

	Name	Company	Email
<b>To</b>	Jamel Sadiki	Built	<a href="mailto:jamelsadiki@built.com.au">jamelsadiki@built.com.au</a>
<b>Date</b>	01/03/2023	<b>Job no</b>	SY210113
		<b>CA no.</b>	6.1
<b>Project</b>	Lands Building – 23 Bridge Street, Sydney		

Dear Jamel

This letter is provided in response to the below advice received from Heritage NSW in response to MOD 18 on 08/02/23.

"It should be noted that the company that produces CAP508 has tested this product in the CSIRO testing lab with a lath and plaster ceiling and a CAP508 coating of 700 microns. This treatment achieved an FRL of 90/90/90 and a 60 min RISF."

This letter does not constitute an assessment and must only be used for improved clarity on the subject.

## 1. AS 1530.4:2014 test method

AS 1530.4:2014 provides methods for determining the fire resistance of various elements of constructions when subjected to standard fire exposure conditions. Section 2 of this standard provides general requirements for all types of constructions. Section 4 sets out the procedures for horizontal separating elements exposed to heating from the underside.

When testing a framed floor-ceiling system for the purpose of determining its fire resistance level (FRL), thermocouples are located on the unexposed (top – floor) surface of the floor lining in accordance with AS 1530.4:2014. The standard specifies that insulation failure under clause 2.13.3 is to be determined as follows:

- (a) *the average temperature of the unexposed face of the test specimen, as measured by the thermocouples specified in Clause 2.2.3.1, exceeds the initial temperature by more than 140 K; or*
- (b) *the temperature at any location on the unexposed face of the test specimen exceeds the initial temperature by more than 180 K.*

Additionally, for framed floor/ceiling systems, thermocouples are incorporated on the top side of the exposed (bottom – ceiling) lining to measure resistance to the incipient spread of fire (RISF). Failure with respect to RISF criterion is determined under clause 4.9.1 as shown below.

*Failure in relation to incipient spread of fire shall be deemed to have occurred when the maximum temperature of the thermocouples specified in Clause 4.4.4.1 exceeds 250°C.*

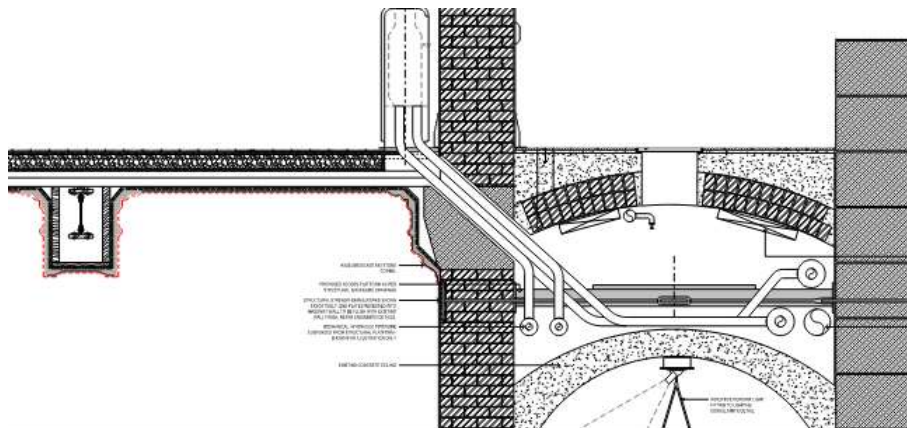
## 2. Evidence from fire test data (FSH 1343:CAP508)

FSH 1343 consisted of a timber framed floor system lined on the exposed (bottom – ceiling) face with one layer of nominally 16-17 mm thick fibrous plaster boards. The floor joists were clad on the unexposed (top – floor) face using 20 mm thick Cyprus Pine tongue and groove floorboards. The fibrous plaster was painted on the exposed face with CAP 508 intumescent paint with a nominal thickness of 700 microns.

The measurements from the FRL thermocouples indicated that insulation failure – as specified in AS 1530.4:2014 – did not occur for a period of not less than 92 minutes. Structural adequacy and integrity criteria were also maintained for the same period. The measurements from the RISF thermocouples indicated that RISF failure occurred at 76 minutes.

### 3. Lands existing conditions and on-site system

It is understood that the fire strategy for the Lands project has the corridor voids in the same fire compartment as the floor above – linking the corridor voids into the ceiling cavity as shown in Figure 1.



**Figure 1 Corridor void linking into the fire compartment above via the framed floor-ceiling**

Due to this compartmentation definition, the floor-ceiling cavity and the top floor lining effectively become redundant, and the bottom ceiling lining – which in this case is timber lath and plaster – becomes the only fire separating element against vertical fire spread. I.e the FRL is now required to be measured on the top side of the timber lath and plaster ceiling – rather than on the top side of the floor lining. Consequently, instead of a typical floor-ceiling system incorporating a ceiling lining, a deep cavity, and a top lining, we now have just the ceiling lining required to achieve the full FRL performance with respect to integrity and insulation.

Unlike RISF, FRL is measured against more stringent (lower) temperature thresholds. FSH 1343 exhibited that with 700 microns of CAP coating, the temperatures on the top side of the 16-17 mm thick fibrous plasterboard exceeded 250 °C at 76 minutes. Thus, with a lower temperature threshold, the Lands ceilings (minimum 21mm thick timber lath and plaster), can only be expected to maintain insulation to achieve a 60 min FRL.

### 4. Outcome

The above outlines the key variance between Lands and the CAP508 test arrangement and why the existing testing cannot be relied upon for a 90/90/90 system at Lands. Further fire testing was undertaken with CAP Coatings in an attempt to provide a 90/90/90 for Lands arrangement; however, following the failed pilot fire test 1a, it was decided that subsequent test was not necessary.

However, the fire test data obtained still provided a high degree of confidence in relation to the actual fire performance of the system, where it achieved a 60 min FRL for the Lands on-site arrangement.

Please contact me on (03) 9767 1000 if you have any questions regarding this information.

Yours sincerely

Omar Saad  
Fire assessment  
manager

**Warringtonfire**