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October 8, 2009

John Caldwell
96a Fisher Parade
Pakuranga

Attention: John Caldwell

Dear Sir

RE: 96a Fisher Parade, Pakuranga

As instructed I visited the site late on the afternoon of 07 October 2009

Seven samples of aerated concrete were removed from the dwelling. These were bagged and tagged, and taken to my office where they were oven dried to determine their relative moisture content

The test involved weighing the samples, and then oven drying them for several hours in a small fan oven with temperature kept at between 100-115C. The samples were then weighed, dried some more then weighed again until the sample weight was considered stable and the material deemed free of residual moisture. This is the only definitive method for testing a material like Ytong

Details are recorded on the following table.

It has been put forward that the moisture content of the walls of the property are in some places 99%. This was based on the use of a capacitance or dielectric constant type moisture meter. For such figures to be correct a 1kg block of wall cladding would need to increase in weight to 1.99kg. Even though the material is aerated lightweight concrete this appears impossible. I commented briefly in an email that NDT (non destructive testing)moisture meters of the type used only have a reasonable degree of accuracy when used on the designed material they are calibrated for and it must be homogenous i.e. all timber not timber covered with building wrap and fibrecement for instance.

It may be that the aluminium or other materials used in the manufacture of the material have resulted in low resistivity of the material resulting in aberrant readings.

The samples were taken from what I understand were high reading areas. In addition I lifted carpet directly below two of the areas (hall cupboard that backs on to the shower and the front external corner of the TV / living room. In both cases smoothedge was unstained, smoothedge hooks were pristine with no sign of corrosion and carpet had no sign of fungal stain on its backing. If moisture were present in the walls in concerning quantities damage to carpet is more than likely.

I also took internal humidity readings in the walls in areas adjacent to where samples were removed. (There is a direct correlation between internal humidity and free moisture in concrete – I have used this widely accepted method for some years) This was done using a Trotec 4mm dia temp/humidity probe. These were checked against the Trotec table for anhydrous concrete and none were considered concerning.

A comment was also made that the balcony etc doesn't have flashings. This was not an aspect I considered but would comment that this is a timber free home that does not use traditional materials. This is not unusual and is something the Building Act encourages. Basically the Act divides buildings into two types – traditional and others. Extensive details for traditional NZ homes are included in E2/AS1 2004 ver. and these are called acceptable solutions. Other homes such as this one are acceptable but the relevant phrase is "alternative solutions". These require independent design, and a stronger assessment by BCA's before permits and CCC's are issued. It follows that alternative solutions are not required to follow traditional methods of flashing design etc - they may have alternative but still acceptable methods to handle weathertightness issues and/or the materials may be so different that weathertightness is not as much of an issue as it would be in a timber framed dwelling.

It is inaccurate to suggest this dwelling has to meet the requirements of either E2/AS1 acceptable solutions or NZS 3604 as its construction is outside those references.

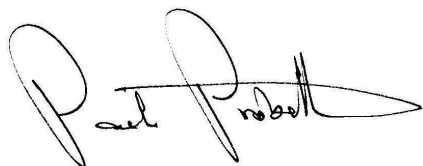
I specifically did not make a full inspection of the property but did do a quick walk around the exterior and was not aware of blisters, cracks; fading and staining that are often associated with leaky block buildings I have had the misfortune to inspect.

In addition a partial thermographic inspection was made of the exterior using a FLIR BCam SD (I'm rated for this camera and have completed training to Level 2 with the Infrasppection Institute) Results were relatively good and did not indicate anomalies that would be consistent with moisture intrusion problems.

It must be appreciated that my prime purpose in visiting the site was to take samples for material analysis, not to do a building inspection.

Date: 08-10-09 Site : 96a Fisher Parade				Material : Lightweight Ytong concrete cores approx 40mmD x 45mm L		
Technician : Paul Probett						
Test method : Oven drying – gravimetric method Equipment : Radiant fan oven, Digital thermometer with K type probe, Ohaus digital balance 0.001g Time 3hrs						
Calculation : $\frac{\text{Wet weight} - \text{Dry weight}}{\text{Dry weight}} \times \frac{100}{1} = \text{MC\%}$						
No	Area	Wet weight	Dry weight	Net Moisture Content as %	Recognized EMC % (Equilibrium %)	Comment
1	Garage wall 600mm above FL	64.824g	62.259g	4.1%	Refer manufacturer's literature	Visually unchanged
2	Same as No 1 but 2.1m above FL	54.242g	51.790g	4.7%	Ditto	Ditto
3	LH of Laundry door 2.2m above FL	62.1426	59.939g	3.6%	Ditto	Ditto
4	Above garage fridge 2.3m above FL	52.668g	49.702g	5.9%	Ditto	Ditto
5	Hall LH wall by office Low level	60.826g	degraded sample	No result	No result	N/A
6	TV /family room ext cnr by slider 300mm above FL	65.316g	61.114g	6.8%	Ditto	Ditto
7	Same room as No 6 side wall rear cnr 250mm above FL	51.445g	48.391g	4.2%	Ditto	Ditto

Yours faithfully



Paul Probett NZCB, MNZIBS, MBOINZ, AAMINZ, AssMLEADR, ANZLS
Member Society for Construction Law, Member Claddings Institute, Member
Adjudicators Association, BRANZ Adjudicator, ABSA
Ex BRANZ Accredited Adviser, Infraspection Institute Thermographer