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Building Security Rating System



Checklists to Assess Risks, Consequences, and Security Countermeasures

EDITED BY

Mohammed M. Ettouney, Ph.D., P.E.

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PREFACE

This document presents a building security rating system (BSRS), which addresses security-related disciplines—from conceptual to design and development to operations and maintenance—and enables improved survivability of buildings and occupants subjected to terrorist attack. The BSRS rates buildings for their relative security using a rigorous system that (1) identifies physical and operational criteria that enhance building security and (2) compares building conformity with those criteria. The system includes the development and maintenance of a security-enhancing physical and operations rating protocol. Personnel training is the key to this end. This training includes, but is not limited to, continued adequate certification and education programs.

Conceptually, the BSRS is similar to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) system; both systems rate buildings according to an accepted set of rules for ensuring particular categories of performance in their respective fields. Technically, the building security rating system is based on the physical and operational features defined in FEMA 426 (2003a). FEMA 426 provides guidance for building stakeholders to reduce physical damage to buildings, related infrastructure, and people caused by terrorist assaults. This approach allows for the effective transfer of decades of federal and Department of Defense (DoD) research and experience to the broader building science community. The guidance of FEMA 426 is presented in the form of a comprehensive qualitative checklist that covers the essential 13 building security disciplines. In addition, FEMA 426 provides a complete commentary to all security items in the checklist to guide the user and ensure accurate implementation. The conceptual and technical basis of the system is described in Section 1.2 of Chapter 1.

The BSRS system is based on three pillars: building classification, security countermeasures, and the building security rating as shown in Fig. P-1. The three are interdependent, and their interdependency is accommodated in the rating system methodology. Note that Version 2.0, presented in this manual, covers only buildings; no other types of infrastructures are covered.

The building is classified, from a security viewpoint, into four classes. The classes (A, B, C, and D, from higher to lower security sensitivity) depend on both security exposure (hazard or threat) and consequence of loss (effects of loss). The classification system covers all important aspects of the hazards and the effects of terrorist attacks on buildings in a qualitative-to-quantitative method. The method is simple, based on a checklist and multiple-choice approach as detailed in Chapter 1. The multiple choices help in assigning quantitative values to the qualitative checklist. A simple method is then applied to quantify the final building security classification (A, B, C, or D). The multiple choice checklists for building classifications are given in Appendix A.

The second pillar of the rating system comprises the five rating categories. From the least secure to the most secure, the ratings are rated bronze, silver, gold, and platinum. Awarding a particular security rating category to a building depends on the building class (the first pillar) and existing security countermeasures (the third pillar). A description of the security rating categories is provided in Chapter 4.

The third pillar of the rating system is the security countermeasure (mitigation) evaluation. The basis of this step is that for each of the five security rating categories and the four building classes, a minimum level of security countermeasures must be implemented. The security countermeasure evaluation identifies 20 levels of countermeasures for the rating category–building class combinations. The different security countermeasures are subdivided by discipline (similar to FEMA 426). Given a desired security rating category, the building must achieve certain combinations of countermeasure levels. The procedures for achieving particular levels of countermeasures are detailed in Chapter 3. The actual checklists of all countermeasures are given in Appendix B.

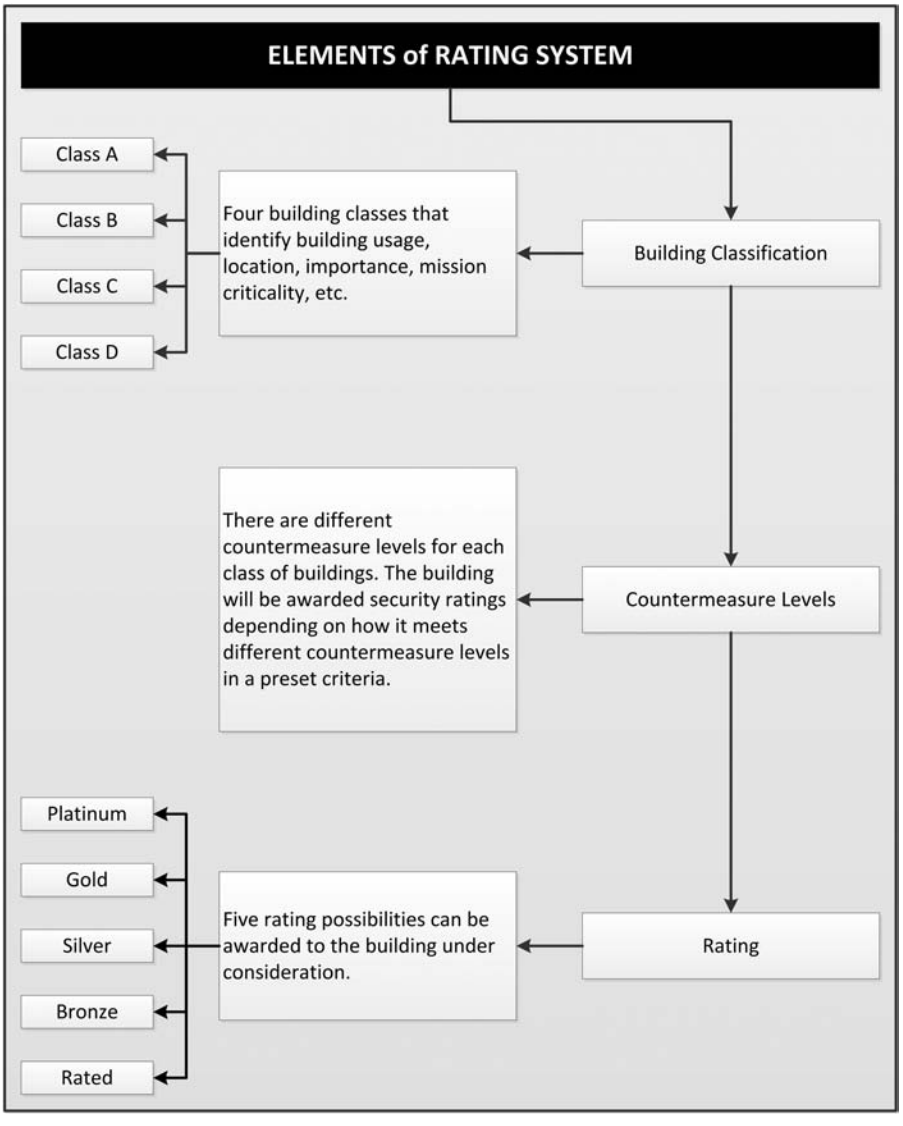


Fig. P-1. Elements of the Security Rating System.

To promote innovations in building security, the rating system includes extra points. Details are provided in Appendix C.

A security evaluation is a complex undertaking, because it covers several disciplines and relies heavily on the qualitative judgment of professionals. To help in standardizing and simplifying the rating system, comprehensive commentary is given in Appendixes D, E, F, G, and H. Finally, a comprehensive bibliography is supplied in the references.

In summary, this document describes a comprehensive method for rating building security. The method is straightforward and comprehensive and is based on the state of the art of building security. It is multidisciplinary, with appropriate representation of all disciplines factoring into building security. The methodology accounts for threat, effect, and mitigation as related to building security and, in doing so, provides a quantifiable measure of building security status: the building security rating. Knowledge of the building security rating can help building stakeholders assess the status of their building security in an objective manner. This rating will allow cost-effective building and public security improvements.

HISTORY OF THE BUILDING SECURITY RATING SYSTEM (BSRS)

Version 1.0 of the building security rating system was developed by Applied Research Associates, Inc., under the direction of the American Society of Civil Engineers (ASCE) Building Security Council (BSC) Rating System Development Committee.

Version 1.1 included several additions, changes, and rearrangements. The modifications were done as a result of the volunteer efforts of the BSC Rating System Development Committee. Version 1.1 was a draft document for review and testing. Versions 1.1 and 1.2 were used in a pilot-testing program.

Version 2.0 is the first version released to the public. Future versions will be issued by the AEI Building Rating System Committee (BRSC) as modifications dictate.

Both Versions 1.0 and 1.1 were named the PLUS system. In Version 2.0, the name of the system has been modified to *building security rating system (BSRS)*.

CHAPTER 1

Introduction

AEI, the Architectural Engineering Institute of ASCE, will develop and maintain a building security rating system (BSRS) that enables building owners to evaluate and improve the security of their facilities.

1.1 PURPOSE

The building security rating system was created to develop construction and operations criteria and a matching rating system to describe the relative security and safety of buildings and building systems, the objective being to enhance the security and safety of building mission and life safety services and thus the safety of building occupants. The rating system addresses the design, engineering, and construction disciplines (planning, architectural, structural, mechanical, electrical, heating, ventilation and air-conditioning, etc.) governing building design, development, and operations, while offering improved survivability of buildings and occupants when subjected to terrorist or criminal attacks involving nuclear, chemical, and biological agents or conventional explosives. The construction and operation criteria are part of a qualitative assessment engine used to govern building design and development, construction, and operations. The rating system is applicable to existing buildings and new building designs and guides owners and facility decision makers in improving survivability (or enhanced continued operations) after an attack. It also provides an indication of security value for facility owners and occupants that is analogous to the U.S. Green Building Council's LEED building rating system. Buildings are rated according to likely survivability, security, and safety given various degrees and types of terrorist or criminal assaults.

Note that in this rating system the term "security" is defined as *the capability to prevent terrorist or criminal attacks, reduce vulnerability to such events, and provide enhanced recovery from an event if one occurs. Consideration of life safety is at the forefront of prevention, mitigation, response, and recovery*.

1.2 BASIS

The rating system builds upon concepts present in other efforts and references.

1.2.1 LEED System

The former Building Security Council (BSC) was modeled after the U.S. Green Building Council (USGBC); however, it addressed security rather than sustainability. While the building security rating system maintains some elements of the LEED system, such as providing an indication of value for facility owners and occupants and categories named after precious metals, it diverges substantially by introducing risk and cost-benefit analysis into the rating methodology. The building security rating system recognizes that facilities have varying levels of risk and that all potential risk mitigation measures do not provide the same benefit. Therefore, the building security rating system introduces a sliding scale for rating a facility's security posture. Higher-risk buildings require more countermeasures in conjunction with the performance requirements of those countermeasures, based on the combined value of the countermeasures in mitigating the risk to the facility and the expense and/or effort required in implementing the countermeasures. This cost-benefit analysis provides a ranked countermeasure checklist with somewhat simple countermeasures at one end of the sliding scale and more complex countermeasures at the other, where the increased risk mitigation justifies the expense.

1.2.2 FEMA 426

The Federal Emergency Management Agency (FEMA) developed the *Reference Manual to Mitigate Potential Terrorist Attacks against Buildings* (FEMA 426, 2003a) to provide information on how to mitigate the effects of potential terrorist attacks. The intended audience includes architects and engineers in private institutions and state and local