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### WHEN IS A CONCRETE CRACK A DEFECT?

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#### Introduction

By way of introduction I will consider and discuss initially what a “Defect” is in the context of definitions in an attempt to narrow down the uncertainty which confronts contractors, experts and the judiciary alike. By examining the question of what constitutes whether a crack is acceptable or not, the answer to this vexed question will be done by

drawing upon select standards, legislation and case law.

I will then look at the duties and responsibilities of the Expert Witness and highlight an interesting case recently decided in the Supreme Court dealing with rejection of expert evidence.

In concluding I will discuss a landmark High Court case as to what remedial work, is both “necessary” and “reasonable”, once it is established that a defect in fact exists.

#### What is “Concrete”?

In analysing the words when is a “concrete crack a defect”. We will first look at the meaning of word “concrete” as it relates to a defect.

In Australia, as in so many parts of the developed world, a multitude of books have been written on this topic. There exists extensive research into all manner of concrete behaviour in various situations and applications for example as in fire, under loadings extreme loading, water, cyclic loading etc.

Further there exists many standards of practice, for example AS3600 – Concrete Structures Code and many accompanying

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standards defining the many compositions and forms that concrete can take. For example AS 1315: - Portland Cement, AS 3972-1997: Portland and blended cements and so on.

There also exists Organisations and Associations of which their members more often than not have spent their lifetimes studying, researching and writing about concrete or designing with concrete. (*The Concrete Institute is one such organisation on point!*)

So with so much extensive work already done in this area, by so many of my learned colleagues, I will not even try to attempt to venture into this arena here.

### What is a “Crack”?

The Shorter Oxford dictionary defines a “crack” as:

*“A break in which the parts do or do not remain in contact; a fissure; a partial fracture” or “A flaw, deficiency or unsoundness”*

I believe you either see one or you don't. There is no magic here! A crack is a crack!

This leaves us with last term, what is a defect? As you will soon appreciate, this is not so straight forward, and this is probably the reason why most of you are here tonight!

Unfortunately if you are expecting the definitive answer on what is a “defect” you may well leave a little disappointed tonight. Although I will not be able to give you this definitive answer, I will attempt to show the way the law may attempt to define what a defect is, but more importantly once a defect has been identified what happens next or who's fault is it and what is the appropriate remedy?

### What is meant by “Defective”?

A defect is a falling short.<sup>1</sup> Defective Work is whenever the works fall short of a standard that it is supposed to meet<sup>2</sup> or is not in conformity with the contract. Generally, but not always, defective work is a breach of the contract and, in the absence of contractual provisions to the contrary, will give rise to an entitlement in the proprietor to rectify the defective work and claim damages against the defaulting party (ie Engineer, Building, Subcontractors, Supplier etc.)

### Standards

Broadly speaking, standards are imposed upon construction work by:

- The express provisions of contracts;
- The general law of contract;
- The law of tort (negligence); and
- Statutory obligations (ie Building Act 1993, Building Regulations 2006, BCA etc)

To discuss the above in any detail and to do the topic justice, an entire lecture could be devoted to the above four (4) points alone. We will though for the purposes of this seminar talk in a general sense about the standard expected from the perspective of some common standards of practice.

The Building Commission has produced a publication titled the **“Guide to Standards and Tolerances – 2002 Ed.”** The purpose of the guide is to indicate the Building Commissioners view of

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<sup>1</sup> Darter, J., Sharkey, J., 1990, *Building and Construction Contracts in Australia*. Law Book Company: Sydney, Ch 11, p5511

<sup>2</sup> Jones, Doug, *Building and Construction Claims and Disputes* 1996, Southwood Press Pty Ltd, Sydney. p4

reasonable standards and tolerances for domestic building work, where such standards and tolerances are not articulated by the contract documents and are not prescribed in:

- the Building Act 1993
- the Building Regulations 1994
- the Building Code of Australia (BCA); and
- the Australian Standards referenced in the BCA

**NOTE:**

**Where there is any contradiction or difference between the Guide and the BCA, relevant legislation or the building contract, the BCA, legislation or building contract will take precedence (over the guidelines).**

**Guide to Standards and Tolerances – 2002**

Typically the Building Commission’s “*Guide to Standards and Tolerances – 2002*” provides some guidance for residential concrete slabs only.

The *Guide* states that if distress is rated at less than Category 3, the defect is to be monitored for a period of twelve (12) months. If at the end of the monitoring period, the distress rating is assessed as greater than Category 2, this will be considered a defect. For concrete floors, according to Table C2, where a crack width is greater than 2.0mm, this, according to the standard, is considered a defect. Of important note is the standard is restricted to “Residential” slabs and footings and is not generally consummate with commercial type structures, where a 1.5mm crack in a liquid retaining structure may not be considered acceptable.

**AS2870 – Residential slabs and footings code**

Typically specifications which are referred to in the contacts will call up Australian Standards and the Building Code of Australia. For example in Appendix C of AS2870 1996 – Residential slabs and footings code, Table C1 and C2 for gives a classification guide for damage with reference to Walls and Concrete Floors respectively.

**AS3600 – Concrete Structures Code**

Section 8.6 and Section 9.4 of the Concrete Structures Code deals with crack control for flexure in reinforced beams and slabs respectively. This provision provides a methodology where crack control in various situations is “deemed to be satisfied” where the centre to centre spacing of bars in each direction complies with a specified maximum upper limit.

One notes that no numerical upper limit is specified although it is conceivable that crack widths could be calculated, although as no guidance is given, one may assume that non-compliance with the deem to satisfy provision is a defect?

**Contract**

**ABIC MW-1 2003 Major Works Contact**

An example of a contract commonly used in both domestic and quasi-commercial building construction is the ABIC MW-1 2003 Major Works Contact” which defines the terms “defect or defective work” as:

Work that is:

- in breach of any of the warranties set out in the *\*contract documents*
- not in accordance with the standard or quality of building work specified in the *\*contract documents*.

The term *\*contract documents* is further defined under Section S as:

Any special conditions shown in **schedule 2**, the conditions of this contract, the specifications, the drawings and any other documents shown in **schedule 3**

Typically specifications which are referred to in the contracts will call up Australian Standards and the Building Code of Australia.

### **AS 2144 General Conditions of Contract**

No definition is given of what a “defect” or “defective work” is although a vigilant administrator may consider recourse to inserting the general conditions some provisions or standards defining what these terms mean.

### **Case Law**

In the High Court case of *Schuler AG v Wickman Machine Tools Sales Ltd* [1974] AC 235, the court analysed the particular subject contract and held that there were to be distinguished the warranty in respect to compliance with specification and on the other hand, against defects in material and/or workmanship.

The court considered the definition of what constituted the meaning of the two words “defects” and “faulty”. Reference was made to the Oxford Dictionary where the word defect gave the meaning as:

1. *“The fact of being wanting or falling short; lack of absence of something essential to completeness (opposed to excess); deficiency.*

2. *A shortcoming of failing; a fault, blemish, flaw, imperfection (in a person or thing).*

3. *The quality of being imperfect; defectiveness, faultiness.”*

On the other hand, “faulty” is given the primary meaning of:

*“Containing faults, blemishes or defects; defective, imperfect, unsound”*

Here the contractor relied upon the dictionary definitions in order to argue that neither “defect” nor “faulty” connoted any element of blame or failure by a person (that is, him!).

Similar authority exists in the New Zealand case of *Chalmers Leask Underwriting Agencies v Mayne Nickless Ltd* (1982) 2 ANZ Ins Case, the word ‘defective was said to:

*“..simply denote that the subject matter whether it be workmanship, design or material, is ineffective for the purposes for which it was intended. The epithet is neutral on the question whether the defective condition is or not due to negligence”*

**And who is it that determines whether a defect exists or not when there is a dispute between the principal and the contractor/sub-contractor? The Expert?**

### **The Expert**

### **Legislation**

Order 44 of the **Supreme Court (General Civil Procedure) Rules (2005)** deals with the role of the expert when presenting evidence before the Court.

Similar provisions apply for the County and Magistrates Courts as well as the Federal Courts. In particular Form 44 states the Code of Conduct the expert is to adhere to. The Rules states that a person engaged as an expert witness has an overriding duty to assist the Court impartially on matters relevant to the area of expertise of the witness and further that he/she is not an advocate for a party.

Similar rules exist by way of practice note, **PNVCAT 2 – Expert Evidence** with the *Victorian Civil & Administrative Tribunal Act 1998* where:

## **2. Expert's duty to the Tribunal**

- 2.1 An expert witness has a paramount duty to the Tribunal and not to the party retaining the expert.
- 2.2 An expert witness has an overriding duty to assist the Tribunal on matters relevant to the expert's expertise.
- 2.3 An expert witness is not an advocate for a party to a proceeding.

## **Case Law**

Of interest here was the Victorian Supreme Court case of **Gombac Group Pty Ltd v Vero Insurance Ltd & ors (2005) VSC 442**, decided on 9 November 2005 by His Honour Justice Osborn.

The facts of the case dealt with a dispute originally between the owner and the builder, where the builder installed timber flooring in an apartment of which the owner subsequently purchased. Soon after purchasing the apartment the owner noticed that not only were there

cracking between the joints but also along the ends of the boards.

The Owner duly lodged a claim with its warranty insurer, Vero. After initially rejecting the claim, Vero, accepted the claim, where subsequently, the builder appealed the decision of the insurer.

At the Tribunal, both the insurer's and the builder's experts gave evidence. The Tribunal found that the evidence presented by both experts was unsatisfactory and concluded in respect to the experts opinions that:

*“Whilst purporting to have prepared their reports in accordance with VCAT Practice Note 2 it was apparent that neither expert had any real understanding or appreciation of his obligations under the Practice Note.”*

In discussing the evidence of one of the experts, the Deputy President stated that:

*“His attitude in relation to the Australian Standard, which he clearly does not agree with, was not helpful and did nothing to persuade me I should rely on his evidence. He clearly relied on information provided to him by the builder in reaching the unsupported conclusions as set out in the following two paragraphs of his report...”*

Of note was that the evidence of the other expert was found also to be *“similarly unreliable.”*

Reliance by the Tribunal was ultimately placed on the 1999 *Guides to Standards and Tolerances* (as it was known then) issued by the Building Control Commission where the Deputy President commented that she was:

*“...satisfied on the balance of probabilities that the defects in this floor are due to the poor workmanship of the builder, particularly in the absence of any warning by the builder to or acknowledgement by the developer as contemplated by clause 10.1 of the Guidelines to Standards and Tolerances.*

Of significance in this case was the rejection by the Deputy President of both of the experts evidence and making its own determination.

This was appealed to the Supreme Court where the central question for the court to consider was whether the Tribunal erred in law in rejecting the evidence of both timber experts when their evidence was said to be consistent and plausible and not contradicted.

His Honour Justice Osborn’s decision concluded, drawing on Justice Winneke P, dicta in *Transport Industries Insurance Co Ltd v Longmuir* [1997] 1 VR 125 stated that:

*“It is a fundamental duty of a tribunal to address the question of a particular fact in issue in proceedings before it by reference to the whole of the evidence relevant to that issue and not some part of that evidence alone. It must not deny itself the full benefit of the evidentiary impact of the combined weight of all the intermediary facts. Where a case turns on circumstantial evidence it will be open to the Tribunal to use some facts as tending to support conclusions with respect to other facts although they may not in themselves be directly probative of the matter in issue. In a civil case the Tribunal must ultimately conclude whether*

*relevant inferences are more probable than not on the basis of all the circumstantial evidence before it.*

Ultimately Justice Osborn stated that it would be open to the Tribunal, on the evidence before it to conclude in all the circumstances and not just the facts presented before it, that it must ultimately decide what is relevant and what is not and what would be more probable with all the evidence before it. So reference to the Building Commissions Guidelines by the Tribunal in itself did not constitute an error in law.

## **Reasonableness**

### **Reasonable cost of rectification**

Where it is established that a defect does in fact exist it is up to the court to decide what is reasonable in the circumstances.

In the High Court case of *Bellgrove v Eldridge* [1954] the builder and the owner entered into a contract in 1949 for the builder to construct a house for the sum of 3,500 pounds. By the time of the proceeding, progress payments totalling 3,100 pounds had been made. The builder claimed to recover the balance of 400 pounds. That claim was denied by the owner who cross-claimed for damages in respect of substantial departures from the building specifications which, it was alleged, made the structure of the house unstable.

The evidence established, to the satisfaction of the trial judge that there had been substantial departure from the specifications as to concrete and mortar. It was further established that the house was gravely unstable as a result of such departure.

The trial judge concluded that the defects were such that the only satisfactory

method of assuring stability was to demolish the house and rebuild it and assessed damages at a sum representing the cost of demolishing and re-erecting the house in accordance with the plans and specifications, together with certain consequential losses, less the demolition value of the house and moneys unpaid under the contract. This decision was upheld by the High Court.

The High Court reaffirmed that **the general rule was that the measure of damages was the difference between the contract price of the work contracted for and the cost of making the work conform to the contract, with the addition of any appropriate consequential damages. It further held that the general rule was subject to the qualification (the second limb) that the undertaking of the work necessary to produce conformity must be a reasonable course to adopt.** In their joined judgement Dixon CJ, Webb and Taylor JJ, inter alia, stated that:

*“In the present case, the respondent was entitled to have a building erected upon her land in accordance with the contract and the plans and specifications which formed part of it...This loss cannot be measured by comparing the value of the building which has been erected with the value it would have borne if erected in accordance with the contract; her loss can, prima facie be measured only by ascertaining the amount required to rectify the defects complained of and so give her the equivalent of a building on her land which is substantially in accordance with the contract.”*

Their Honour then gave an example of a room in a house being finished in a colour other than that specified. The house is no less valuable on account of

the variation from the specifications, but nonetheless the owner is entitled to the cost of rectification. On this basis the diminution in value argument was rejected, in favour of quantum based on rebuilding. **Their Honours held that the usual measure of damages in building cases was the work necessary to remedy defects in a building and so produce conformity with the plans and specifications:**

*“As to what remedial work is both “necessary” and “reasonable” in any particular case is a question of fact. But the question whether demolition and re-erection is a reasonable method of remedying defects does not arise when defective foundations seriously threaten the stability of a house and when the threat can be removed only by such a course. That work, in such circumstances, is obviously reasonable and in our opinion, may be undertaken at the expense of the builder. As we have already said...the question which arises in this case is...whether demolition and rebuilding is the only **practicable** method of dealing with the situation that has arisen. The learned trial judge thought it was and after hearing and considering the arguments on this appeal we agree with him.”*

The fact that Australian courts look at the reasonableness of rectification in assessing whether diminution in value or rectification is warranted will not always have the effect it had in *Bellgrove v Eldridge*. In *Jandon Constructions v Lyons* (1999) 16 BCL 309 footing defects were considered such that anything short of demolition and rebuilding would be a “doubtful remedy”. It appears that the court agreed that the question before it was whether the demolition and re-erection of the dwelling house was a

reasonable and appropriate remedy for the defects in question but split on applying this test to the facts, with the majority holding demolition and re-erection was reasonable.

In *D Galambos & Son Pty Ltd (1974) 5 ACTR 10 at 11* Justice Woodward stated the position as follows:

*“Where it would be reasonable to perform remedial work in order to mend defects or otherwise to produce conformity with the plans and specifications which were part of the contract, the measure of damages is the **fair cost of that remedial work.** Where the defect is such that repair work would not be a reasonable method of dealing with a situation (usually because the cost of such work would be out of proportion to the nature of the defect), then the measure of damages is any diminution in value of the structure produced by the departure from plans and specifications or by defective workmanship.”*

His Honour also gave damages to compensate for a diminution in the enjoyment of the house because of work done not in accordance with the plans, which did not result in any loss in the value of the building but which prevented the building owner from using part of it as he had intended.

### **Application of the Rule**

The measure of the damages recoverable by the building owner for breach of a building contract is prima facie the difference between the contract price of the work and the cost of making the work conform to the contract.

The rule in *Bellgrove v Eldridge* is important because it articulates the

quantum of damages that the Applicants in a case in similar circumstances are likely to be awarded.

The first limb of the rule is that the measure of damages is the difference between the contract price of the work contracted for and the cost of making the work conform to the contract, with the addition of any appropriate consequential damages.

However, the qualification to which this rule is subject to is that, not only must the work undertaken be **necessary** to produce conformity, but that also, it must be a **reasonable** course to adopt (“the second limb of the rule”).

Therefore, any rectification work suggested by the Expert Witness to be carried out should be “necessary” to “produce conformity”.

The critical question is whether it will be a **“reasonable”** course to adopt.

In *Bellgrove v Eldridge* the High Court judges said that:

*“...a building owner has a right to demolish a structure which, though satisfactory as a structure of a particular type, is quite different in character from that called for by the contract”.*

However, whether a method is reasonable and whether is the only practicable method of dealing in this situation is a question of fact.

If that was the case then the true measure of the Applicants’ loss would be the diminution in value, **if any**, produced by the departure from the plans and specifications or by the defective workmanship or materials.

## **In Summary**

As stated above as to what remedial work is both “necessary” and “reasonable” in any particular case is a question of fact. It will always be difficult to predict how the Courts will consider the facts in any particular situation but will view favourably the methodology that is “reasonable and practicable in the circumstances”

## **About the Author**

Angelo Simonetto, prior to practising construction law was a Civil & Structural Engineer for over 20 years, so he understands the plight of the engineer and the designer. Angelo Simonetto’s email address is [angelos@lovegrovesolicitors.com](mailto:angelos@lovegrovesolicitors.com)

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