S851-12

Post-blast safety evaluation of buildings

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Preface

This is the first edition of CSA S851, *Post-blast safety evaluation of buildings*.

In addition to the subject building, a large-size blast event in a city environment can cause damage to a large number of buildings. To ensure the safety of the occupants of buildings affected by a blast event, and to minimize the potential economic losses caused by the closure or disruption of the normal operation of the affected buildings, it is necessary to evaluate these buildings for their safety and serviceability before they can be reoccupied. Depending on the number and size of buildings involved, and given the desire to minimize unnecessary disruptions in the lives of the occupants and to essential services, it is necessary to develop systematic procedures for post-blast safety evaluation of buildings.

This Guideline was developed based on the "Guide for post-blast safety evaluation of buildings" (Razaqpur et al. 2011). This Guideline applies to suspected or known blast incidents and provides recommendations for emergency response authorities to develop suitable standard operating procedures incorporating criteria for post-blast safety inspection and assessment.

Although this Guideline is intended to be comprehensive, specific agencies might need to refine procedures as appropriate for their own usage.

CSA Group gratefully acknowledges McMaster University for the development of post-blast evaluation procedures, and financial support from Defence Research and Development Canada, Centre for Security Science, through project CRTI 3780-2011-30xa-12.

This Guideline was prepared by the Task Force on Post-Blast Assessment of Buildings.

Notes:

(1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*

(2) *Although the intended primary application of this Guideline is stated in its Scope, it is important to note that it remains the responsibility of the users of the Guideline to judge its suitability for their particular purpose.*

(3) *To submit a proposal for change, please send the following information to* ***inquiries@csagroup.org*** *and include "Proposal for change" in the subject line:*

(a) designation (number);

(b) relevant clause, table, and/or figure number;

(c) wording of the proposed change; and

(d) rationale for the change.

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0 Introduction

0.1 General

This Guideline is intended to provide systematic procedures for post-blast structural safety evaluation of buildings. It presents the basic elements necessary to achieve expedient and safe evaluation of buildings affected by a blast event. It provides guidance to the authority having jurisdiction (AHJ) to develop suitable standard operating procedures incorporating criteria for post-blast safety inspection and assessment.

Notes:

(1) *Although emphasis is placed on malicious explosions, these procedures may be equally applied to accidental blast events.*

(2) *Post-blast hazards not addressed in this Guideline include but are not limited to air quality, damaged mechanical and electrical equipment, debris, fire, hazardous materials (i.e., CBRN), secondary explosives, gas leaks, and flooding. See Clause A.0.1 for information on additional precautions, including personal protective equipment (PPE).*

0.2 Overview

The objective of this Guideline is to provide an engineering basis for assessment of the safety of the structural and architectural components of a building after a blast event. Preliminary, Level I structural, and Level II structural evaluation procedures are used to classify the safety of a building.

Structural assessment is one component of the assessment of a building after a post-blast event. The various types of necessary evaluation are identified in Clause 4.

Although the procedures in this Guideline are presented in a format that applies to a single building, the principles can be applied to multiple buildings.

0.3 Users

This Guideline is intended as a tool for qualified inspectors, engineers, and urban search and rescue (USAR) personnel. It provides guidance to an AHJ to develop suitable standard operating procedures (SOP) for performing post-blast safety inspection and assessment. Although the Guideline is comprehensive, further refinement might be necessary by the AHJ as appropriate for implementation.

0.4 Classification and marking

This Guideline has been developed to assist in the proper classification of post-blast safety of buildings. Although typical methods of marking have been provided in Annex C, requirements for marking are outside of the scope of this Guideline.

1 Scope

1.1

This Guideline specifies procedures for the assessment of the safety of the structural and architectural components of a building affected by a blast event.