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**Title:**

Fire Resistance Test in  
Accordance with  
AS 1530.4: 2014, on a  
Loadbearing Composite Floor  
Assembly

**Report No:**

381193



**Prepared for:**

**ComFlor Building Systems**  
Steel & Tube Stainless (ComFlor)  
30, Business Parade North  
Highbrook  
Manukau  
Auckland  
New Zealand

**Date:**

14<sup>th</sup> May 2018

**Notified Body No:**

0833



# Summary

<b>Objective</b>	To determine the fire resistance of a specimen of a loadbearing composite concrete floor, when tested in accordance with AS 1530.4: 2014.
<b>Test Sponsor</b>	<b>ComFlor Building Systems</b>
<b>Address</b>	Steel & Tube Stainless (ComFlor). 30, Business Parade North Highbrook Manukau Auckland New Zealand
<b>Summary of Tested Specimen</b>	The specimen floor had an overall nominal size of 4820 mm long by 3000 mm wide (supporting beam widths 3300 mm) by 120 mm deep. Briefly, the floor comprised profiled, galvanised steel decking referenced 'ComFlor SR Steel decking' topped with Grade C30/37 concrete. The steel decking material was nominally 0.75 mm thick. The deck was supported on three steel beams and was attached to the beams with through deck welded shear studs. A mild steel mesh referenced 'A142', was included in the deck construction. The steel beams were arranged such that the tested span of the assembly was 3250 mm. The decking extended beyond the tested span on to a third steel beam to represent the continuation of the floor slab. The continuation section of the floor spanned 1000 mm onto the third steel beam and was provided with vertical restraint to limit any possible uplift. All 'I' beam sections were protected with the 50 mm thick vermiculite based boards where joints between adjoining boards were sealed with a high temperature adhesive.

The floor supported a uniformly distributed load of 2.0 kN/m<sup>2</sup> over the 3250 mm span. The test load was specified by the sponsor of the test.

## Test Results:

<b>Structural adequacy (Loadbearing Capacity)</b>	180 minutes*
<b>Integrity performance</b>	180 minutes*
<b>Insulation performance</b>	180 minutes*

\*The test was discontinued after a period of 180 minutes.

**Date of Test** 15<sup>th</sup> November 2017

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## Signatories

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Responsible Officer  
**G. Edmonds\***  
Senior Testing Officer



Head of Department  
**S. Hankey\***  
Business Unit Head

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

Report Issued

Date : 14<sup>th</sup> May 2018

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# Test Procedure

## Introduction

The specimen was of a loadbearing concrete floor construction. The test was conducted in accordance with AS 1530.4: 2014, 'Methods for fire tests on building materials, components and structures' - Part 4: Fire-resistance tests for elements of construction.

The specimen was judged on its ability to comply with the performance criteria for structural adequacy (loadbearing capacity), integrity and insulation, as required by BS EN 1365-2: 2014.

## Fire Test Study Group/EGOLF

Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and 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.

## Instruction to test

The test was conducted on the 1<sup>st</sup> December 2017 at the request of **New Zealand Heavy Engineering Research Association** who acted as technical consultant to **ComFlor Building Systems**, the sponsor of the test.

## Test Specimen Construction

A comprehensive description of the test construction is given in the Schedule of Components. The description is based on a detailed survey of the specimen and information supplied by the sponsor of the test.

The decking of the floor assembly was provided by the sponsor of the test. All the other components that went to make the test specimen were provided by **Exova Warringtonfire** and their representatives. The specimen was cast, by representatives of **Exova Warringtonfire**, on the 3<sup>rd</sup> August 2017 and stored under cover to dry naturally until the test date.

## Installation

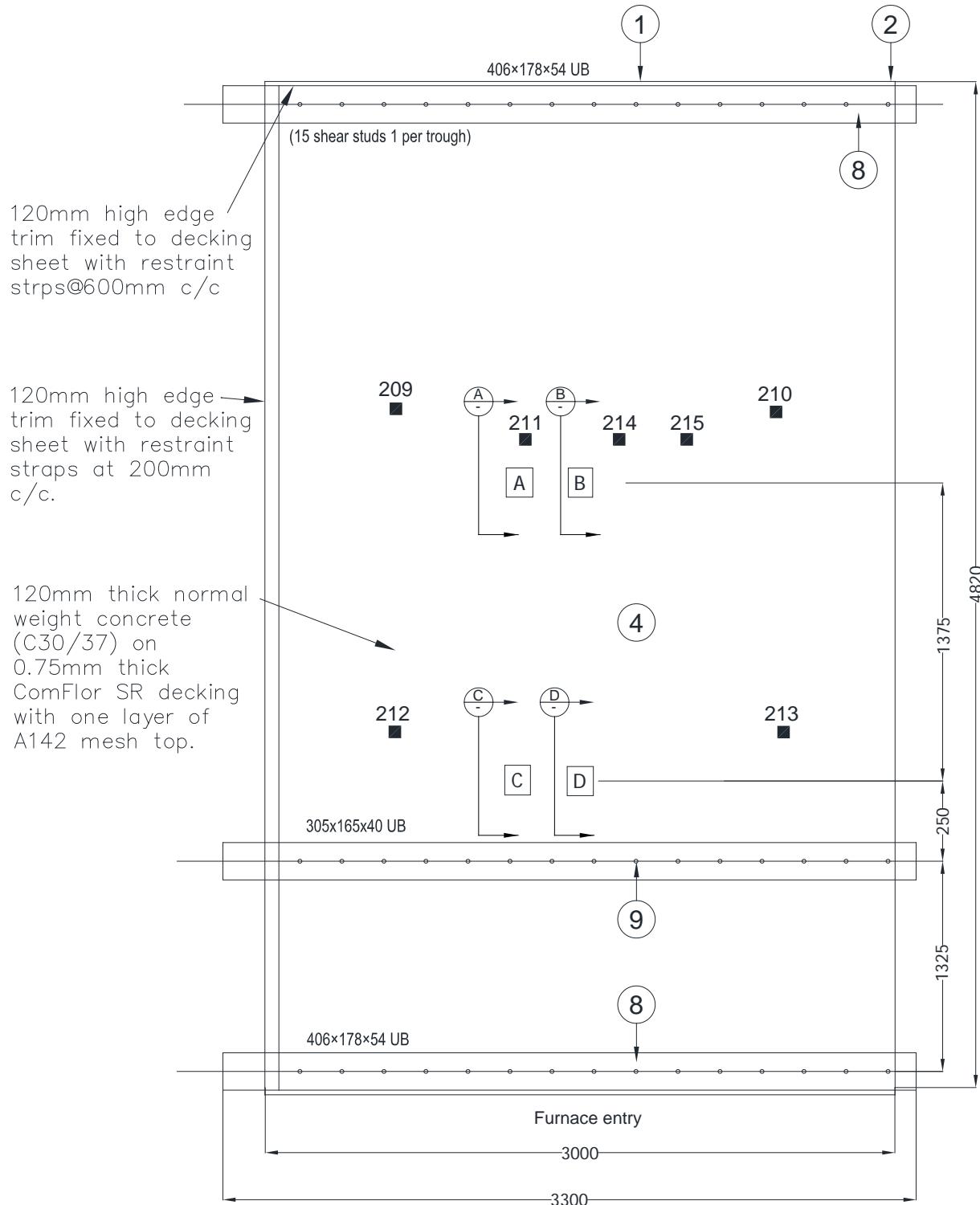
The floor assembly was installed onto the furnace chamber two days before the test by representatives of **Exova Warringtonfire**.

## Sampling

**Exova Warringtonfire** was not involved in any selection or sampling procedures of the specimen or any of the components.

# Test Specimen

Figure 1- General Elevation of Test Construction



Plan view on test specimen

■ Denotes thermocouple layout

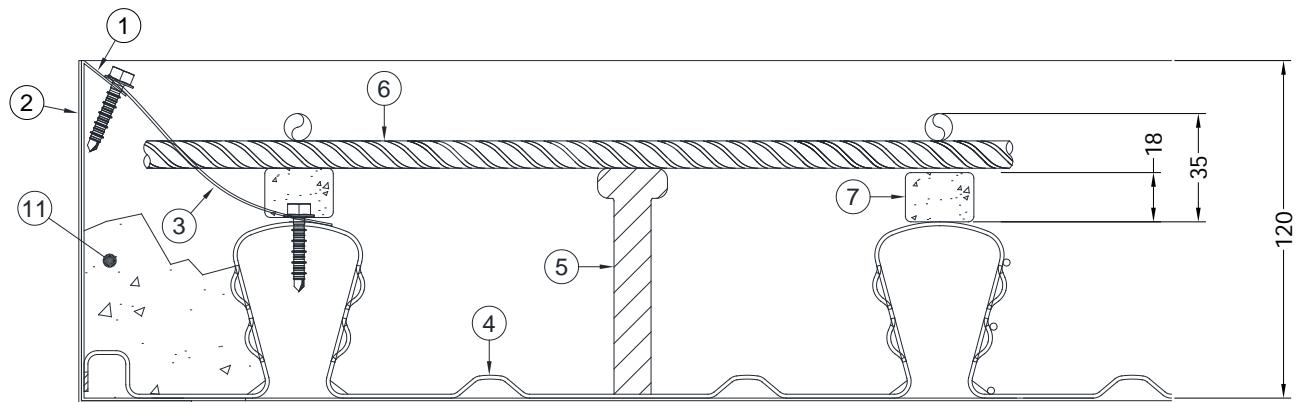
Do not scale. All dimensions are in mm

Figure 2 – Cross Section Details Through Floor Construction



Do not scale. All dimensions are in mm

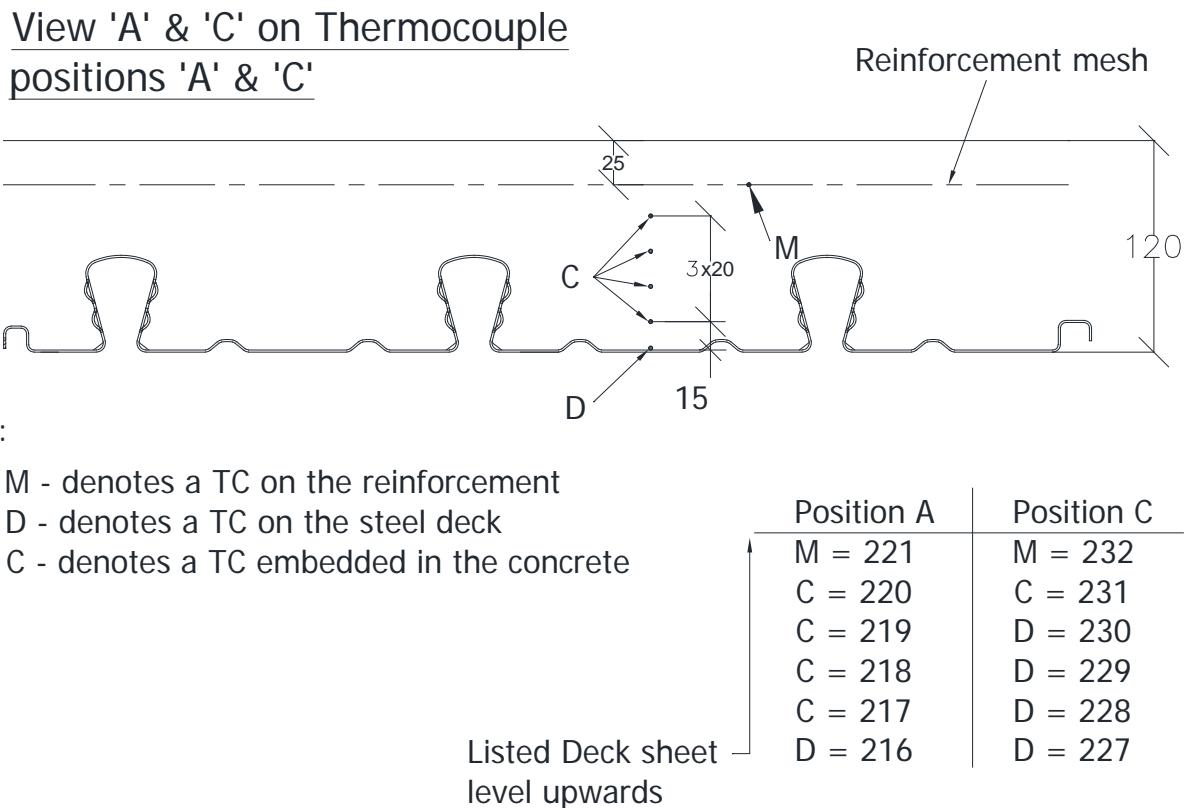
Figure 3 – Cross Section Details Through Floor Construction



Cross section through floor  
transversal edge

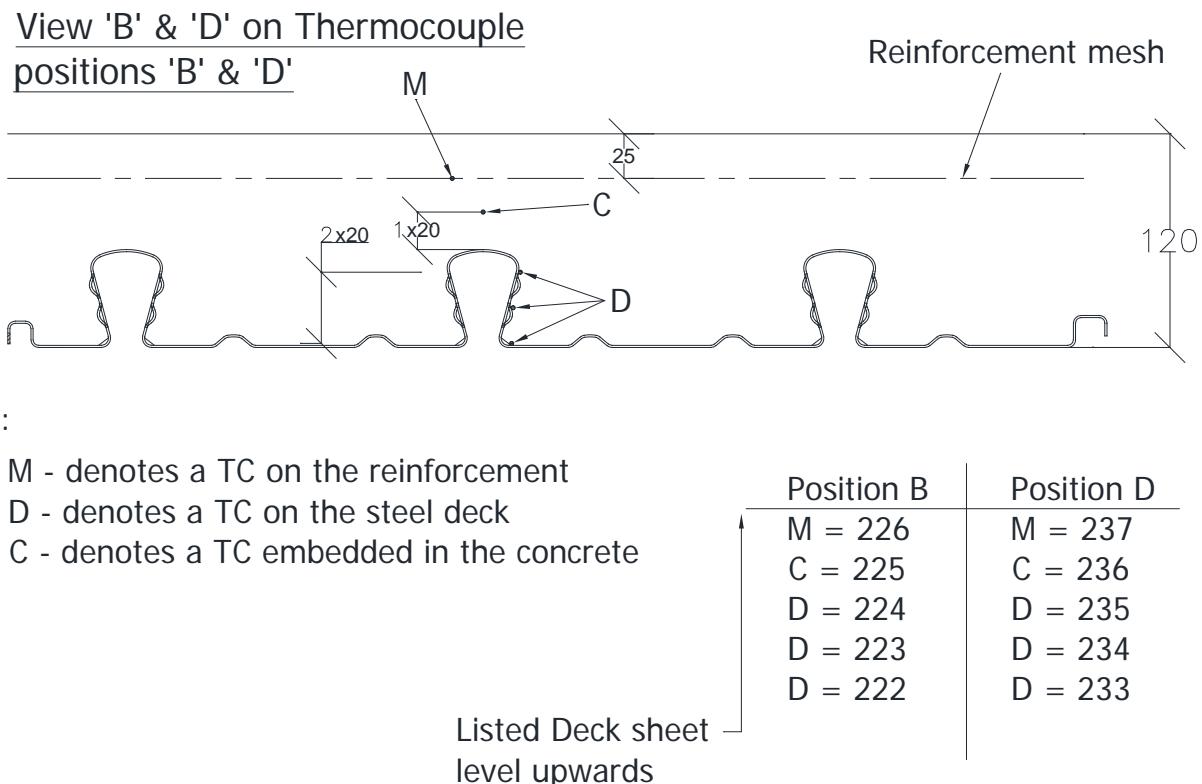
Do not scale. All dimensions are in mm

Figure 4 – Thermocouple Positions 'A' & 'C'



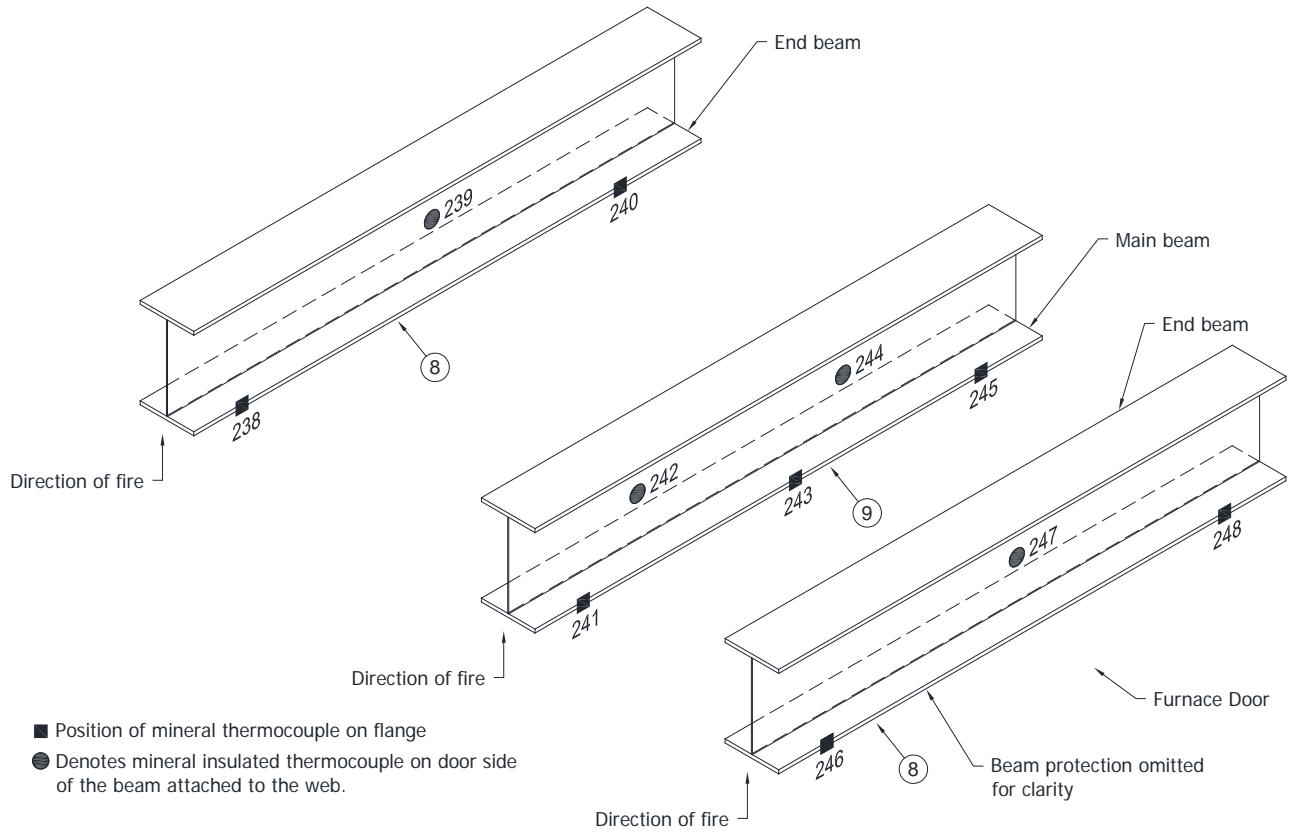
Do not scale. All dimensions are in mm

Figure 5 – Thermocouple Positions 'B' & 'D'



Do not scale. All dimensions are in mm

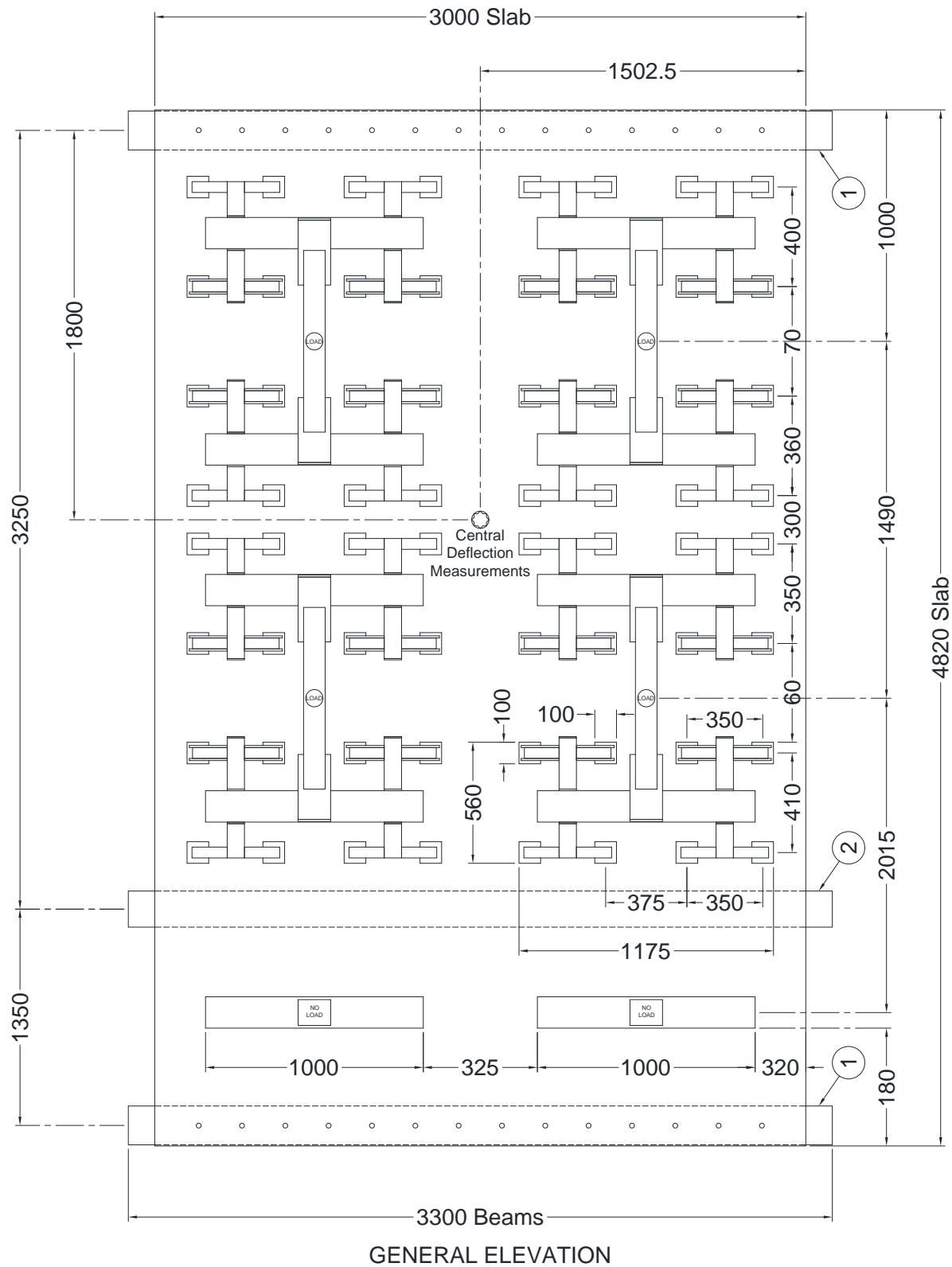
Figure 6 – Thermocouple Layout Details



Isometric view on beams showing  
thermocouple layout

Do not scale. All dimensions are in mm

Figure 7 – Load Details



Do not scale. All dimensions are in mm

# Schedule of Components

(Refer to Figures 1 & 7)  
(All values are nominal unless stated otherwise)  
(All other details are as stated by the sponsor)

<u>Item</u>	<u>Description</u>
<b>1. Perimeter Channel</b>	
Manufacturer	: Steel & Tube - ComFlor®
Material	: Galvanised steel
Profile size	: 120 mm x 63 mm x 1 mm thick with 19 mm return edge
Fixing method	: Fixed to decking with Tek screws ø 6 mm x 30 mm long at 600 mm centres and braced with perimeter straps (item 2)
<b>2. Corner Brace</b>	
Manufacturer	: Steel & Tube - ComFlor®
Material	: Galvanised steel
Overall size	: 60 mm x 60 mm x 1 mm thick Angle
Fixing method	: Through screwed to perimeter channel with 4 off Tek screws ø 6 mm x 30 mm long
<b>3. Perimeter Straps</b>	
Manufacturer	: Steel & Tube - ComFlor®
Material	: Galvanised steel
Overall size	: 220 mm x 25 mm x 1 mm thick
Fixing method	: Screwed to top of perimeter channel and decking with Tek screws ø 6 mm x 30 mm long at 200 mm centre's
<b>4. Decking</b>	
Manufacturer	: Steel & Tube - ComFlor®
Reference	: ComFlor SR Steel decking
Material	: Galvanised steel
Overall profile size	: 55 mm x 600 mm cover width
Thickness	: 0.75 mm
Fixing method	: Through screwed to perimeter channel with 4 off Tek screws ø 6 mm x 30 mm long. Decking sheets fit together tongue and groove and screwed with Tek screws ø 6 mm x 30 mm long
<b>5. Concrete Anchor Shear Studs</b>	
Manufacturer	: Koster & Co GmbH
Reference	: 22685
Material	: Mild steel
Size	: ø 19 mm x 150 mm(I) SD1, DIN EN ISO 13918, ETA 03/0039
Fixing method	: Stud welded to decking onto structural steel. 15 shear studs along structural beams (1 per trough)
<b>6. Steel Reinforcement</b>	
Manufacturer	: BRC Asia Ltd
Material	: Mild steel mesh
Reference	: WA8 ribbed wire mesh reinforcement, SS561: 2010, B500A
Overall size	: ø 6 mm

<u>Item</u>	<u>Description</u>
<b>7. Spacer Block</b>	
Material	: Concrete
Overall size	: ø10 mm 18 mm x 33 mm x 28 mm
Fixing method	: Tied with steel tie-wire at 600 mm centre's
<b>8. End Beams</b>	
Material	: Mild steel, UB: BS EN10025: 1993, Grade S355JR
Overall size	: 406 mm x 178 mm x 10 thick flange x 7 mm web x 3300 mm long
Fixing method	: Stud welded to underside of decking. 3 off rows with 15 studs per trough (45 studs in total)
<b>9. Middle Beam</b>	
Material	: Mild steel, UB: BS EN10025: 1993, Grade S355JR
Overall size	: 305 mm x 165 mm x 10 thick flange x 7 mm web x 3300 mm long
Fixing method	: Stud welded to underside of decking. 3 off rows with 1 stud per trough (27 studs in total)
<b>10. Beam Protection</b>	
Manufacturer	: Promat Ltd
Reference	: Vicuclad board
Material	: Vermiculite based board
Grade	: 1050
Thickness	: 50 mm
Noggins	
i. material	: Vicuclad board
ii. width	: 50 mm
iii. overall size	: Cut to fit within flanges of beams
Fixing methods	
i. noggins to steel	: Friction fitted and bonded
ii. cladding	: Stitch nailed, and bonded to noggins and steelwork, all butt joints between adjoining boards were filled with adhesive
Adhesive	
i. manufacturer	: Rockwool™
ii. reference	: Fire Pro Glue
iii. batch No.	: 1305004
<b>11. Concrete Slab</b>	
Material	: Grade C30/37 with a nominal compressive cube strength of 40 N/mm <sup>2</sup>
Cement	: CEM 1 42.5N
Aggregate	
i. type	: Limestone
ii. size	: 4 mm - 20 mm
Sand	: Sand
Overall size	: 4790 mm long x 3005 mm 120 mm thick
Moisture content	: 4.5% dry weight (sample taken from test specimen)

# Instrumentation

<b>General</b>	The instrumentation was provided in accordance with the requirements of the Standard.
<b>Furnace</b>	The furnace was controlled so that its mean temperature complied with the requirements of AS 1530.4: 2014 Clause 2.11.1 using eight plate thermometers, distributed over a plane 100 mm from the exposed surface of the test construction.
<b>General</b>	Thermocouples were provided to monitor the unexposed surface of the specimen, and the output of all instrumentation was recorded at no less than one minute intervals as follows:
<b>Thermocouples 210 to 214</b>	At five positions on the unexposed surface of the loadbearing section of the specimen, one approximately at the centre and one at approximately the centre of each quarter section of the specimen.
<b>Thermocouples 214 and 215</b>	At two positions on the unexposed surface of the loadbearing section of the specimen located above a trough and a peak in the profile.  For information purposes only, additional thermocouples were included within the assembly and the central steel beam, at various positions, to provide temperature data.
	The locations and reference numbers of the various unexposed surface and internal thermocouples are shown in Figures 1, 4, 5 and 6.
<b>Roving Thermocouple</b>	A roving thermocouple was available to measure temperatures on the unexposed surface of the specimen at any position, which might appear to be hotter than the temperatures indicated by the fixed thermocouples.
<b>Loadbearing Capacity Criteria</b>	A linear deflection transducer was provided at the geometric centre of the unexposed surface of the loaded area to record the deflection of the floor.
<b>Integrity criteria</b>	Cotton pads and gap gauges were available to evaluate the integrity of the specimen.
<b>Furnace Pressure</b>	The pressure differential relative to the laboratory atmosphere, at a position 100 mm below the underside of the floor assembly, was calculated to be 20 ( $\pm 2$ ) Pa.

## Test Observations

<b>Time</b>	All observations are from the unexposed face unless noted otherwise.
<b>mins    secs</b>	The ambient air temperature in the vicinity of the test construction was 16°C at the start of the test with a maximum variation of +2°C during the test.
<b>00      00</b>	<b>The test commences.</b>
<b>-00     15</b>	The test load is applied. The recorded deflection is 0.5mm.
<b>00      00</b>	Heating conditions of the test commence.
<b>15      00</b>	Steam begins to be released from the unexposed face of the specimen.
<b>20      00</b>	The steam release increases.
<b>28      00</b>	The steam release continues.
<b>30      00</b>	The specimen floor is maintaining its loadbearing capacity, integrity and insulation.
<b>35      00</b>	Hairline cracks are forming in the surface of the concrete.
<b>40      00</b>	The deck is radiating an orange colour on the exposed face.
<b>60      00</b>	The specimen floor is maintaining its loadbearing capacity, integrity and insulation.
<b>95      00</b>	The steam release is decreasing slightly.
<b>110     00</b>	A crack, several millimetres wide and deep, has formed in the concrete over the central steel beam.
<b>120     00</b>	The specimen floor is maintaining its loadbearing capacity, integrity and insulation.
<b>125     00</b>	Steam release has virtually ceased.
<b>140     00</b>	There are no visible significant changes to the unexposed and exposed faces of the floor assembly.
<b>180     00</b>	The specimen floor is maintaining its loadbearing capacity, integrity and insulation.  At the request of the client the test is discontinued.

## Test Photographs

The exposed face  
of the test  
specimen prior to  
testing



The unexposed  
face of the test  
specimen prior to  
the start of the  
test



The unexposed face of the test specimen after a test duration of 30 minutes



The unexposed face of the test specimen after a test duration of 62 minutes



The unexposed face of the test specimen after a test duration of 90 minutes



The unexposed face of the test specimen after a test duration of 120 minutes



The unexposed  
face of the test  
specimen after a  
test duration of  
180 minutes



# Temperature, Deflection & Pressure Data

Mean Furnace Temperature, Together with the Temperature/Time Relationship Specified in the Standard

Time Minutes	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	29
5	576	578
10	678	677
15	739	745
20	781	790
25	815	809
30	842	835
35	865	862
40	885	877
45	902	896
50	918	913
55	932	930
60	945	943
65	957	956
70	968	968
75	979	980
80	988	983
85	998	992
90	1006	1001
95	1014	1011
100	1022	1021
105	1029	1024
110	1036	1030
115	1043	1036
120	1049	1044
125	1055	1050
130	1061	1059
135	1067	1065
140	1072	1073
145	1077	1079
150	1082	1082
155	1087	1087
160	1092	1093
165	1097	1098
170	1101	1103
175	1106	1108
180	1110	1114

**Individual and Mean Temperatures Recorded on the Unexposed Surface of the Specimen**

Time Minutes	T/C Number 209 Deg. C	T/C Number 210 Deg. C	T/C Number 211 Deg. C	T/C Number 212 Deg. C	T/C Number 213 Deg. C	Mean Temp Deg. C
0	18	18	18	19	19	18
5	18	18	18	19	19	18
10	18	18	18	20	19	19
15	19	19	19	24	19	20
20	22	21	21	55	21	28
25	26	24	24	71	25	34
30	31	29	28	76	41	41
35	35	35	33	84	51	48
40	39	41	37	90	57	53
45	43	46	42	91	59	56
50	46	50	47	92	60	59
55	47	53	50	92	61	61
60	44	56	54	93	62	62
65	45	61	56	93	63	64
70	54	67	58	93	66	68
75	55	73	60	93	70	70
80	60	78	60	93	75	73
85	60	83	61	93	79	75
90	55	86	62	94	85	76
95	61	89	63	94	89	79
100	72	93	64	94	93	83
105	67	96	63	94	96	83
110	80	99	65	95	100	88
115	66	102	66	94	103	86
120	67	105	67	95	107	88
125	74	108	68	95	111	91
130	74	110	70	95	115	93
135	76	113	77	95	118	96
140	78	116	91	95	122	100
145	87	119	99	95	127	105
150	85	122	103	95	131	107
155	80	126	108	95	134	109
160	80	130	112	95	139	111
165	93	136	117	95	143	117
170	93	142	122	95	147	120
175	105	149	127	95	154	126
180	97	157	133	95	162	129

**Individual Temperatures Recorded on the Unexposed Surface of the Specimen**

Time Minutes	T/C Number 214 Deg. C	T/C Number 215 Deg. C
0	19	15
5	18	15
10	19	15
15	19	17
20	20	18
25	21	20
30	22	22
35	23	26
40	25	32
45	25	37
50	28	38
55	29	42
60	36	46
65	35	47
70	36	48
75	36	50
80	43	53
85	44	57
90	34	59
95	38	62
100	32	60
105	37	62
110	46	61
115	43	57
120	43	56
125	37	51
130	39	54
135	40	50
140	43	49
145	45	48
150	43	49
155	46	52
160	45	57
165	48	66
170	48	73
175	51	85
180	55	91

**Individual gradient temperatures recorded at Block A**

Time Minutes	T/C Number 216 Deg. C	T/C Number 217 Deg. C	T/C Number 218 Deg. C	T/C Number 219 Deg. C	T/C Number 220 Deg. C	T/C Number 221 Deg. C
0	20	17	17	17	17	17
5	116	83	58	50	22	20
10	173	115	89	80	34	57
15	241	156	110	97	56	84
20	399	248	128	111	84	90
25	496	335	178	126	97	99
30	565	405	232	147	100	100
35	625	463	279	177	102	101
40	663	511	322	204	102	102
45	696	552	360	233	107	102
50	728	590	395	261	114	101
55	761	625	431	293	124	102
60	794	658	471	337	137	101
65	825	686	508	372	153	105
70	848	712	540	402	170	118
75	869	735	569	431	187	133
80	882	755	596	457	204	148
85	898	772	620	482	220	162
90	913	789	641	505	236	176
95	929	804	662	528	252	189
100	942	818	682	550	268	202
105	944	827	695	554	283	214
110	949	831	695	557	295	225
115	953	835	703	572	305	234
120	961	841	714	587	317	245
125	965	845	720	598	328	255
130	977	852	735	617	340	266
135	985	859	748	634	352	278
140	995	866	760	648	365	290
145	1004	873	771	661	377	301
150	1010	880	781	673	388	312
155	1018	887	790	684	399	323
160	1025	897	799	695	410	333
165	1033	905	807	706	420	344
170	1041	913	816	717	430	354
175	1049	922	823	727	441	365
180	1058	931	831	736	451	376

Individual gradient temperatures recorded at Block C

Time Minutes	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	T/C Number 232 Deg. C
0	23	17	16	16	16	16
5	99	56	35	31	20	21
10	148	94	67	67	32	100
15	210	121	100	102	72	103
20	314	167	113	105	93	139
25	414	236	131	109	101	140
30	490	303	162	118	101	132
35	574	364	211	139	103	110
40	636	421	257	169	108	99
45	691	473	299	200	116	99
50	736	519	340	232	132	99
55	773	559	378	264	150	110
60	803	596	414	298	170	147
65	826	626	447	331	191	170
70	849	653	478	359	211	190
75	868	680	506	385	230	209
80	882	703	532	409	248	226
85	896	723	555	430	264	241
90	908	740	576	449	280	254
95	922	755	594	466	295	266
100	936	769	610	483	309	278
105	943	782	626	499	323	288
110	950	792	640	512	336	299
115	958	801	652	523	348	308
120	965	810	664	534	358	317
125	970	816	673	543	369	326
130	978	820	681	550	378	334
135	987	825	687	557	387	341
140	996	829	694	564	395	349
145	1005	835	701	572	403	356
150	1011	840	708	581	412	364
155	1019	846	716	588	420	372
160	1026	852	723	597	429	380
165	1034	858	731	605	437	388
170	1040	864	738	613	446	396
175	1047	869	746	621	455	405
180	1055	874	753	630	463	414

**Individual gradient temperatures recorded at Block B**

Time Minutes	T/C Number	T/C Number	T/C Number	T/C Number	T/C Number
	222 Deg. C	223 Deg. C	224 Deg. C	225 Deg. C	226 Deg. C
0	16	17	19	16	16
5	82	82	73	28	19
10	111	105	103	43	26
15	146	137	116	55	36
20	206	180	148	66	45
25	287	237	186	83	68
30	347	290	214	96	81
35	395	336	248	104	86
40	436	380	279	111	95
45	478	425	310	119	100
50	521	474	384	133	102
55	562	523	434	153	102
60	604	563	446	175	107
65	636	594	464	192	115
70	670	628	491	208	124
75	693	651	511	224	132
80	710	668	524	234	140
85	724	680	539	239	147
90	738	691	557	245	154
95	749	698	572	259	162
100	750	690	583	275	172
105	766	721	676	293	183
110	782	741	703	314	195
115	795	757	722	332	208
120	807	772	738	349	221
125	819	787	757	364	234
130	830	799	776	378	247
135	839	809	787	391	259
140	847	820	797	404	272
145	854	829	807	416	284
150	860	837	815	427	296
155	866	846	825	439	307
160	871	853	835	450	318
165	876	859	845	461	329
170	882	866	852	471	340
175	888	874	860	481	350
180	897	882	869	491	360

**Individual gradient temperatures recorded at Block D**

Time Minutes	T/C Number	T/C Number	T/C Number	T/C Number	T/C Number
	233	234	235	236	237
	Deg. C				
0	20	18	20	16	16
5	96	60	60	23	19
10	125	107	98	34	58
15	195	135	119	61	96
20	289	171	159	77	97
25	347	207	198	91	98
30	410	253	232	97	98
35	471	294	265	103	99
40	525	332	294	106	99
45	571	370	322	113	99
50	611	406	350	120	99
55	644	441	391	130	99
60	675	490	484	148	125
65	708	531	530	168	144
70	733	562	556	188	158
75	762	598	585	206	170
80	786	628	600	223	181
85	802	651	607	239	191
90	814	669	613	253	202
95	826	686	626	266	212
100	840	703	638	278	222
105	845	689	632	289	233
110	852	690	639	299	243
115	860	700	651	309	253
120	866	711	664	319	262
125	872	722	679	329	272
130	878	733	695	340	282
135	876	745	712	351	292
140	875	759	732	362	301
145	879	772	749	374	311
150	884	784	762	386	320
155	890	794	774	397	330
160	897	804	786	408	340
165	904	814	797	419	349
170	911	823	808	429	358
175	918	832	818	440	367
180	926	840	829	450	376

**Individual and mean temperatures recorded on the central supporting beam**

Time Minutes	T/C Number 241 Deg. C	T/C Number 242 Deg. C	T/C Number 243 Deg. C	T/C Number 244 Deg. C	T/C Number 245 Deg. C	Mean Temp Deg. C
0	19	19	17	17	17	18
5	19	20	18	17	17	18
10	22	23	26	20	20	22
15	38	35	42	31	32	36
20	55	61	57	53	49	55
25	73	80	74	74	68	74
30	91	89	91	86	87	89
35	99	97	96	85	95	94
40	102	107	98	77	96	96
45	106	117	105	96	105	106
50	118	127	113	104	121	117
55	135	139	125	115	140	131
60	157	155	145	135	163	151
65	182	174	173	164	189	176
70	207	195	204	192	215	203
75	232	217	234	218	241	228
80	259	240	263	242	267	254
85	283	263	291	265	291	279
90	308	285	316	287	315	302
95	331	307	341	309	339	325
100	353	328	363	330	361	347
105	374	348	385	351	383	368
110	394	368	405	370	406	389
115	413	387	425	390	431	409
120	432	405	443	409	457	429
125	450	422	461	429	483	449
130	467	439	477	449	507	468
135	485	455	493	468	528	486
140	503	472	508	486	548	503
145	522	488	523	505	567	521
150	540	503	537	522	584	537
155	557	519	550	539	601	553
160	574	535	563	557	618	569
165	590	550	576	574	635	585
170	606	566	588	590	651	600
175	622	581	601	606	667	615
180	639	596	613	622	683	631

**Individual temperatures recorded on the loaded section end supporting beam**

Time Minutes	T/C Number 238 Deg. C	T/C Number 239 Deg. C	T/C Number 240 Deg. C
0	17	18	18
5	17	18	18
10	18	19	20
15	21	26	24
20	27	40	33
25	35	55	42
30	44	67	52
35	55	74	64
40	64	82	72
45	72	91	77
50	78	101	80
55	84	110	83
60	89	119	88
65	95	127	93
70	101	135	99
75	108	142	105
80	115	150	112
85	124	158	119
90	134	167	126
95	144	176	134
100	154	185	141
105	163	194	148
110	171	202	155
115	180	210	162
120	189	218	169
125	197	226	175
130	206	233	182
135	215	241	188
140	224	248	194
145	232	255	200
150	239	261	205
155	247	268	209
160	255	274	214
165	263	280	218
170	270	286	222
175	278	291	226
180	286	297	230

Individual temperatures recorded on the cantilever section end supporting beam

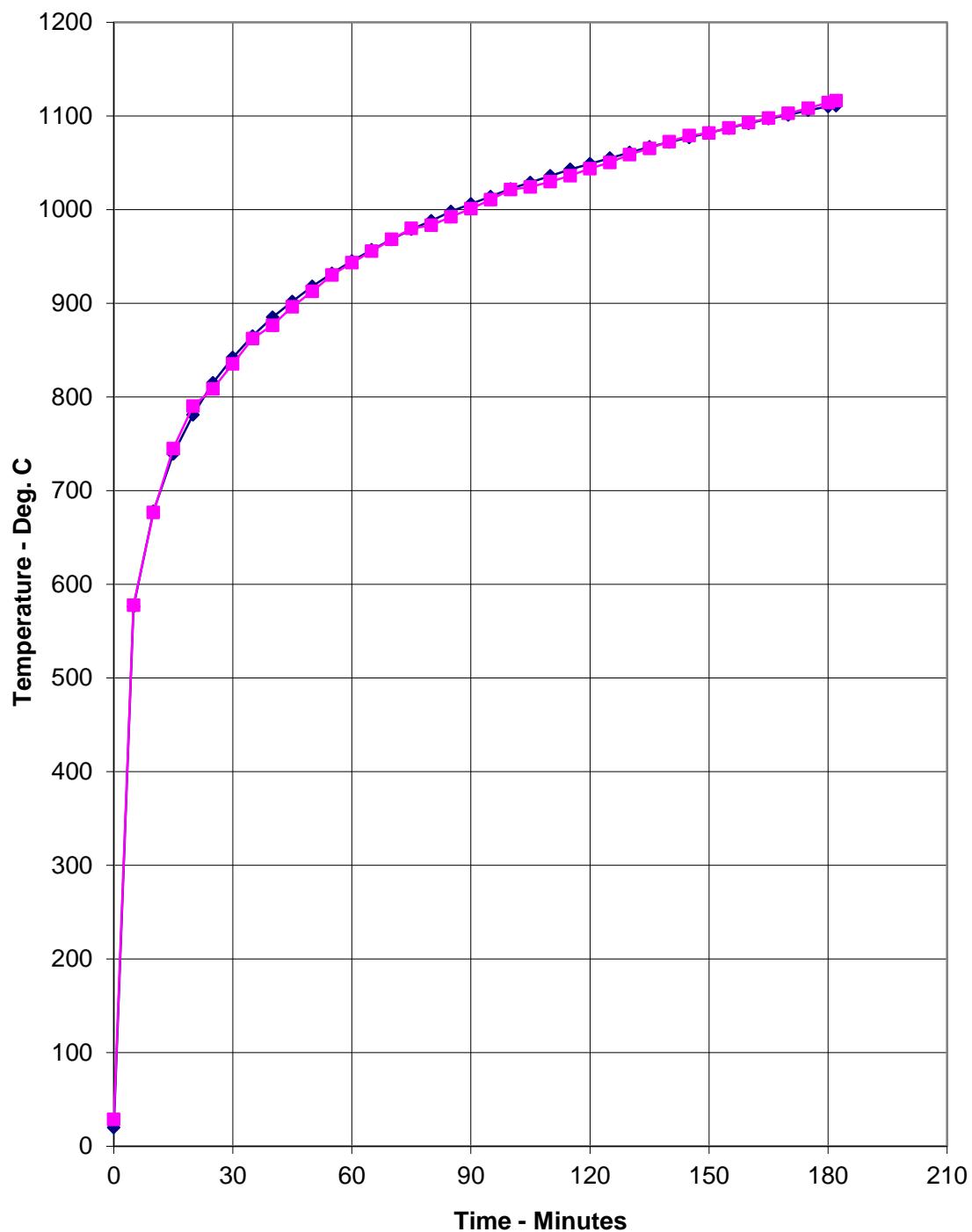
Time Minutes	T/C Number	T/C Number	T/C Number
	246	247	248
	Deg. C	Deg. C	Deg. C
0	17	*	17
5	17	*	17
10	18	*	18
15	20	*	21
20	27	*	19
25	35	*	22
30	46	*	*
35	57	*	*
40	65	*	*
45	72	*	42
50	77	*	*
55	79	*	*
60	81	*	*
65	83	*	*
70	86	*	*
75	90	*	*
80	94	*	*
85	99	*	*
90	104	*	*
95	108	*	*
100	113	*	*
105	119	*	*
110	125	*	*
115	131	*	*
120	137	*	*
125	143	*	*
130	149	*	*
135	155	*	*
140	161	*	*
145	168	*	*
150	174	*	*
155	181	*	*
160	187	*	*
165	194	*	*
170	200	*	*
175	207	*	*
180	213	*	*

\*Thermocouple Malfunction

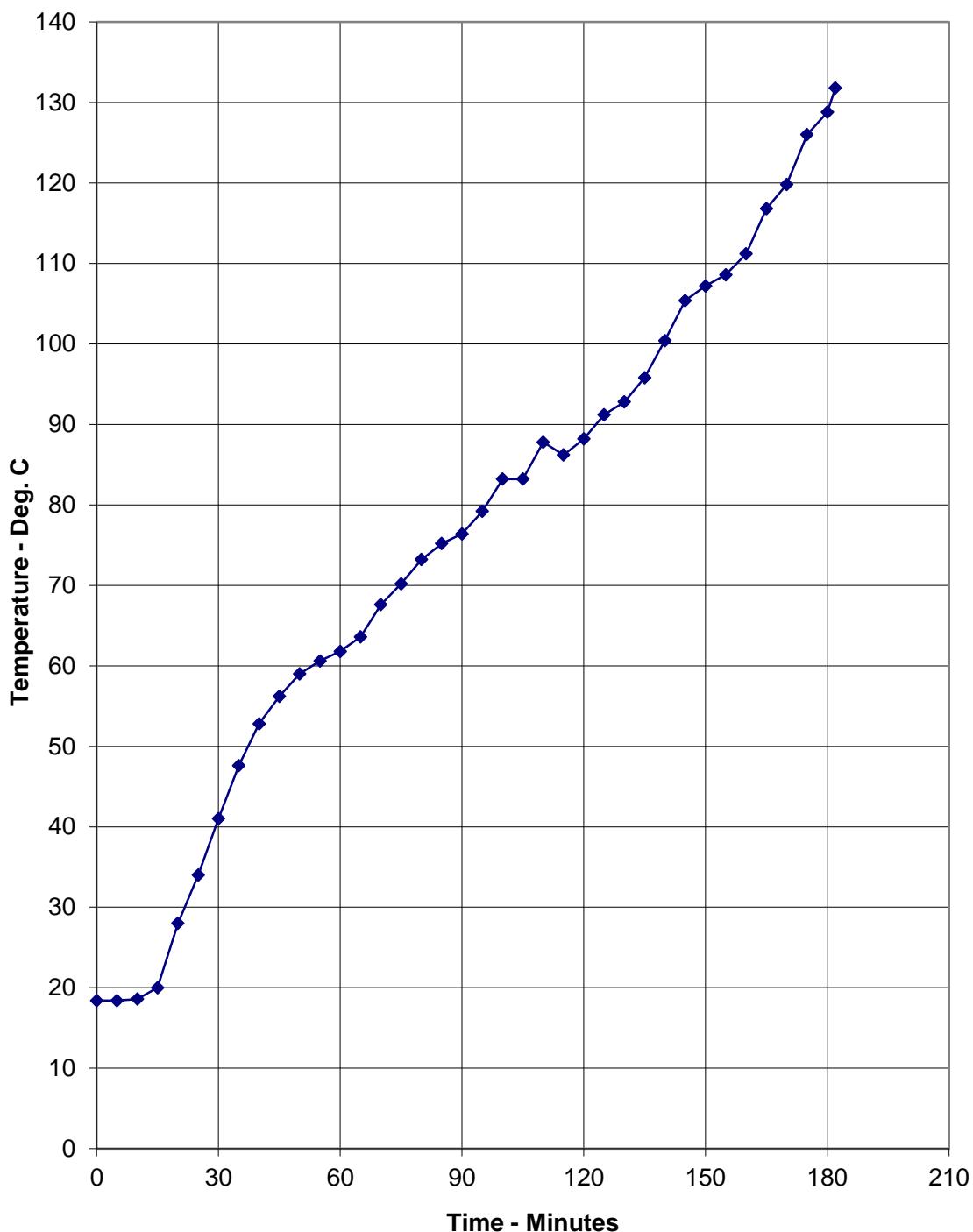
**Central Vertical Deflection of the Floor**

Time Minutes	Central Vertical Deflection mm	Rate of Deflection mm/min
0	0.0	0
5	15.8	2.4
10	25.9	1.3
15	30.2	0.9
20	33.8	1.0
25	36.8	0.6
30	39.6	0.5
35	42.5	0.5
40	45.3	0.6
45	48.1	0.5
50	50.7	0.6
55	52.5	0.3
60	54.3	0.2
65	54.8	0.1
70	56.4	0.4
75	57.9	0.3
80	59.2	0.3
85	60.3	0.4
90	62.2	0.5
95	64.0	0.3
100	65.6	0.3
105	67.4	0.5
110	69.2	0.4
115	71.0	0.4
120	72.6	0.2
125	74.8	0.6
130	77.0	0.6
135	79.5	0.7
140	81.6	0.4
145	85.1	0.8
150	88.8	1.0
155	92.5	0.7
160	96.4	0.9
165	100.5	0.7
170	104.1	0.6
175	108.6	0.7
180	112.6	0.6

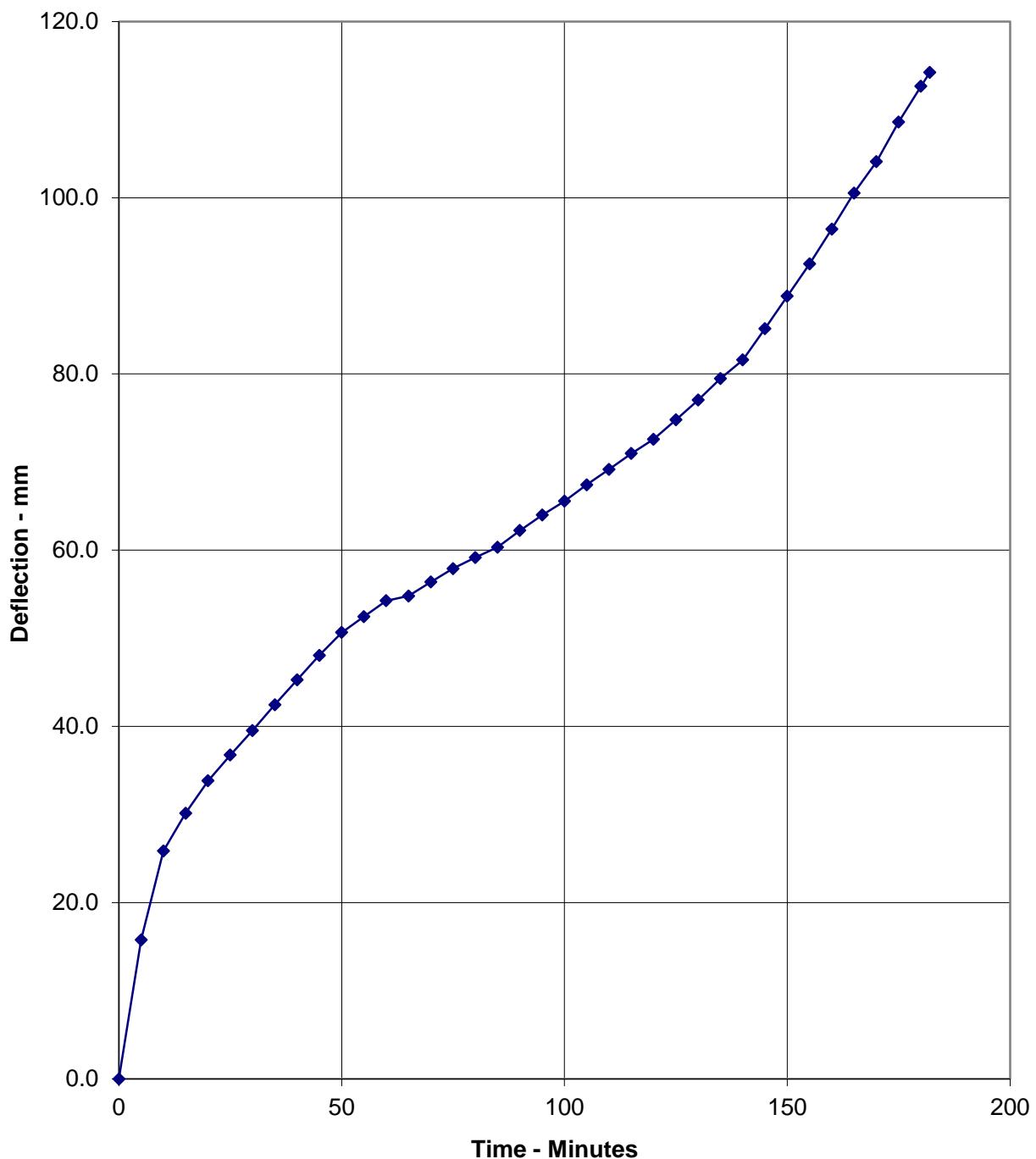
**Graph Showing Mean Furnace Temperature, Together with the Temperature/Time Relationship Specified in the Standard**



**Graph showing Mean Temperatures Recorded on the Unexposed Surface of the Specimen**



**Graph showing recorded central vertical deflection of the specimen**



## Performance Criteria and Test Results

<b>Structural Adequacy (Loadbearing capacity)</b>	The limiting deflection and the limiting rate of deflection for the specimen, as specified by the Standard, are calculated as 220 mm and 9.8 mm per minute respectively, based on a floor depth of 120 mm (d) and a clear span of 3250 mm (L). The specimen satisfied these criteria for the test duration of 180 minutes.
<b>Integrity</b>	<p>It is required that the specimen retain its separating function, without:</p> <ul style="list-style-type: none"><li>▪ causing ignition of a cotton pad when applied</li><li>▪ permitting the penetration of a gap gauge in the prescribed manner</li><li>▪ sustained flaming on the unexposed surface</li><li>▪ Integrity failure also occurs simultaneously with loadbearing capacity failure.</li></ul> <p>The integrity requirements were satisfied for the test duration of 180 minutes.</p>
<b>Insulation</b>	<p>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 occurs simultaneously with integrity failure. The insulation requirements were satisfied for the test duration of 180 minutes.</p>

## Ongoing Implications

<b>Limitations</b>	This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in AS 1530.4: 2014.
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# Conclusions

<b>Evaluation against objective</b>	A specimen of a loadbearing composite concrete floor assembly supported by three 'I' section steel beams has been subjected to a fire resistance test in accordance with the procedures given in AS 1530.4: 2014.
<b>Loadbearing capacity</b>	180 minutes*
<b>Integrity performance</b>	180 minutes*
<b>Insulation performance</b>	180 minutes*

\*The test was discontinued after a period of 180 minutes.