. centres	:	150 mm (edge), 150 mm (field)
Fixings (outer layer)		
i. type	:	Black phosphate coated steel screws
ii. size	:	55 mm long x 3.5 mm diameter
iii. centres	:	150 mm (edge), 150 mm (field)

Item		Description
3. Ceiling boards (continued)		
Tape		
i. manufacturer	:	British Gypsum
ii. reference	:	Gyproc Joint Tape
Filler		
i. manufacturer	:	British Gypsum
ii. reference	:	Gyproc Ready Mix Joint Cement
4. Downlight 1		
Manufacturer	:	JCC Lighting
Reference	:	JC1001
Description	:	Fixed LED recessed downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip), polycarbonate (connection block)
Overall sizes	:	
i. height	:	48mm (can), 58 mm (overall)
ii. overall diameter	:	84mm
iii. cut-out diameter	:	70 mm
5. Downlight 2		
Manufacturer	:	JCC Lighting
Reference	:	JC10010
Description	:	Fixed LED Recessed Downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip), polycarbonate (connection block)
Overall sizes	:	
i. height	:	46 mm
ii. overall diameter	:	80 mm
iii. cut-out diameter	:	70 mm
6. Downlight 3		
Manufacturer	:	JCC Lighting
Reference	:	JC1101
Description	:	X50 Fire Rated Downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip), polycarbonate (connection block)
Overall sizes	:	
i. height	:	58 mm (can), 60 mm (overall)
ii. overall diameter	:	83 mm
iii. cut-out diameter	:	68 mm
7. Downlight 4		
Manufacturer	:	JCC Lighting
Reference	:	JC1102
Description	:	X50 Tilt Fire Rated Downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip), polycarbonate (connection block)
Overall sizes	:	
i. height	:	62 mm
ii. overall diameter	:	100 mm
iii. cut-out diameter	:	82 mm

Item		Description
8. Downlight 5		
Manufacturer	:	JCC Lighting
Reference	:	JC1020
Description	:	LED Recessed Plaster in Downlight
Material	:	Mild steel (can), aluminium (bezel) polycarbonate (connection block)
Overall sizes	:	
i. height	:	80mm
ii. overall diameter	:	121
iii. cut-out diameter	:	70 mm
9. Downlight 6		
Manufacturer	:	JCC Lighting
Reference	:	JC010036
Description	:	GU10 Recessed Plaster in downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip), polycarbonate (connection block)
Overall sizes	:	
i. height	:	130mm
ii. overall diameter	:	122 mm
iii. cut-out diameter	:	68 mm
10. Downlight 7		
Manufacturer	:	JCC Lighting
Reference	:	JC010037
Description	:	GU10 Recessed 100mm Converter Downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip), polycarbonate (connection block)
Overall sizes	:	
i. height	:	86 mm
ii. overall diameter	:	100 mm
iii. cut-out diameter	:	90 mm
11. Downlight 8		
Manufacturer	:	JCC Lighting
Reference	:	JC010038
Description	:	GU10 Recessed 135mm Converter Downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip) polycarbonate (connection block)
Overall sizes	:	
i. height	:	86 mm
ii. overall diameter	:	135 mm
iii. cut-out diameter	:	125 mm
12. Downlight 9		
Manufacturer	:	JCC Lighting
Reference	:	JC010039
Description	:	GU10 Recessed 170mm Converter Downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip), polycarbonate connection block)
Overall sizes	:	
i. height	:	86 mm
ii. overall diameter	:	170 mm
iii. cut-out diameter	:	157 mm

Item		Description
13. Downlight 10		
Manufacturer	:	JCC Lighting
Reference	:	JC010040
Description	:	GU10 Recessed 100mm Converter Downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip), polycarbonate (connection block)
Overall sizes	:	
i. height	:	86 mm
ii. overall diameter	:	100 mm
iii. cut-out diameter	:	90 mm
14. Downlight 11		
Manufacturer	:	JCC Lighting
Reference	:	JC010041
Description	:	GU10 Recessed 135mm Converter Downlight
Material	:	Mild steel (can), aluminium (bezel), steel (spring clip), polycarbonate (connection block)
Overall sizes	:	
i. height	:	86 mm
ii. overall diameter	:	135 mm
iii. cut-out diameter	:	125 mm
15. Downlight 12		
Manufacturer	:	JCC Lighting
Reference	:	JC010042
Description	:	GU10 Recessed 170mm Converter Downlight
Material	:	Steel (can), aluminium (bezel), steel (spring clip), polycarbonate (connection block)
Overall sizes	:	
i. height	:	86 mm
ii. overall diameter	:	170 mm
iii. cut-out diameter	:	157 mm

Test Observations

Time		All observations are from the exposed face unless noted otherwise.
- 90	00	**Load applied and maintained.**
00	00	**The test commences.**
14	00	When viewed from the unexposed face slight steam/smoke release around the perimeter of the floor.
15	00	Paper layer of boards burning away. Jointing compound detached and downlights 2 & 4 dropped from ceiling.
22	00	Multiple downlights now detached from ceiling.
32	00	Joints in first layer of board have opened slightly.
46	00	Long edges of first layer of board starting to open slightly.
60	00	When viewed from the unexposed face, specimen maintaining all performance criteria.
75	00	Gaps in long edges of board continue to open.
85	00	Section of first layer of board detached and heavy flaming through apertures.
86	00	When viewed form the unexposed face, dark discolouration of joint in floorboards where smoke release also occurs.
90	00	When viewed from the unexposed face, specimen maintaining all performance criteria.
93	00	Second layer of boards detached, and furnace engulfed in flames.
94	00	**Test discontinued owing to sustained flaming through the floorboards.**

Test Photographs

The unexposed face of the floor assembly prior to test

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

The unexposed face of the floor assembly after 60 minutes of testing

The unexposed face of the floor assembly after 90 minutes of testing

The unexposed face of the floor assembly after 94 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	35
3	502	496
6	603	609
9	663	655
12	706	687
15	739	732
18	766	762
21	789	784
24	809	804
27	826	824
30	842	847
33	856	860
36	869	876
39	881	883
42	892	893
45	902	900
48	912	912
51	921	917
54	930	923
57	938	933
60	945	946
63	953	951
66	960	959
69	966	966
72	973	972
75	979	982
78	985	991
81	990	993
84	996	1002
87	1001	1003
90	1006	1007
93	1011	1002
94	1012	998

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

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	29	29	29	30	29	29
3	29	29	29	30	29	29
6	29	29	29	30	30	29
9	29	29	29	30	30	29
12	30	30	29	30	30	30
15	30	30	30	30	30	30
18	32	31	31	31	31	31
21	33	33	33	32	32	33
24	35	34	34	34	34	34
27	37	36	36	36	35	36
30	40	38	38	37	37	38
33	42	40	40	39	38	40
36	45	41	42	41	40	42
39	47	43	43	43	41	43
42	49	44	45	45	43	45
45	51	46	46	46	44	47
48	53	47	48	48	46	48
51	56	49	49	49	47	50
54	57	50	50	51	49	51
57	59	51	52	52	50	53
60	61	53	53	53	52	54
63	62	54	54	54	53	55
66	63	54	55	55	54	56
69	64	55	56	55	55	57
72	65	56	57	56	56	58
75	67	57	58	57	56	59
78	68	58	62	59	58	61
81	71	60	66	62	60	64
84	74	62	71	69	64	68
87	77	65	75	82	68	73
90	80	69	79	88	73	78
93	83	73	82	88	77	81
94	84	75	83	88	85	83

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

Time Mins	T/C Number 216 Deg. C	T/C Number 217 Deg. C	T/C Number 219 Deg. C	T/C Number 220 Deg. C	T/C Number 221 Deg. C	T/C Number 222 Deg. C
0	29	29	29	29	29	25
3	29	29	29	29	29	25
6	29	29	29	29	29	25
9	29	29	30	29	30	26
12	30	29	30	30	30	26
15	31	30	30	30	31	27
18	32	30	31	32	32	28
21	34	31	32	33	33	29
24	37	33	33	36	35	31
27	39	35	35	38	37	33
30	41	37	37	40	39	35
33	43	38	38	43	41	37
36	45	40	40	45	43	38
39	47	42	41	48	45	40
42	48	44	43	51	46	42
45	50	45	44	54	48	44
48	51	47	46	57	49	46
51	53	49	48	59	51	48
54	55	51	49	61	53	50
57	56	53	51	63	54	52
60	58	54	52	65	56	55
63	59	56	53	66	58	57
66	59	56	53	68	60	60
69	61	57	55	69	62	63
72	63	59	56	70	66	68
75	64	59	57	72	70	76
78	66	60	57	74	75	84
81	67	61	58	76	81	87
84	69	62	59	82	85	88
87	71	64	61	86	87	89
90	72	66	63	88	86	89
93	75	69	66	89	87	90
94	75	70	67	89	87	89

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

Time Mins	T/C Number 223 Deg. C	T/C Number 224 Deg. C	T/C Number 225 Deg. C	T/C Number 226 Deg. C	T/C Number 227 Deg. C	T/C Number 229 Deg. C
0	29	29	30	30	30	32
3	34	30	41	36	37	47
6	44	38	60	61	45	48
9	55	52	68	72	65	55
12	70	59	75	84	75	75
15	90	71	93	105	83	88
18	108	77	124	102	105	96
21	109	82	138	100	112	100
24	103	86	138	112	98	105
27	91	89	145	117	93	104
30	129	94	147	118	90	143
33	116	100	161	119	96	146
36	123	102	176	131	100	155
39	120	105	166	123	105	157
42	127	108	167	136	107	168
45	132	107	174	139	109	170
48	140	108	183	142	114	167
51	140	112	179	145	115	170
54	144	115	182	145	114	173
57	147	120	167	153	115	180
60	153	125	172	149	116	185
63	157	131	179	152	117	200
66	159	131	191	156	128	215
69	169	144	179	161	137	233
72	175	157	196	173	167	252
75	190	173	210	192	188	267
78	207	188	230	212	202	285
81	210	201	261	221	221	304
84	221	213	303	248	233	327
87	237	224	322	268	247	343
90	245	235	340	287	251	376
93	252	249	349	392	321	383
94	250	252	358	330	317	373

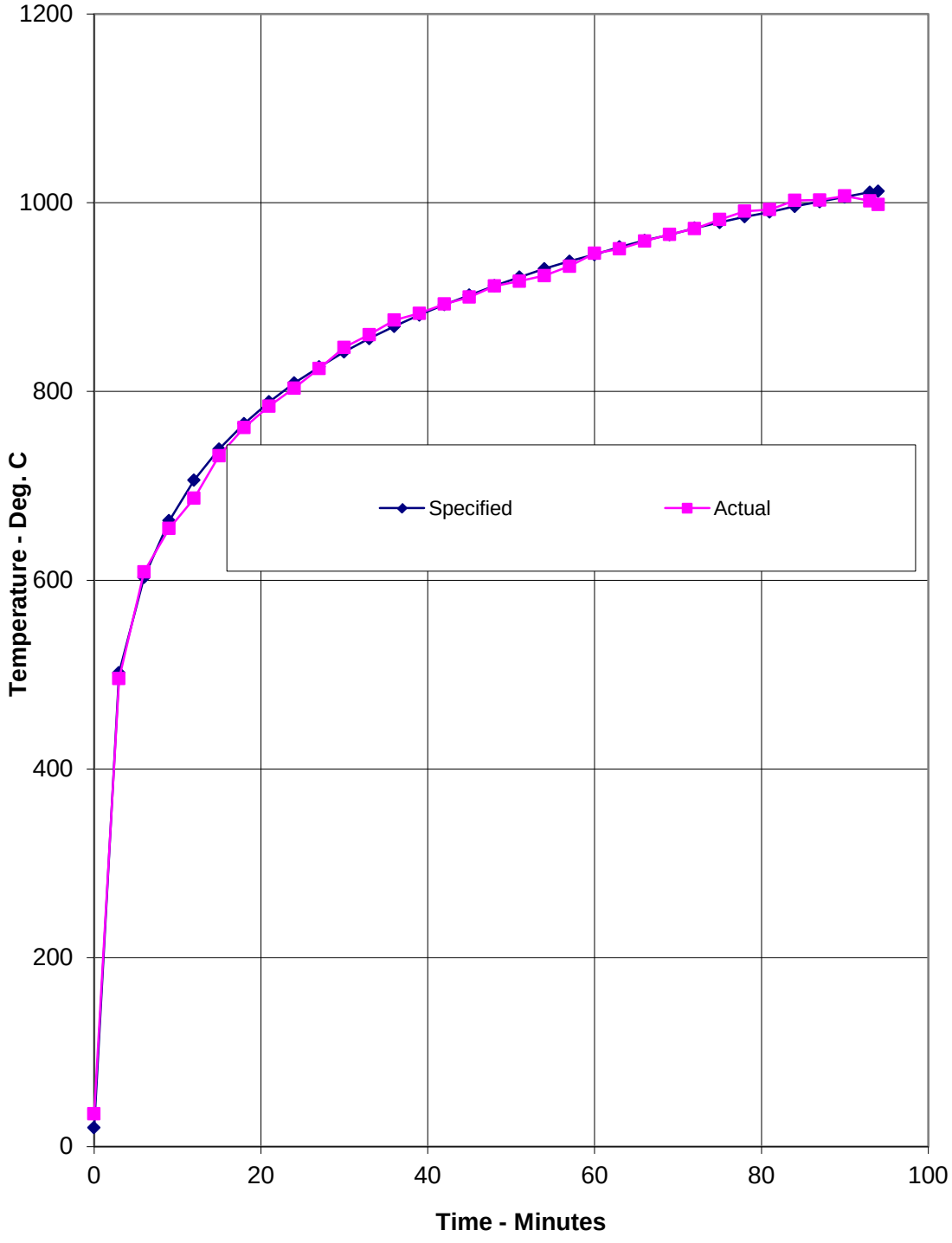
Individual Temperatures Recorded At Mid-Height Of The Cavity Coincidental With The Light Fittings (Continued)

Time Mins	T/C Number 230 Deg. C	T/C Number 231 Deg. C	T/C Number 232 Deg. C	T/C Number 233 Deg. C	T/C Number 234 Deg. C	T/C Number 235 Deg. C
0	32	32	33	33	33	33
3	35	34	58	34	36	39
6	45	40	60	39	43	43
9	57	79	78	55	64	64
12	75	82	89	66	69	85
15	83	111	112	78	80	92
18	108	126	117	86	84	89
21	142	130	134	90	87	96
24	147	118	139	95	92	111
27	147	136	172	91	95	130
30	157	177	216	97	100	134
33	153	176	223	101	106	162
36	157	152	244	103	110	173
39	171	159	277	107	115	170
42	170	167	304	108	117	170
45	166	164	288	110	119	177
48	163	167	309	111	121	167
51	163	155	325	112	122	172
54	149	157	293	113	125	167
57	155	165	331	115	128	173
60	175	162	348	119	132	167
63	164	154	379	130	147	171
66	173	144	410	146	175	168
69	192	167	449	162	197	173
72	216	187	467	181	219	188
75	239	218	493	200	236	203
78	247	229	508	215	251	220
81	234	239	553	230	266	342
84	270	246	578	243	287	429
87	287	261	585	256	295	443
90	311	279	610	291	378	461
93	341	322	740	659	652	462
94	354	446	766	759	764	444

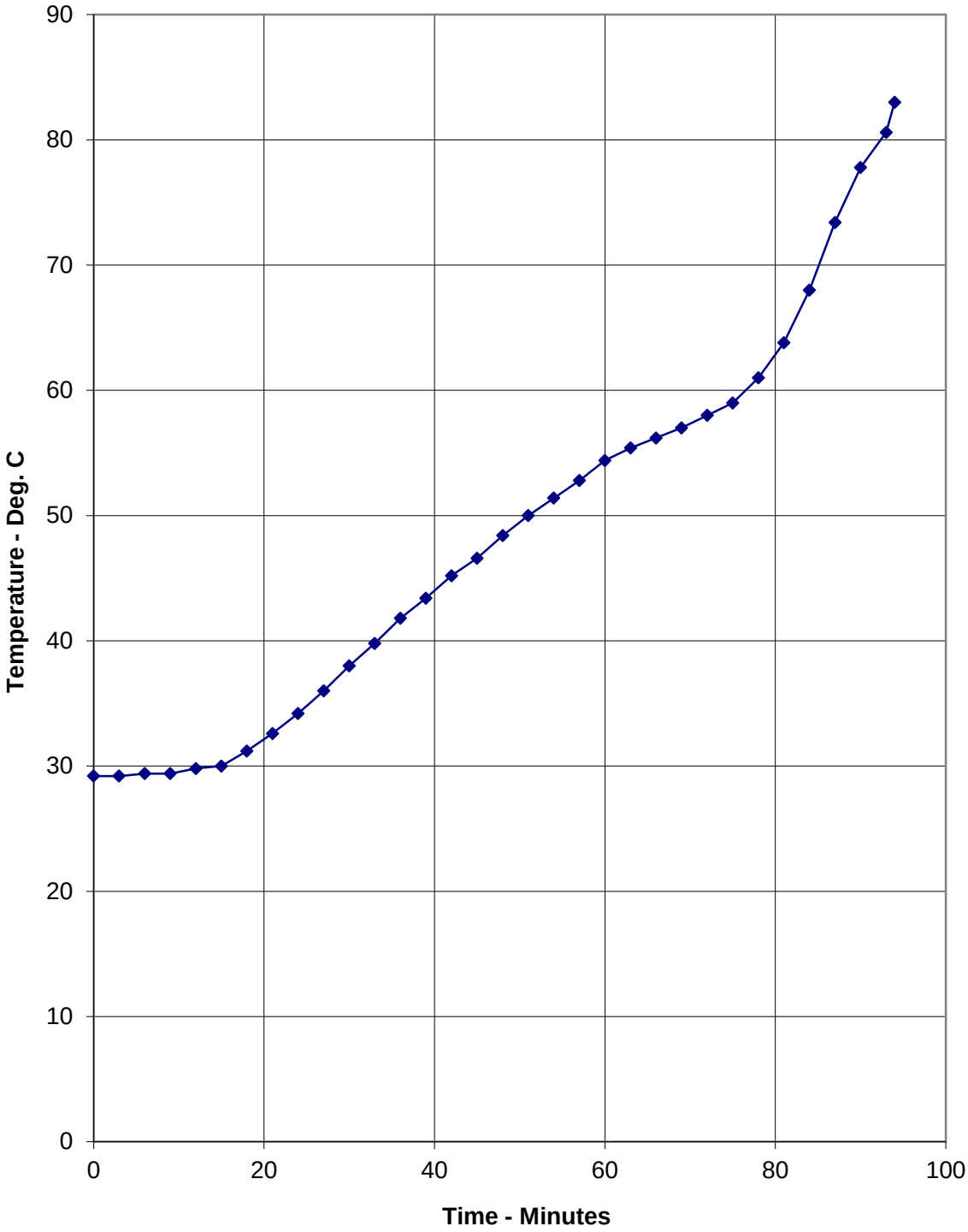
Central Vertical Deflection Of The Specimen

Time Mins	Central Vertical Deflection mm	Rate Of Deflection mm/min
0	0.0	0.0
3	0.0	0.2
6	0.6	0.2
9	0.9	0.1
12	1.1	0.1
15	1.5	0.2
18	2.0	0.1
21	2.6	0.3
24	3.4	0.4
27	4.4	0.4
30	5.3	0.3
33	6.1	0.4
36	7.0	0.3
39	8.1	0.4
42	8.9	0.4
45	9.7	0.2
48	10.5	0.3
51	10.9	0.2
54	11.5	0.2
57	12.1	0.1
60	12.6	0.1
63	13.1	0.1
66	13.5	0.2
69	13.8	0.0
72	14.4	0.2
75	15.0	0.2
78	15.8	0.4
81	17.2	0.5
84	18.7	0.6
87	20.9	0.8
90	23.3	0.5
93	26.5	0.9
94	28.4	2.0

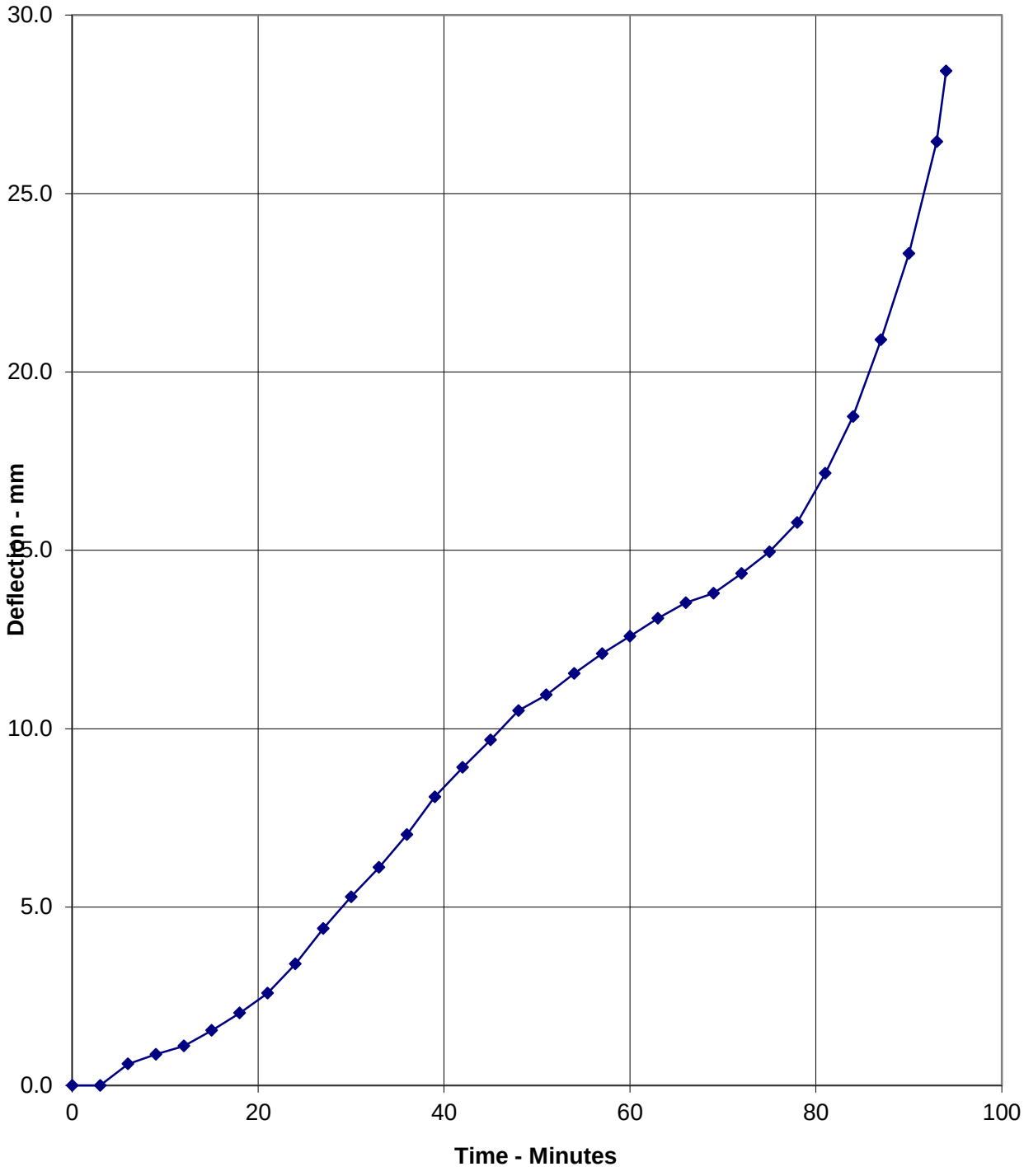
Graph Showing Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In The Standard



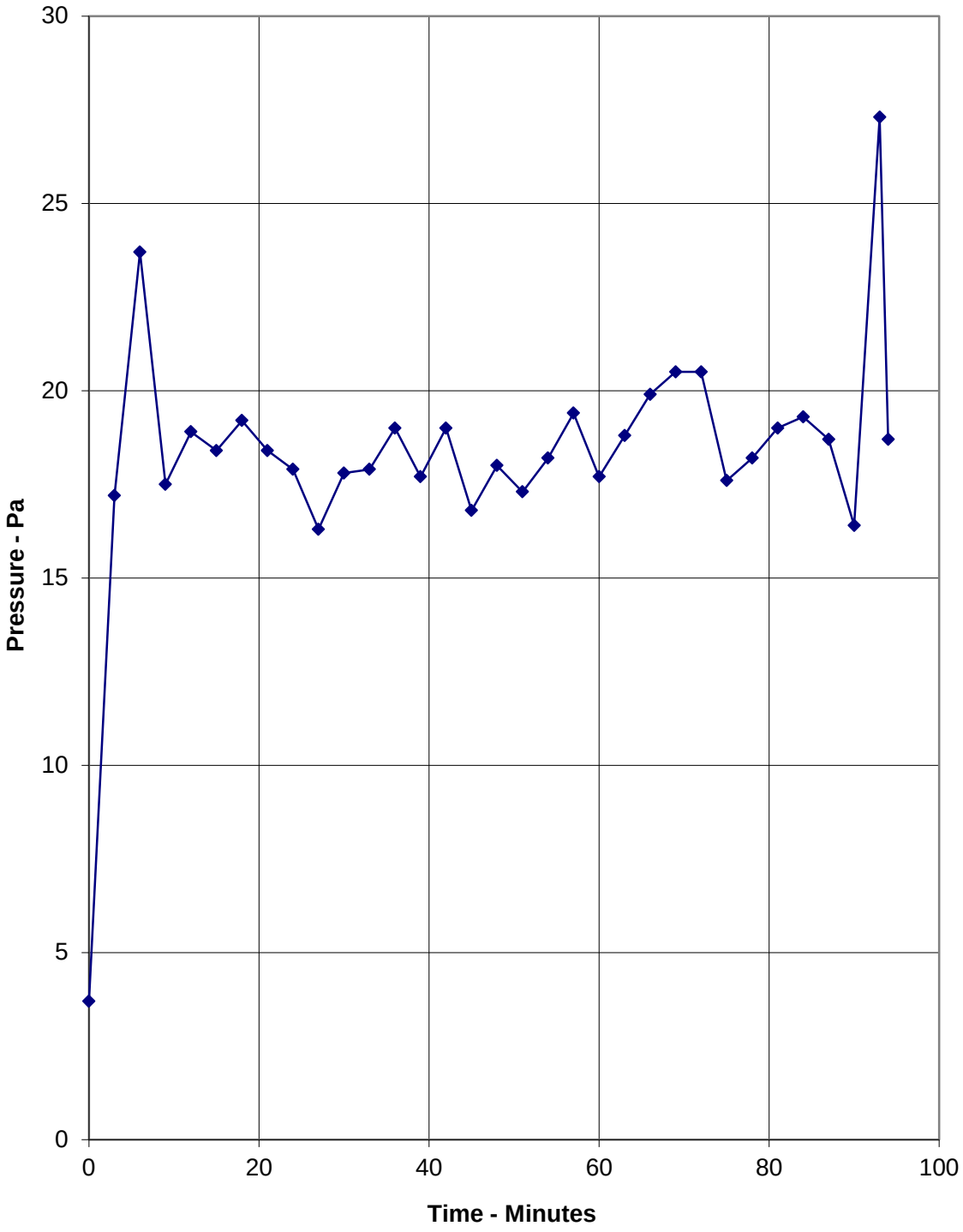
Graph Showing Mean Temperature Recorded On The Unexposed Surface Of The Specimen



Graph Showing The Recorded Vertical Deflection Of The Specimen



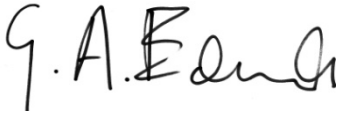
Graph Showing Recorded Furnace Pressure 100 mm Below The Underside Of The Specimen



Load Calculation

Physical parameters of timber joists		
Depth :	195	mm
Thickness :	44	mm
Centres (M) :	450	mm
Span (L) :	4200	mm
Ceiling length	3970	mm
Floor boards length	4495	mm
Timber grade :	c16	
Parameters -BS 5268 - Part 2: 2002		
Basic dry stress in bending:	5.3	N/mm2
Modification factor for loading:	1.1	(Section 2.9 (a))
Therefore working stress (F):	5.83	N/mm2
Nominal density:	535	kg/m3
Total loading required per joist		
moment of inertia (I) bd3/12:	27187875	mm4
Distance from neutral axis to base of joist (y):	97.5	mm
Maximum bending stress w (FI/y):	1625695.5	N/mm2
w = load per unit length		
maximum bending stress = w x L2 /8		
therefore w= maximum bending stress x 8 / L2:	0.7372769	N/mm
	737.27687	N/m
Therefor total loading (w):	3096.5629	N
Converted to kg (/ 9.80665)	315.76153	kg
Dead weight		
Density of joist:	498.842	kg/m3
Density of floor boarding	666.364	kg/m3
Density of ceiling (layer 1)	928	kg/m3
Density of ceiling (layer 2)	928	kg/m3
Effective width of floor supported per joist (m):	0.45	m
weight of joist	17.97627	kg
weight of floorboard	29.653531	kg
weight of ceiling (layer 1)	24.86808	kg
weight of ceiling (layer 2)	24.86808	kg
weight of ceiling (layer 3)	0	kg
Total ceiling weight:	49.73616	
Totak dead weight per joist	97.365961	kg
Imposed Load		
total load per joist - dead weight per joist:	218.39557	kg
Convert to kN ((x 9.80665)/1000)	2.141729	kN
Assusming even distribution of loading		
Maximim imposded load per meter square:	**1.1331899**	**kN/m2**
converted to kg (x101.9716005)	**116**	**kg/m2**

Calculation made by
K. Brennan*
Technical Officer



Calculation checked by
G. Edmonds*
Senior Technical Officer

*For and on behalf of **Warringtonfire**

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.

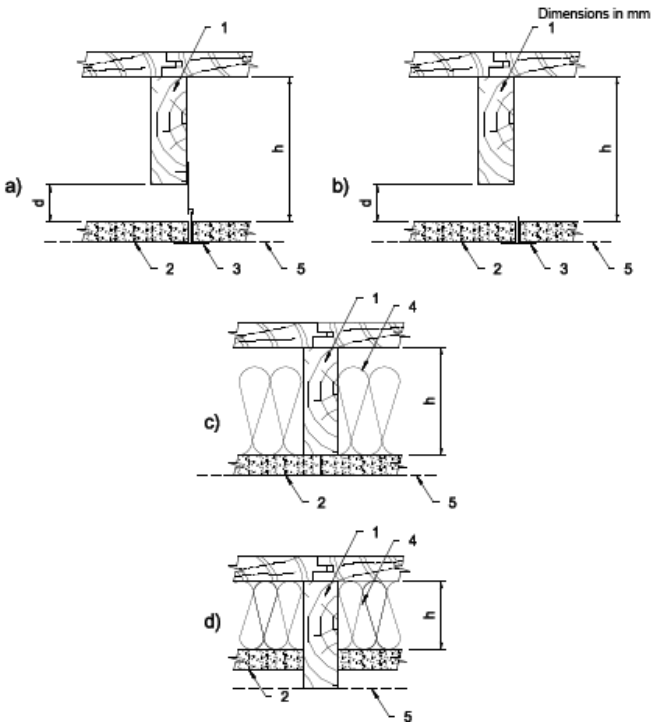
b) With respect to the ceiling system:

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