

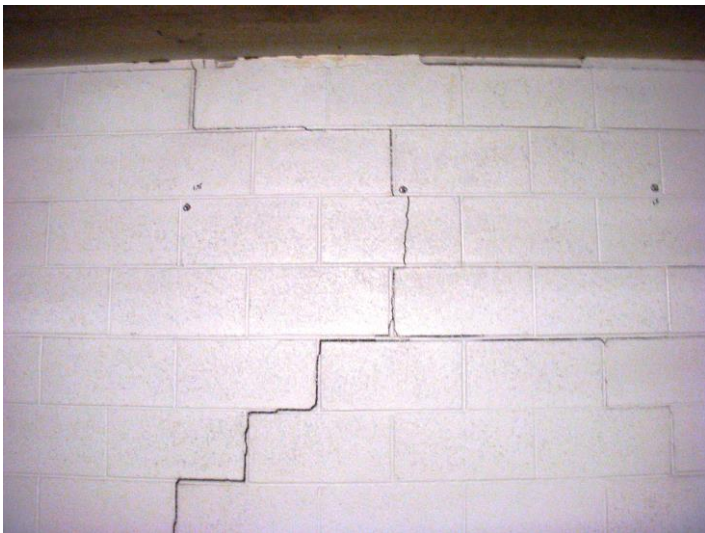


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## Cracking of Building Elements

(Informative) as described in Australian Standard AS 4349.1-2007



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### E1 GENERAL

Use of cracking of building elements as an indicator of structural performance can be problematic. Where cracking is present in a building element the inspector has to be alert to the possibility that the cracking may be the result of one or more of a range of factors and that the significance of the cracking may vary (see paragraph E2)

## E2 TYPES OF CRACKING DEFECT'S

### E2.1 Determining a defect

Cracking in a building element may constitute a defect in a variety of ways. In many cases a particular cracking occurrence may result in more than one type of defect, a serviceability defect and an appearance defect.

The inspector should determine whether the cracking constitutes a major or minor defect, based on the expected impact of the cracking.

### E2.2 Appearance defect

Cracking of a building element is an appearance defect where in the opinion of the inspector the only present or expected consequence of the cracking is that the appearance of the element is blemished.

### E2.3 Serviceability defect

Cracking of a building element is a serviceability defect where the opinion of the inspector the present or expected consequence of the cracking is that the function of the building element is impaired.

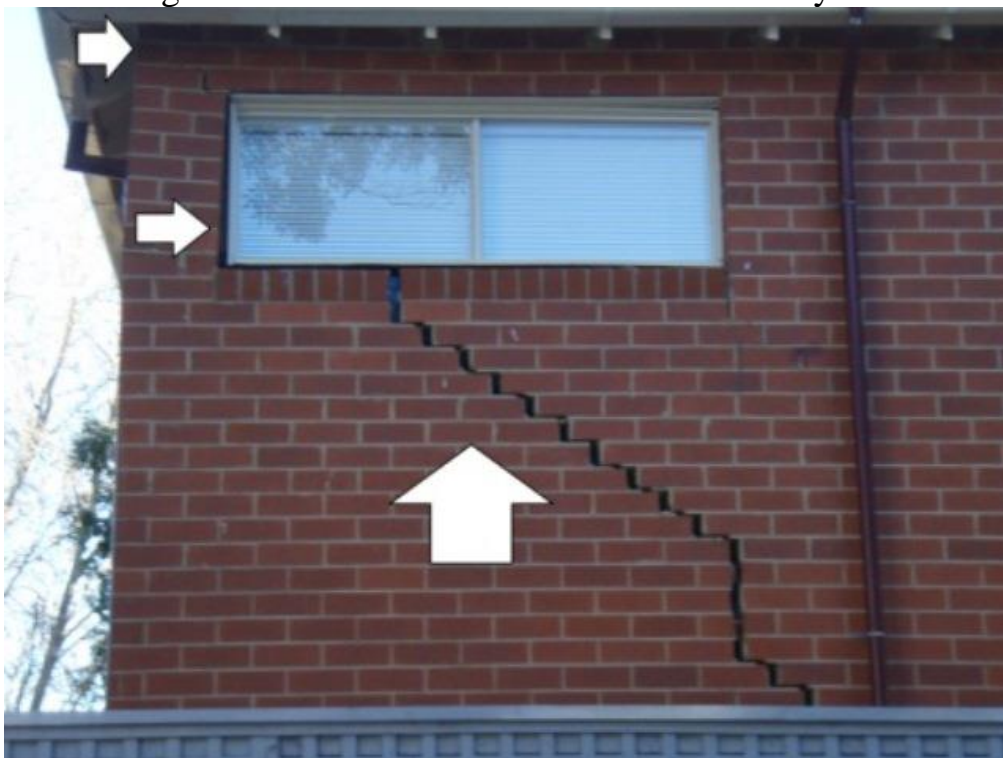
Examples of serviceability defects resulting from cracking are as follows:

- (a) Windows or doors not opening and closing properly
- (b) Water leakage occurring through a building element, which otherwise should not allow water entry.

### E2.4 Structural defect

Cracking of a building element is a structural defect where in the opinion of the inspector the present or expected consequence of the cracking is that the structural performance of the building element is impaired, or where the cracking is the result of the structural behaviour of the building.

The criteria for determining whether cracking is a structural defect are not solely related to crack width. Cracks 0.1 mm wide may be a structural defect while cracks 5.0 mm wide may not be structural defects. Cracking in a structural element does not necessarily indicate a structural defect.



## E3 CATEGORIZATION OF CRACK IN MASONRY WALLS

Reporting of cracking in masonry walls should be in accordance with Table E1

**Table E1**                      **CATEGORISATION OF CRACKING IN MASONRY**

<b>Description of typical damage and required repair</b>	<b>Width limit</b>	<b>Damage Category</b>
Hairline cracks	<0.1mm	0
Fine cracks that do not need repair	<1.0mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly	<5.0mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Door and windows stick service pipes can fracture. Weather-tightness often impaired.	>5.0mm, <15.0mm (or a number of cracks 3.0mm or more in one group)	3
Extensive repair work involving breaking out and replacing sections of walls, especially over doors and windows. Doorframes distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted.	>15.0mm, <25mm but also depends on number of cracks	4

# Types and examples of defects

(informative) as described in Australian Standard AS 4349.1

**Table F1 provides information on defects subsets and some examples of each type of defect**

type	Defect	Examples of subsets	Examples of defects
A	Damage	Integrity of the element compromised to the extent that collapse has occurred or is imminent. Damage to the extent that the element is unserviceable or may become so soon. Circumstances where the consequential damage is out of proportion to the initial factor.	Cracked power point in a wet area. Brick wall damaged to the extent that stability is impeded. Damaged support to a ceiling such that collapse is possible
B	Distortion, warping, twisting	Distortion to the extent that the element is unserviceable or may become so soon. The ability of the property to resist weather has been compromised (eg., wind). Integrity of the element compromised to the extent that collapse has occurred or is imminent.	Sagging roof to the extent that allows ingress of vermin or rain. Distortion reduces support for structural members. Cavity wall has distorted due to the failure of ties; retaining wall rotated. Deflection of a lintel to such an extent that joinery is jammed; footings sunk. Deflection of elements consistent with significant settlement of footings
C	Water penetration-damp related	Water penetration to the extent that the element is unserviceable or may become so soon. Moisture present to the extent that conditions are conducive to structural deterioration or unhealthy environment.	Leaking shower recess. Leaking roof flashings causing water penetration into the building. Slab edge dampness; rising damp causing salt attack
D	Material deterioration (rusting, rotting, corrosion, decay)	Material deterioration to the extent that the element is unserviceable or may become so soon. Integrity of the element compromised to the extent that collapse has occurred or is imminent. Material deterioration to the extent that conditions are conducive to structural deterioration or unhealthy environment.	Concrete cancer. Rusting of structural connections and members such that the strength of the member has been reduced. Severe delignification such that the strength of the member has been reduced. Decay in timber members. Generalised spalling of brickwork indicating poor material
E	Operational	Operational deterioration to the extent that the element is unserviceable or may become so soon. Operational deterioration to the extent that conditions are conducive to structural deterioration or unhealthy or unsafe environment.	Water hammer. Water supply inadequate.
F	Installation (including omissions)	Installation deficiencies to the extent that the element is unserviceable or may soon become so. Installation deficiencies to the extent that conditions are conducive to structural deterioration or unhealthy or unsafe environment.	Absence of bracing in houses supported by poles. Meter boxes missing; handrails not properly connected on a balustrade. Tie-downs and structural connections missing. Fire-rated party walls missing where required. Missing ant caps.

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