

Amendments to Two Proposals

Introduction¹

In April 2011 the Board considered the *Slips, Trips and Falls* final decision RIS and decided to list three of the five proposals in the forthcoming 2012 National Construction Code (NCC) Public Comment Draft.² The three proposals were:

- **Handrails:** to be required for all private stairways
 - NPV of \$65m; recommended in the final decision RIS
- **Openable Window Barriers:** require a one-metre sill height barrier, or limit the window opening, or install a screen
 - NPV around zero; not recommended in the final decision RIS
- **Non-climbable Balustrades:** required for balustrades where the floor is more than one metre above the ground (no climbable or horizontal elements)
 - NPV of -\$95m; not recommended in the final decision RIS

The Board agreed to publish the final decision RIS on the ABCB website for the information of stakeholders.

The Board also asked the ABCB Office to convene a forum of stakeholders who had commented on these proposals, either on the 2012 NCC Public Comment Draft or on the consultation RIS. The ABCB Office convened the stakeholder forum in August: comprising childhood injury prevention groups, sectors of the windows, balustrades and building industries and some officials from the Commonwealth, State and Territory Governments. The outcomes of the stakeholder forum were:

- **Handrails:** unanimous support. Working group of ABCB / industry to be established to refine some details (e.g. at what point along a stairway can there be a break in the handrail).
- **Openable Window Barriers:** agreement that the proposed one-metre sill height would be ineffective; an opening limited to 125mm would be an effective barrier, through lockable devices attached to windows, for example, which would be possible for the windows industry to supply. Strong support

¹ The ABCB acknowledges with appreciation a peer review of this Addendum undertaken by Aurecon.

² This is a consultation document issued in June each year, containing amendments proposed for the NCC to be implemented in May of the following year. An eight week consultation period allows the building industry and other stakeholders to comment, usually about the technical efficacy of the proposed amendments. The comments and amendments are assessed by the Building Codes Committee, a technical advisory group to the ABCB, which makes specific recommendations for the Board in relation to each proposed amendment. The Board makes a decision on the amendments in December each year. Hence a listing on the Public Comment Draft, while not definitive, does indicate an intention of the Board.

for this suggestion from childhood injury prevention groups; industry later objected to the proposed removal of the 865mm sill height option. Working group of ABCB / industry / childhood injury groups to be established to develop this suggestion in detail.

- Non-climbable Balustrades: strong support from childhood injury prevention groups, strenuous opposition from industry. Both parties had met prior to the forum to explore innovations in conventional balustrades (with horizontal elements) that included additional elements to impede climbing, for example an inwardly kinked top rail. Working group of industry / childhood injury prevention groups to continue and explore innovative possibilities.

The discussion of the openable window barriers and non-climbable balustrades proposals also canvassed a minimum height of two metres that would align better with other provisions in the NCC.

The Board considered these outcomes in September 2011. It agreed to implement the Handrails proposal from May 2012. The Board decided to support the stakeholder suggestions for openable window barriers and non-climbable balustrades, to come into effect in May 2013 to allow time for the ABCB Office to work with industry to refine some details of the proposals and for industry to prepare for the changes.

The Amended Proposals

1. Openable Window Barriers

The final decision RIS presented a proposal, “barrier for openable windows”, which required a one metre barrier where the distance from floor level to the surface below is greater than one metre and less than four metres.

The Board decided that a barrier would not be required on openable windows where the distance from floor level to the surface below is less than two metres. Openable windows above this distance would be required to maintain a barrier. The proposed one metre minimum height of the window sill was discontinued, on the basis that it would not be an effective barrier, and the following barriers were added:

- a window opening of less than 125mm, achieved through a fixed or lockable device; or
- a screen of sufficient strength.

These changes were discussed and endorsed by a majority of stakeholders at a forum held in August 2011. Where a lockable or removable device or screen is used, the current BCA provision of an 865mm minimum sill height would however still apply in case the device or screen is inadvertently unlocked or removed.

This proposal would be implemented in NCC 2013.

2. *Non-climbable Balustrades*

The final decision RIS presented a proposal “non-climbable zone” which required all balustrades between one and four metres from floor level to the surface below, to include a non-climbable zone: no horizontal elements between 150mm and 760mm of the balustrade.

The Board decided that the non-climbable zone:

- would not be required for balustrades with a floor to ground distance of up to two metres;
- would be required for balustrades with a floor to ground distance of between two and four metres, while allowing innovation of balustrades with some horizontal elements that include a provision to impede climbing by children, such as an inwardly kinked top rail; and
- would continue to be required for balustrades with a floor to ground distance over four metres.

A proposal for an inwardly kinked top rail for balustrades was discussed at the Stakeholders’ Forum in August, with interest from childhood injury prevention groups and industry.

This proposal would be implemented in NCC 2013.

Costs of the Amended Proposals

1. *Openable Window Barriers*

In the final decision RIS the one metre barrier was considered capable of being addressed in the design stage, with no impact on construction costs. The amendment as indicated above will add \$30 million to construction costs (present value over ten years) with the barriers sourced from window locks (80%) and screens (20%).

The costing of additional locks and screens takes into account current practice of builders to already include locks or restrictions on openable windows for many dwellings. The proportion is higher for new apartments than for new houses. Note that some windows will be non-openable or open onto balconies.

Table 1 – Cost of locks and / or screens for openable windows^(a)

		Parameter
Houses^(b)	103,200	
Two or more storey houses ^(c)	20,640	20%
Windows	123,840	6
Windows not locked or screened ^(d)	61,920	50%
Unit cost of locks ^(e)		\$30
Unit cost of screens ^(f)		\$130
Cost of window locks	\$1,486,080	80%
Cost of window screens	\$1,609,920	20%
Total cost for houses	\$3,096,000	

Apartments^(b)	44,600	
Windows	89,200	2
Windows not locked or screened ^(d)	17,840	20%
Unit cost of locks ^(e)		\$30
Unit cost of screens ^(f)		\$130
Cost of window locks	\$428,160	80%
Cost of window screens	\$463,840	20%
Total cost for apartments	\$892,000	
New Houses and Apartments - total cost p.a.	\$3,988,000	
PV Costs - 10 years	\$29,970,746	

- (a) Windows above 2 metres.
- (b) Source ABS 8752.0 *Building Activity, Australia*: annual average completions for the five years to March 2011, original data.
- (c) Proportion of two or more storey houses to total houses extrapolated from the Victorian Building Commission data.
- (d) A proportion of new dwellings are currently built with locks on openable windows.
- (e) Prices for window locks range from \$20 - \$70, so minimum effective regulation would require products at the lower end of the scale.
- (f) Prices of suitably strong screens begin at \$130 per m², hence a screen for a 1 m² openable window would be \$130 (larger windows would probably be locked).

2. Non-climbable Balustrades

In the final decision RIS, the non-climbable zone requirement was modelled as the effect of shifting horizontal balustrade wires to become vertical balustrade wires. This shift meant that the balustrades had to become much more sturdy and hence much more expensive. The ABCB office estimated the impact to increase construction costs by \$101 million (present value over ten years); on industry data the increase in construction costs would be \$242 million (present value over ten years).

The amended proposal, as indicated above, would not require a non-climbable zone on balustrades with a floor to ground distance of up to two metres. Balustrades in this category are typically on the ground floor of a house where the ground outside the balcony is sloping downhill. On the assumption that 10% of new houses with balconies could be so described, the costs reported in the Final Decision RIS could be adjusted to \$91 million (ABCB) and \$218 million (industry).

The amended proposal also requires a non-climbable zone for balustrades where the distance from floor to ground is between two and four meters. The adjusted costs, of \$91 million and \$218 million, could apply as one scenario. An alternative scenario for the amended proposal would recognise innovation, where a balustrade with some horizontal elements also contained a non-climbable element to impede children climbing, such as an inwardly kinked top rail. Under the alternative example, the additional costs could be small: just the cost of fabricating balustrade posts with a kink at the top. This element will generally apply only to new houses; new apartment blocks which typically rise many storeys will have non-climbable balustrades. The cost of this example is estimated at \$3 million (present value over

ten years). Other examples under this alternative scenario may exhibit higher costs if the innovation is more elaborate.

Table 2 – Cost of the example: fabricating a “kink” feature on balustrade posts

		Parameter
Houses ^{(a), (b)}	103,200	
Two or more storey houses ^(c)	20,640	20%
Balustrades ^(d)	20,640	
Balustrades – wire	6,811	33%
Posts per balustrade (average)		10
Posts - cost per post		\$30
Posts - additional fabrication cost	\$408,672	20%
PV cost - 10 years	\$3,071,265	

- (a) Source ABS 8752.0 *Building Activity, Australia*: annual average completions for the five years to March 2011, original data.
- (b) Only new houses will be affected by the balustrade proposal; new apartments are excluded because balustrades on every story will be uniformly non-climbable.
- (c) Proportion of two or more storey houses to total houses extrapolated from the Victorian Building Commission data.
- (d) Each new two or more storey new house will contain a balcony (on average).

This example was discussed at the August Stakeholders Forum with interest from childhood injury prevention groups and industry. It was canvassed as an idea, one approach suggested by industry to meet the concerns of childhood injury prevention groups. This example is yet to be market tested. Its safety feature – impeding falls of children – could appeal to families moving into a new home. What this illustrates is that innovation by industry can reduce the cost impact of the proposal very significantly, and contribute to a very worthwhile public safety goal.

Benefits of the Amended Proposals

The benefits methodology followed in this addendum is the same methodology used in the final decision RIS.

1. *Openable Window Barriers*

In the final decision RIS the benefits of a one metre window barrier were estimated at \$3.8 million (present value over ten years³). This figure represents the benefits of injuries and fatalities avoided by an appropriate barrier to reduce the incidence of children falling from openable windows. Information from one stakeholder suggested a higher incidence of children’s falls, and hence greater scope to reduce injuries and fatalities, with the benefits calculated by the ABCB Office to be \$4.4 million (present value over ten years).

³ Incorporating a 30 year physical depreciation period for dwellings, over which time the benefits of the proposal will accrue.

The amended proposal will largely prevent children falling from openable windows because all window openings will be restricted to less than 125mm, or a suitable screen is installed. The effectiveness rate, allowing for behaviours such as adults forgetting to lock openable windows, would be around 90%. This contrasts with an effectiveness rate of 30% for the one metre proposal in the final decision RIS, which was based on a slips, trips, falls benchmark. Increasing the effectiveness rate from 30% to 90% increases the calculated benefits to \$11 million (ABCB Office) and \$13 million (stakeholder).

Table 3 – Benefits of barriers for openable windows^(a)

	ABCB Office (\$m)	Stakeholder (\$m)
Final Decision RIS Proposal	3.8	4.4
Amended Proposal	11.4	13.1

(a) Present value over 10 years

While the improvements of the amended proposal deliver higher calculated benefits, it should also be recognised that these improvements substantially enhance the welfare of children and also may affect their adult lives.

2. Non-climbable Balustrades

In the final decision RIS the benefits of introducing a non-climbable zone on all balustrades between one and four metres were estimated at \$3.6 million (present value over ten years⁴). This figure represents the benefits of injuries and fatalities avoided by reduction in the incidence of children’s falls after climbing balustrades. Information from one stakeholder suggested a higher incidence of children’s falls, and hence with greater scope to reduce injuries and fatalities, the benefits calculated by the ABCB Office are \$5.7 million (present value over ten years).

The proposal in the final decision RIS assumed an effectiveness rate of 30%, based on a slips, trips, falls benchmark and also taking account of behaviours such as the placement of furniture next to balustrades and the supervision of children. These behaviours will continue to be a risk factor and hence there is no reason to increase the benefits as estimated in the final decision RIS, at \$3.6 million (ABCB Office) and \$5.7 million (stakeholder). The amended proposal would not apply to ground floor balustrades and, consistent with the adjustment to costs, its benefits should be reduced by 10%: to \$3.2 million (ABCB) and \$5.1 million (stakeholder).

⁴ Incorporating a 30 year physical depreciation period for dwellings, over which time the benefits of the proposal will accrue.

Evaluation of the Costs and Benefits

The costs and benefits of the two proposals in the final decision RIS, and as amended, are presented in the Table 4, below.

The Openable Window Barriers proposal was a small net benefit under the final decision RIS and becomes a net cost under the amended proposal, where the costs of locks and / or screens to a degree exceed the estimated benefits. While a net cost, the amended proposal means that children will be prevented from falling from openable windows in new dwellings. This is a significant outcome.

The Non-climbable Balustrades proposal was a high net cost under the final decision RIS. Under the proposed amendment a high net cost remains a possibility. However it is also possible for industry to innovate and by so doing deliver a small net benefit overall. An innovative example has already been suggested by industry, and while yet to be market-tested, the financial rewards of innovative approaches such as this are compelling.

The net present values of the proposals are presented in the following table.

Table 4 – Net present values of the proposals

	Final Decision RIS Proposals	Amended Proposals^(a)
	(\$m)	(\$m)
Openable Windows barrier		
Costs ^(b)	0.0	30.0
Benefits ^(c)	4.4	13.1
Net Present Value	4.4	-16.8
Non-climbable Balustrades		
Costs ^(b)	101.1	3.1
Benefits ^(c)	5.7	5.1
Net Present Value	-95.4	2.0

(a) As described in the section “The Amended Proposals”, above.

(b) ABCB Office costings

(c) Stakeholder based estimates