REPORT ON THE COST IMPLICATIONS OF PROPOSALS TO AMEND THE D-T-S PROVISIONS OF SPRINKLER PROTECTION TO COVERED BALCONIES

COST IMPLICATIONS STUDY

20 NOVEMBER 2015

RLB Rider Levett Bucknall

Table of Contents

Rider Levett Bucknall NSW Pty Ltd

ABN 94 003 234 026

Level 19, 141 Walker Street

North Sydney NSW 2060

REPORTS ISSUED

REPORT	DATE	TITLE DESCRIPTION	RELEASED BY
1	09.11.15	Draft Report	Stephen Ballesty
2	20.11.15	Final Report	Stephen Ballesty

Rider Levett Bucknall QA	Prepared by:	Reviewed by:	Released by:
Name:	Scott Walker	Stephen Ballesty	Stephen Ballesty

1.0 Introduction

This report provides commentary on the cost implications of a proposed Deemed to Satisfy (D-t-S) provision for the requirement of covered balconies to be sprinkler protected.

This report has been prepared for the Australian Building Codes Board (ABCB) by Rider Levett Bucknall (RLB) in order to prepare a cost analysis reflecting the capital cost implications of amending the National Construction Code (NCC) to include provisions that require all covered balconies to be sprinkler protected in all new Class 2, 3, 9a and 9c buildings.

RLB accepts neither responsibility nor liability to any other party who might use or rely upon this report without our prior knowledge and written consent.

1.1 Major Assumptions

This report of cost implications is based on a number of assumptions, as per Section 2.4 further within this report.

The following assumptions are of particular note:

a) Capital cost estimates are based on new construction.

b) All installations are to be installed as part of main construction programme and not as isolated tasks.

c) Please refer to Section 4.0 of this report, the Glossary of Terms, for definitions of abbreviations used herein.

1.2 Cost Implications Summary

The following costs are shown for the provisions being carried out across all nominated building classes.

Class	Property Type	Sprinkler Installation Materials $	Additional Pump Requirement $	Additional Labour Cost $	Total Cost Across Property Type
2	Residential Apartments	39,000	-	9,000	$ 48,000
3	10 Storey Hotel	50,000	-	18,000	$ 68,000
9a	Hospital Building	-	-	-	$ -
9c	Aged Care Facility	37,000	8,500	10,000	$ 55,500

Refer to Appendix A for a detailed analysis of the proposal for each building class.

2.0 Basis of Report

2.1 Purpose and Status

This report has been prepared to estimate the capital cost implications associated with amendments to the D-t-S provision of the National Construction Code Series Building Code of Australia (BCA) 2015 referring to the provision of sprinklers to covered balconies currently exempt from this requirement. Our cost estimates have been based on RLB benchmarked cost information for the nominated building classes.

2.2 Methodology

Our approach to this exercise is to use our industry knowledge and experience to provide an analysis of the cost implications of the proposal using typical examples of the nominated building classes as a basis of reporting. Our cost models provide the ABCB with the information to review a summary of the cost implications either by per unit of the nominated building classes or by overall building cost increase across all nominated building classes. The following methodology outlines the works we carried out to complete this analysis:

a) Initial reviews were undertaken of the nominated building classes and typical examples found of each building class in the RLB database. Upon completion these examples were used as a basis to prepare overall construction cost estimates for each of the nominated building classes. All estimates prepared by RLB contain rates as at June 2015 based on a Sydney datum which can then be applied to other major locations.

b) A review was undertaken of the current BCA requirements that enabled us to provide a baseline for our reporting.

c) Upon review of the current BCA requirements regarding sprinkler installations as noted in Section E.1 and Specification E1.5 of Volume One NCC 2015 and Australian Standard AS2118.1 - 2006, RLB identified within each of the nominated building classes the installation requirements to be included in this report. This allowed RLB to formulate a schedule of the works required for each of the building classes.

d) Upon identification of the areas requiring sprinkler protection and the formulation of the schedule of works, RLB estimated the quantity of sprinkler heads and associated pipework and fittings to be provided, and commented on the cost implications associated with the additional installation.

e) In addition to providing estimates of the works involved in the above proposal, we have also provided commentary, where applicable, on the proportional increase on a per building and per unit basis for each of the nominated building classes.

2.3 Information Used

a) The following Australian Standards have been used for reference in the compiling of this report:

- AS 2118.1 - 2006
- AS 2941 - 2013
- AS 2419.1 - 2005

b) The costs in this report are based upon rates applied to measured elemental quantities and are current as at June 2015.

c) Existing scope of works and required building standards have been taken from National Construction Code Series 2015 Volume 1 – Building Code of Australia Class 2 to Class 9 Buildings.

2.4 Assumptions Specific to Building Classes

We have employed the following assumptions regarding the nominated building classes in preparing this report:

2.4.1 Class 2 – Residential Apartments

a) The accommodation is based on a residential block with a mix of 1, 2 and 3 bedroom units included.

b) The accommodation block comprises of 37 units over 7 storeys.

c) Four of the apartments are located on the ground floor and do not have areas included in this study.

d) Seven of the apartments are penthouse apartments and have balconies with an area exceeding 6m^2 and a depth exceeding 2m and would already have a requirement for a sprinkler installation.

e) The average size of balcony for each apartment included in this study is 3m long x 1.8m deep.

f) Water is drawn from the town mains supply with a requirement for booster pumps to be installed. The booster pump system comprises of one compression engine driven pump and one electric motor driven pump. The supplemental sprinklers to this property will not require an upgrade to the booster pump system.

2.4.2 Class 3 – 10 Storey Hotel

a) The accommodation is based on a hotel with approximately 80 rooms over 10 storeys.

b) 40 rooms have small balconies of 2m long x 1.5m deep. 14 rooms are of higher specification and have larger balconies of 3.6m long x 1.8m deep. The remaining rooms do not have balconies.

c) Water is drawn from the town mains supply with a requirement for booster pumps to be installed. The booster pump system comprises of one compression engine driven pump and one electric motor driven pump. The supplemental sprinklers to this property will not require an upgrade to the booster pump system

2.4.3 Class 9a – Hospital Building

a) The hospital is based on a medium sized local hospital building with an area of approximately 5,000m^2 GFA with 60 beds over 3 storeys.

b) Water is drawn from the town mains supply which is capable of providing water at the maximum flow rate of the system.

c) We have reviewed the Class 9a buildings in our database and have concluded that this class of building would normally not have rooms with balconies currently exempt from the BCA requirement. We have found that this class of building would normally provide a common area for patrons and this common area would regularly exceed 6m^2 floor area and have a depth in excess of 2m, falling under AS 2118.1 - 2006 and already have a requirement for a sprinkler installation. We therefore conclude that there would be no additional sprinklers required for this class of building.

2.4.4 Class 9c – Aged Care Facility

a) This building is based on an 11 storey single building residential aged care facility with 3 floors of private rooms with en-suite and private balconies.

b) It is assumed that there are 10 rooms on each floor and that the average balcony size is 2.8m long x 1.8m deep.

c) Water is drawn from the town mains supply and held in a storage tank on site with a requirement for booster pumps to be installed. The booster pump system comprises of two compression engine driven pumps and one electric motor driven pump. We have concluded that additional capacity pumps would be required due to the supplemental sprinklers added to the installation.

2.5 Inclusions

The estimate includes the following allowances:

a) Design and management fees

b) Preliminaries

2.6 Exclusions

In compiling this report on Cost Implications, no allowance has been made for the following cost items:

a) Land and legal costs.

b) Fees and charges levied by local government for Development Plan applications, Development Approval, Construction Certification and the like.

c) Any costs and fees as a result of any development approval resubmissions.

d) Any special or additional contributions sought by authorities for public or other facilities as a condition of development approval.

e) Public utilities' charges, contributions and levies.

f) Environmental impact study costs.

g) Plan First fee.

h) Transport Infrastructure levies.

i) Long Service Leave levies.

j) Affordable Housing contributions.

k) Removal of asbestos and other hazardous materials.

l) Staging/phasing costs.

m) Work outside site boundaries.

n) Diverting existing services.

o) Sub-station contribution.

p) Contingencies.

q) Escalation beyond November 2015.

r) Variances to the working week of 38 hours per week.

s) 2015 Disability Access Action Plan under the National Disability Strategy.

t) Finance costs and interest charges.

u) Goods and Services Tax.

v) Promotion/Marketing costs.

w) Locational Adjustments.

x) Life cycle implications on building components and systems.

y) Ongoing operational maintenance costs.

3.0 Cost Implications of Proposed Changes

Details of the cost implications of the work contained in the proposal are shown in Appendix A.

The amendment to the D-t-S Provisions of BCA 2015 can be summarised in the following proposal. Specific assumptions for the proposal are detailed below.

3.1 Proposal - the installation of sprinkler services to covered balcony areas that do not exceed 6m^2 in area and 2m in depth

RLB have analysed the effect this proposal has on the materials required for the sprinkler installation, the effect the additional load has on the equipment required to feed the system and also the additional time and associated labour costs to complete the additional works for each of the nominated building classes.

The following assumptions have been included for this proposal:

a) The sprinkler system installed in all building class examples has been installed to AS 2118.1 – 2006.

b) The installation of the supplemental system is carried out concurrently with the sprinkler installation for the whole building. Costs are not included for works carried out independently of the main installation.

c) All adjustments to the BOWS and fire detection system are included in the labour element of this analysis, where applicable.

3.2 Analysis of Effects on Building Costs

With the implementation of these proposals, consideration should be given to the effects on the overall construction costs on a per building and a per unit basis. The following costs detail the effects of the increase in the area serviced by the sprinkler installation for each nominated building class.

Sprinkler Installation to Balconies	Residential Apartments	10 Storey Hotel	Hospital Building	Aged Care Facility
	2	3	9a	9c
	$	$	$	$
Additional Sprinkler Cost	48,000	68,000	-	55,500
Original Sprinkler installation Cost	380,000	700,000	-	680,000
Proportional % increase of Overall Sprinkler Cost	12.63%	9.71%	0.00%	8.16%
Original Sprinkler Cost Per Unit	15,000	13,000	-	23,000
Additional Sprinkler Cost Per Unit	2,000	3,000	-	2,000
Proportional % increase of Sprinkler Cost Per Unit	13.33%	23.08%	0.00%	8.70%

The effect on the Class 2 residential apartments analysed by RLB is the overall building sprinkler installation increases by approximately 12.6%. When the individual unit is analysed this increase is approximately 13.3%.

The effect on the Class 3 hotel analysed by RLB is the overall building sprinkler installation increases by approximately 9.7%. When the individual unit is analysed this increase is approximately 23%.

The effect on the Class 9c aged care facility analysed by RLB is the overall building sprinkler installation is approximately 8.2%. When the individual unit is analysed this increase is approximately 8.7%.

4.0 Glossary of Terms

ABCB	Australian Building Codes Board
BCA	Building Code of Australia 2015
BOWS	Building Occupant Warning System
D-t-S	Deemed to Satisfy
GFA	Gross Floor Area
NCC	National Construction Code
NLA	Net Lettable Area
RLB	Rider Levett Bucknall

Appendix A

Analysis of Cost Implications

Estimate of Cost Implications for Amendments to the Deemed to Satisfy Provisions

RLB | Rider Levett Bucknall

Appendix A - Analysis of Cost Implications

Sprinkler Installation to Balconies		Residential Apartments	10 Storey Hotel	Hospital Building	Aged Care Facility
Proposal		2	3	9a	9c
		$	$	$	$
1	Supplement Existing Sprinkler System to Balconies Previously Exempt				
	- sprinkler installation materials (sprinkler head, pipework, fittings, penetrations)	39,000	50,000	N/A	37,000
	- upgrade of booster pump system	-	-	N/A	8,500
	- labour cost of supplemental sprinkler installation	9,000	18,000	N/A	10,000
	Additional Sprinkler Cost	**48,000**	**68,000**	**-**	**55,500**
	Original Sprinkler Installation Cost	**380,000**	**700,000**	**-**	**680,000**
	Proportional % Increase of Overall Sprinkler Cost	**12.63%**	**9.71%**	**0.00%**	**8.16%**
	Original Total Building Cost	**34,800,000**	**38,229,000**	**-**	**28,207,190**
	Proportional % Increase of Overall Building Cost	**0.14%**	**0.18%**	**0.00%**	**0.20%**

***Please refer to Rider Levett Bucknall's report Section 2.0 for full detail of the basis of estimate and specific assumptions and exclusions**

Oceania

t. +61 2 9922 2277
e. enquiries@oceania.rlb.com

Asia

t. +852 2823 1823
e. enquiries@emea.rlb.com

EMEA

t. +44 20 7398 8300
e. enquiries@emea.rlb.com

Americas

t. +1 602 443 4848
e. enquiries@americas.rlb.com

RLB | Rider Levett Bucknall