Building and Construction Authority

An MND Statutory Board

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To: Building Owners, Developers, Engineers, Builders and Facility Managers

For enquiries, please contact:
Building Resilience Group (#10-01)
Tel: 1800 3425 222 (1800-DIAL-BCA)
or use our Online Feedback Form at:
https://www.bca.gov.sg/feedbackform/

REMINDER ON GOOD DESIGN AND MAINTENANCE PRACTICES FOR SUSPENDED CEILINGS

To ensure the safety of occupants, building owners are strongly advised to conduct regular inspections and maintenance of their suspended ceilings. This is to prevent potential dislodgements or collapses that could result in injuries or even fatalities. In addition, owners, designers, and builders should refer to the recommended design guides and circulars listed in Annex A below to adopt best practices for the design, installation, and maintenance of suspended ceilings in their buildings. These resources provide detailed information on the appropriate materials, installation methods, and maintenance procedures to ensure the structural integrity and safety of suspended ceilings.

Suspended Ceilings in Buildings in Coastal Areas

2 Suspended ceilings in buildings that are located near or adjacent to the coast may be more susceptible to adverse weather conditions, such as higher wind gusts, compared to those situated inland. This was observed in a recent incident involving the collapse of indoor suspended ceilings in several units of a worker's dormitory located near the coast. Investigations revealed that the collapse was caused by the supporting hanger rods' inadequate capacity to resist the wind load that occurred on the day of the incident when the doors and windows of the naturally ventilated rooms were left open.

Design of Suspended Ceilings in Coastal Areas

3 The requirements on designing and testing method for suspended ceilings can be found in the British/European Standard (BS EN 13964:2014 - Suspended ceilings - Requirements and test methods). During the design stage, it is important for the designer and installer to take into consideration the loads that may be imposed on the ceiling system in all expected scenarios. Where the suspended ceiling is expected to be subjected to wind loads, including those that could experience wind impacts despite being located indoors (e.g., in cases of opening of windows and doors), all necessary design measure shall be taken to

enable the ceiling components to resist both upward and downward loads. Particular attention should be taken when the ceilings are installed in buildings that are situated adjacent or near to the coast where potentially, the ceilings could be exposed to more adverse wind load conditions. The wind load for such circumstances should be computed using the Singapore/European Standard SS EN 1991-1-4 (Actions on structures – Wind actions, referring to the Terrain Category 0 – i.e., buildings adjacent to the coast).

4 In addition, we would like to draw to your attention that, although Annex C (informative annex) in the BS EN 13964:2014 recognises the common practice that internal wind load can be discounted, this assumes that the wind load issues are often averted as it is usual for doors and windows to remain closed during severe weather conditions. To prevent similar incidents involving the collapse of suspended ceilings in buildings from happening, where building specific assessment is not carried out to provide effective wind shielding to the suspended ceilings, Annex C in the BS EN 13964:2014 should not be applied for the design of suspended ceilings in buildings that are:

i. adjacent or near to coastal areas; and
ii. the predominant ventilation system of the rooms is intended to be naturally ventilated (notwithstanding that the doors and windows are expected to be closed during inclement weather).

Maintenance of Suspended Ceilings in Coastal Areas

5 As existing indoor suspended ceilings may not have been designed to withstand wind loads, owners and managing agents should regularly remind occupants that doors and windows should remain closed during adverse weather, especially when the building is adjacent or near the coastal areas, where the wind gust is generally stronger.

6 In addition, building owners should carry out regular inspections of the ceiling supports, as the steel hanger rods are susceptible to corrosion, especially those at the coastal areas. Supporting hanger rods should be replaced immediately if their structural capacities are affected by corrosion effects. In cases where there are gaps at the building exterior that could allow wind to enter and possibly dislodge the suspended ceilings, these gaps are recommended to be sealed.

7 If you need any clarification, please contact us through BCA's Online Feedback Form or call 1800 342 5222.

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Yours faithfully,

ER. PUNITHAN SHANMUGAM
DIRECTOR
BUILDING RESILIENCE GROUP
BUILDING AND CONSTRUCTION AUTHORITY
for COMMISSIONER OF BUILDING CONTROL

Annex A - Publications and Past Advisories Related to Suspended Ceiling Design, Installation and Maintenance

18 March 2015: Advisory on Good Practices for Design and Installation of Suspended Ceiling Works

30 November 2018: Reminder on Good Practices for Design and Installation of Suspended Ceiling Works

1 June 2021: Advisory on Good Practices for the Inspection and Maintenance of Suspended Ceilings

1 March 2022: (Publication on) Good Practice Guide for Design, Installation and Maintenance of Building Fixtures

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