NFPA® 101A Annotated Edition

Guide on Alternative Approaches to Life Safety

2013 Edition

Annotated by Ron Coté, P.E.

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An International Codes and Standards Organization

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NFPA® 101A

Guide on

Alternative Approaches to Life Safety

2013 Edition

This edition of NFPA 101A, *Guide on Alternative Approaches to Life Safety*, was prepared by the Technical Committee on Alternative Approaches to Life Safety and released by the Technical Correlating Committee on Safety to Life. It was issued by the Standards Council on May 29, 2012, with an effective date of June 18, 2012, and supersedes all previous editions.

This edition of NFPA 101A was approved as an American National Standard on June 18, 2012.

Origin and Development of NFPA 101A

This 2013 edition of NFPA 101A is the ninth edition. Prior to the development of the 1988 edition of this document, it was published as several appendixes to NFPA *101*, *Life Safety Code*. NFPA 101A is revised every three years on a schedule that lags that of NFPA *101* by one year so as to accurately reflect the requirements of NFPA *101*, against which the NFPA 101A Fire Safety Evaluation Systems (FSESs) measure equivalency.

Chapter 4 first appeared as Appendix C in the 1981 edition of the *Life Safety Code* and Chapters 5, 6, and 7 first appeared in the 1985 edition of the *Life Safety Code* as Appendixes E, F, and G. Chapter 8 was proposed as Appendix H for the 1988 edition of the *Life Safety Code* but instead was published as a chapter of the 1998 edition of NFPA 101A. These chapters were originally prepared by the Center for Fire Research of the National Institute of Standards and Technology (then the National Bureau of Standards). The Committees on Safety to Life have reviewed and modified the systems as appropriate for inclusion. Chapter 9 appeared first in the 2004 edition and provides an FSES for educational occupancies.

This document provides alternative approaches to life safety based on the 2012 *Life Safety Code*. It is intended to be used *with* the *Life Safety Code*, not as a substitute. Section 1.4 of the *Life Safety Code* permits alternative compliance with the *Code* under equivalency concepts where such equivalency is approved by the authority having jurisdiction. The methods contained in this guide can be used to help determine equivalency where used as part of the technical documentation submitted to the authority having jurisdiction.

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Contents

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A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in advisory sections of this document are given in Chapter 2 and those for extracts in the informational sections are given in Annex B. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text should be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex B.

▲ Chapter 1 Administration

1.1 Scope. (Reserved)

1.2 Purpose. (Reserved)

1.3 Application.

▲ **1.3.1*** This guide consists of a number of alternative approaches to life safety. Each chapter is a different system independent of the others and is to be used in conjunction with the 2012 edition of NFPA *101, Life Safety Code.*

▲ **1.3.2** This edition of NFPA 101A contains alternative approaches that are tied to NFPA *101, Life Safety Code.* Each of these systems is recognized by the *Life Safety Code,* in its Annex A, as a method that can be used to assist the authority having jurisdiction in determining equivalent compliance with various chapters of the *Code.*

▲ **1.3.3** The method described in this guide is an index method. Index methods are a type of qualitative risk assessment. Quantitative risk assessments can also be used to evaluate designs that are proposed as alternative approaches to life safety. For information on developing fire risk assessments, see the *SFPE Engineering Guide to Fire Risk Assessment.* Guidance on reviewing fire risk assessments can be found in NFPA 551, *Guide for the Evaluation of Fire Risk Assessments.*

1.3.4 For further information on alternative approaches to fire safety, see "Systems Approach to Fire-Safe Building Design," Section 1, Chapter 9, of the 20th edition of the NFPA *Fire Protection Handbook* and the *SFPE Handbook of Fire Protection Engineering,* 3rd edition, Section 3, "Hazard Calculations," and Chapters 5–10, "Fire Risk Indexing."

▲ Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this guide and should be considered part of the recommendations of this document.

▲ **2.2 NFPA Publications.** National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2013 edition.

NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,* 2013 edition.

NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies,* 2013 edition.

NFPA 72®, National Fire Alarm and Signaling Code, 2013 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* 2012 edition.

NFPA 92, *Standard for Smoke Control Systems,* 2012 edition.

NFPA *101®, Life Safety Code®,* 2012 edition.

NFPA 204, *Standard for Smoke and Heat Venting,* 2012 edition.

NFPA 220, *Standard on Types of Building Construction,* 2012 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies,* 2012 edition.

• NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls,* 2011 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth,* 2011 edition.

NFPA 551, *Guide for the Evaluation of Fire Risk Assessments,* 2010 edition.

NFPA 5000®, Building Construction and Safety Code®, 2012 edition.

NFPA Fire Protection Handbook, 20th edition.

SFPE Handbook of Fire Protection Engineering, 3rd edition.

2.3 Other Publications.

2.3.1 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, www.astm.org.

ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials,* 2010.

ASTM E 119, *Standard Test Methods for Fire Tests of Building Construction and Materials,* 2010b.

2.3.2 SFPE Publications. Society of Fire Protection Engineers, 7315 Wisconsin Avenue, Suite 122 SW, Bethesda, MD 20814.

SFPE Engineering Guide to Fire Risk Assessment.

2.3.3 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096, www.ul.com.

ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, 2008, Revised 2010.

2.3.4 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Advisory Sections.

NFPA 5000®, Building Construction and Safety Code®, 2012 edition.

▲ Chapter 3 Definitions

3.1 General. The definitions contained in this chapter apply to the terms used in this guide. Where terms are not defined in this chapter or within another chapter, they should be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, is the source for the ordinarily accepted meaning.

▲ 3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

▲ 3.2.3 Guide. A document that is advisory or informative in nature and that contains only nonmandatory provisions. A guide may contain mandatory statements such as when a guide can be used, but the document as a whole is not suitable for adoption into law.

3.2.4 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

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▲ 3.2.6 Shall. Indicates a mandatory requirement.

3.2.7 Should. Indicates a recommendation or that which is advised but not required.

▲ 3.3 General Definitions. (Reserved)

▲ Chapter 4 Fire Safety Evaluation System for Health Care Occupancies

4.1 General.

▲ 4.1.1 This chapter is part of an NFPA guide and, therefore, is not mandatory. The term *shall* in this chapter is used to indicate that if the provisions of the chapter are applied, the procedures mandated are to be followed to ensure the effectiveness of the evaluation system.

▲ 4.1.2 The Fire Safety Evaluation System (FSES) is a measuring system. It compares the level of safety provided by an arrangement of safeguards that differ from those specified in NFPA *101*, *Life Safety Code*, to the level of safety provided in a building that conforms exactly with the details of the *Code*.

▲ 4.1.3 This chapter is provided to assist in completion of Figure 4.7, Worksheets for Evaluating Fire/Smoke Zones. The step-by-step instructions for completion appear on the worksheets. They are not repeated within the chapter. This chapter provides expanded discussion and definition of the various items in the worksheet to assist the user when questions of definition or interpretation arise. The chapter is organized to follow the format of the worksheet progressively.

4.2 Procedure for Determining Equivalency.

▲ 4.2.1 Evaluate every fire zone using Figure 4.7 (Worksheets 4.7.1 through 4.7.11). Use the text portion (Section 4.3 through 4.6.13.4.3) of this chapter as a guide.

▲ 4.2.2 The Facility Fire Safety Requirements Worksheet (Worksheet 4.7.10) is used to determine any nonconformance with the requirements on the worksheet.

▲ 4.2.3 Equivalency is achieved if the fire/smoke zone evaluations show equivalency or better in each and every fire zone and the requirements on the Facility Fire Safety Requirements Worksheet (Worksheet 4.7.10) are met.

▲ 4.3 Fire/Smoke Zone.

▲ 4.3.1 A fire/smoke zone is a space that is separated from all other spaces by floors, horizontal exits, or smoke barriers. Every zone on a floor that is subdivided into two or more zones shall have exit routes in accordance with 18.2.4 or 19.2.4 of NFPA *101*. Compartments not meeting these requirements shall be evaluated as part of an adjacent zone. When a floor is not subdivided by horizontal exits or smoke barriers, the entire floor is considered to be the zone.

▲ 4.3.2 Selection of Zones to Be Evaluated. A floor that is not subdivided by horizontal exits or smoke barriers is considered a single zone. The entire facility shall be divided into zones. There shall be no areas that are not in a zone. For a complete evaluation, evaluate every zone in the health care facility individually. From a practical standpoint, most health care facilities have repetitive arrangements so that a complete picture can be developed by evaluating typical zones until all combinations are evaluated. The zones selected should include the following:

(1) Each type of patient zone having a different type of mobility, density, or attendant ratio, as specified in Worksheet 4.7.2
(2) Each zone that represents a significantly different type of construction, finish, or protection system
(3) Zones containing special medical treatment or support activities (operating suites, intensive care units, laboratories)
(4) Zones not involving housing, treatment, or customary access for four or more inpatients simultaneously who are incapable of self-preservation; such zones should be evaluated as follows:
   (a) Any zone, whether or not used for patient egress, shall be permitted to be evaluated on the same basis as a patient use zone. In such case, the value of factor

F in Worksheet 4.7.3 shall be assigned the value of factor *L* ("Zone Location") from Worksheet 4.7.2. In such cases, Safety Parameter 10, "Emergency Movement Routes," from Worksheet 4.7.6 shall be graded "deficient" if the exit capacity is less than that prescribed for the actual occupancy of the space and "<2 routes" if less than 75 percent of the prescribed exit capacity is present.

(b) If the zone is separated by 2-hour fire-rated construction from all patient use zones (including any members that bear the load of a patient use zone) and if any communicating openings through the 2-hour fire-rated construction are protected by 1½-hour fire-protection–rated fire doors, the zone shall be permitted to be excluded from evaluation. In such case, that space shall conform with the portion of the *Life Safety Code* appropriate to its use. In addition, appropriate charges under Safety Parameter 8, "Hazardous Areas," in Worksheet 4.7.6 shall be charged against other zones in the facility.

(c) Evaluation of any unoccupied floor(s) located above the highest floor used for health care occupancy is not required, provided each such unoccupied floor meets the construction requirements of 18.1.6 (NFPA *101*) for new buildings or 19.1.6 (NFPA *101*) for existing buildings, or if each unoccupied floor is protected by automatic sprinklers.

(5) Patient sleeping rooms or suites exceeding 1000 ft^2 (92.9 m^2) or nonsleeping rooms or suites exceeding 2500 ft^2 (230 m^2) of floor area, which should be evaluated as follows:

(a) If the room or suite has a single exit access door, it should be evaluated as a single dead-end zone.

(b) A patient sleeping room or suite of sleeping rooms exceeding the 5000 ft^2 (460 m^2) limitation of 19.2.5.7.2.3(A) (NFPA *101*) should be evaluated as a separate zone.

(c) A patient sleeping suite exceeding the 7500 ft^2 (700 m^2) limitation of 18.2.5.7.2.3(B) or 19.2.5.7.2.3(B) (NFPA *101*) should be evaluated as a separate zone.

(d) A patient sleeping suite exceeding the 10,000 ft^2 (930 m^2) limitation of 18.2.5.7.2.3(C) or 19.2.5.7.2.3(C) (NFPA *101*) should be evaluated as a separate zone.

(e) A room or suite of rooms other than a patient sleeping room, exceeding 10,000 ft^2 (930 m^2), should be evaluated as a separate zone.

▲ **4.4 Maintenance.** Any protection system, requirement, or arrangement that is not maintained in a dependable operating condition or that is used in such a manner that the intended fire safety function or hazard constraint is impaired should be considered defective and receive no credit in the evaluation.

▲ **4.5 Occupancy Risk (Worksheet 4.7.2).** In establishing a system for evaluating occupancy risk, the following facts are recognized:

(1) There is a basic level of risk inherent in every health care facility.

(2) The fuel characteristics of furniture, equipment, and supplies vary with time.

(3) The arrangement of these items within the space available can vary with time.

(4) Consequently, these three factors are not included as parameters in a safety equivalency measurement; to account for these factors, the occupancy risk baseline is set at the inherent risk level, with the presumption that the furniture, equipment, and supplies are the most combustible and adversely located (from a fire safety standpoint) of those items normally found in health care facilities.

▲ **4.5.1 Patient Mobility.**

4.5.1.1 The single most important factor controlling risk in a health care facility is the degree to which patients need assistance in taking the actions necessary for their safety. The level of capability in health care facilities varies from patients who, if informed or directed, are able to take positive, self-protecting actions to those patients who have no ability to move or even to take the simplest actions to safeguard themselves. In some cases, patients are directly connected to a fixed life-support system and are so dependent on it that, regardless of their physical condition or the availability of assistance, they cannot be moved without jeopardy of death or serious harm. In the measurement of occupancy risk factors, the least mobile category of patient expected in the zone determines the risk factor for that zone. The rationale for this approach is that, if a zone accepts any patient with a reduced mobility status, it might accept other such patients at any time. The impact of this approach is that most health care facilities should be rated in the "not mobile" risk category. Mobility status should be based on the minimum level of mobility in an average 24-hour period.

4.5.1.2 Mobility Status Factor. Patient mobility status is based on the capability of each patient to take actions necessary for self-protection. The four classes are defined as follows:

(1) *Mobile.* Capable of readily rising from bed and taking self-protecting actions at approximately the same rate as a healthy adult. To be classified as mobile, the patient must not need assistance in getting out of bed and must be able to open a closed or locked door. Persons shall be considered to be mobile if they are not restrained or in any other way limited in response capabilities so that the type of arousal mechanism that normally would awaken an adult is not effective.

(2) *Limited Mobility.* Those patients who have all of the capabilities of a mobile person except that their rate of travel is significantly slower.

(3) *Not Mobile.* Patients incapable of removing themselves from danger exclusively by their own efforts. Examples include persons who are totally bedridden; who need assistance getting out of bed or moving; and who are restrained, locked in their rooms, or otherwise prevented from taking complete emergency self-protection evacuation actions without assistance.

(4) *Not Movable.* Patients not capable of being moved from the room in which they are housed during the course of a fire. Examples include patients attached to life-support systems or involved in medical or surgical procedures that prohibit their immediate relocation without extreme danger of death or serious harm.

▲ **4.5.2 Patient Density.**

4.5.2.1 The occupancy risk evaluation for occupancy density (number of patients within the zone) measures both the inherent increase in the maximum fire death potential that occurs as the number of patients in a zone increases and the problems involved for a limited staff in handling larger numbers of patients during an emergency.

4.5.2.2 Patient Factor. The density of patients is the number of patients who could potentially be housed in the zone. The patient count should be based on the number of assignable beds in the zone, assuming that they might all be occupied at the time of the fire emergency.

4.5.3 Zone Location.

4.5.3.1 This risk factor relates to fire department accessibility to a fire. The rating system recognizes the inherent advantages

for the first floor zone. It also recognizes the problems of evacuation from higher floors and the virtual impossibility of using external fire-fighting efforts above the sixth floor in any building.

4.5.3.2 Floor Factor. The measured zone's location shall be considered to be on floor one if the floor has direct access to the exterior at or within less than one-half floor height above or below grade. If a building is on a sloping grade, each floor that has such exterior access shall be considered as a first floor for the purpose of measuring fire zones on those floors. The measured zone shall be considered to be on the second to third floor range and the fourth to sixth floor range, based on the height of the zone above the nearest at-grade floor. The zone shall be considered to be above the sixth floor if it is more than six floors above the nearest at-grade floor. The risk factor value for zones in basements is the same as for zones at or above the seventh floor. The problems involved in emergency internal access, in fire fighting and rescue, and in the inability to make external attack in basements are approximately equivalent to those in the upper stories of buildings.

▲ **4.5.4 Ratio of Patients to Attendants.**

4.5.4.1 This risk factor recognizes the importance to patient safety of a staff that is immediately available to respond in an emergency. The emergency actions that might be undertaken by the staff include detection, alarm, fire extinguishment, confinement of the fire, establishment of barriers between the patients and the fire (closing patient room doors), rescue, emergency medical aid, and other related functions. A few of these functions, such as detection and alarming, might not be critically related to the ratio of nursing staff to patients, while those related to rescue and the closing of patient room doors have a strong relationship to the staffing ratio. The staff ratio considered is based on the minimum staffing level immediately available (normally the night shift).

4.5.4.2 Patient–Attendant Factor. The ratio of patients to attendants is based on those patients in the fire/smoke zone and the immediately available attendant staff.

4.5.4.2.1 The ratio calculation shall be based on the minimum staffing level (usually occurring during the night shift). Where nursing stations or other positions of attendants are located at the junction of two or more zones and the location of the station is such that each of the zones has immediate access and is in view of the nursing station, the total staffing assigned to the nursing station can be credited to each of the zones. An exception occurs when staff members are bound by duty assignments (cardiac care units, infant nurseries, operating suites, etc.) that prevent them from responding to other than their assigned zone.

4.5.4.2.2 The evaluation system assesses this risk factor at 4.0 in any case involving periods when no attendants are immediately available to a zone that houses patients but where attendants are available within one floor of all patient floors. This evaluation system is not intended to be used in cases where no staff are present in the building housing patients.

▲ **4.5.5 Patient Average Age.**

4.5.5.1 This risk factor recognizes the increased susceptibility of the elderly and of infants up to one year old to physical harm by smoke particles, gaseous combustion products, and heated air. A larger risk factor is assigned to zones occupied by a population whose average age is above 65 years or below one year. Basically, imposition of this rating demands additional safety protection in nursing homes for the aged and in nurseries.

4.5.5.2 The mode value is used to arrive at the age factor for the patients in the zone. The calculation should be based on the past record of occupants assigned to the zone. Patients under one year old are classified at the same risk level as those over 65. This factor recognizes the susceptibility of infants to fire.

▲ **4.6 Safety Parameters (Worksheet 4.7.6).** Safety parameters are a measure of those building factors that bear on or contribute to the safety of those persons (patients, staff, visitors, others) who might be in the particular zone at the time of a fire. Each of the safety parameters was analyzed. Where the current *Life Safety Code* requirements recognize several different approaches to the parameter, the most important alternatives were specified. Also specified were conditions likely to be encountered in situations failing to meet the explicit *Code* requirements and conditions exceeding those required by the *Code*, but available for increased protection.

▲ **4.6.1 Construction.** Construction types are classified in accordance with the definitions of NFPA 220, *Standard on Types of Building Construction*. Major revisions have been made in the categories and definitions in the recent editions of NFPA 220. Previously, NFPA 220 included requirements for "interior partitions enclosing stairs or other openings through floors." The current edition does not. This change is fully accounted for in this system. *(See 4.6.7.)*

▲ **4.6.1.1** Where the facility includes additions or connected structures of different construction, the rating and classification of the structure shall be based on the following:

(1) Separate buildings, if a 2-hour or greater fire resistance–rated separation exists between the portions of the building
(2) Separate buildings, if the additions and connected structure conform to the provisions of applicable sections of Chapter 18 or 19 (NFPA *101*), whether or not separation is provided
(3) The lower safety parameter point score involved, if neither 4.6.1.1(1) nor 4.6.1.1(2) applies

▲ **4.6.1.2** The floor level used to determine the parameter value is the floor of the fire zone being evaluated. The *floor* or *zone* is specified relative to, and beginning with, the level of exit discharge as defined by 3.3.83.1(NFPA *101*).

4.6.1.3 Where the zone is on a floor below the level of exit discharge, the construction value shall be based on the distance of that floor from the level of exit discharge (i.e., one floor below the level of exit discharge equals "second"; two floors below the level of exit discharge equals "third"; three or more floors below the level of exit discharge equals "fourth and above").

▲ **4.6.2 Interior Finish (Corridor and Exits).** The classification of flame spread is in accordance with Section 10.2 (NFPA *101*). The flame spread classification shall be based on the most combustible surface after deleting trim. No allowance is made in the safety parameter values for Class D or Class E interior finishes. It is not anticipated that such material will be used in health care facilities. In the rare case that such high flame spread interior finish material is involved, an individual appraisal outside the capability of this evaluation system will be required. Interior wall and ceiling finish materials tested in accordance with NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, or NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, as permitted by Section 10.2 (NFPA *101*), and meeting the criteria established

in Section 10.2 (NFPA *101*) for those test standards, shall be scored as Class A interior finish materials (flame spread ≤25).

▲ **4.6.3 Interior Finish (Rooms).** See 4.6.2.

▲ **4.6.4 Corridor Partitions/Walls.** For the purpose of this evaluation, the fire-rated partitions considered are as defined in 18.3.6 (NFPA *101*) for new buildings and 19.3.6 (NFPA *101*) for existing buildings. All elements of the partition, except the door (considered as a separate element in this evaluation), must be included in the determination of its time-rated fire resistance classification according to ASTM E 119, *Standard Test Methods for Fire Tests of Building Construction and Materials*. An exception to the general rule of evaluating doors separately from walls occurs where one or more rooms have no doors *(see 4.6.5)*. In this instance, it is considered that the worth of the fire resistance capabilities of the corridor partition wall is so reduced that the wall should be graded as having no fire resistance. *(See Worksheet 4.7.6.)*

▲ **4.6.4.1** Corridor partitions shall be graded as "none or incomplete" if they do not meet the requirements of 18.3.6 or 19.3.6 (NFPA *101*), as appropriate, including applicable exceptions. In existing buildings, partitions shall be permitted to be graded as "<½ hour," provided the ceiling within the fire/smoke zone is of a design and construction sufficient to resist the passage of smoke and the partition either extends through or terminates at the underside of the ceiling with a smoketight joint.

▲ **4.6.4.2** Corridor partitions shall be graded as "≥½ hour but <1 hour" or "≥1 hour" only where the partitions extend to the underside of the floor or roof construction above in accordance with 18.3.6 or 19.3.6 (NFPA *101*), as appropriate.

▲ **4.6.5 Doors to Corridor.** The classification of doors to the corridor shall be based on the minimum quality of any door in the zone, and the classification shall be determined in accordance with NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*. Doors for protection of vertical openings and hazardous areas that are covered separately in 4.6.7 and 4.6.8 are not included in this evaluation. Doors that do not latch and doors that have louvers shall not be considered in classifying doors to corridors if those doors open to toilet rooms, bathrooms, shower rooms, sink closets, and similar auxiliary spaces that do not contain flammable or combustible materials.

4.6.5.1 No Door. A room shall be considered as not having a door if there is no door in the opening or if there is some other mechanism that prevents closing of the door or otherwise leaves a significant opening between the patient room and the corridor. Doors with louvers or ordinary glass lights shall be classified as "no door." (Ordinary glass lights shall not be considered as making a partition incomplete in locations where both sides of the glass light are fully protected by automatic sprinkler systems.) Doors that have been blocked open by door stops, chocks, tiebacks, or other devices that necessitate manual unlatching or releasing action to close the door shall be classified as "no door." Hold-open devices that release when the door is pushed or pulled (such as friction catches or magnetic catches) shall be permitted, and the door shall be classified under 4.6.5.2, 4.6.5.3, and 4.6.5.4. Also, doors that are not provided with a latch in accordance with 18.3.6.3.5 through 18.3.6.3.8 or 19.3.6.3.5 through 19.3.6.3.7 (NFPA *101*) shall be classified as "no door."

4.6.5.2 Doors of Less Than 20-Minute Fire Protection Rating (<20 min FPR). Doors that are not deficient as described in 4.6.5.1 but that do not meet the requirements of 4.6.5.3 shall be classified as less than 20-minute fire protection rating.

▲ **4.6.5.3 Doors of 20-Minute or More Fire Protection Rating (≥20 min FPR).** Doors shall be considered as having a 20-minute or greater fire protection rating if they are of 1¾ in. (44 mm) thick, solid, bonded wood core construction or any other arrangement of equal or greater stability and fire integrity. The thermal insulation capability of the door need not be considered. Hollow or sheet steel doors, therefore, meet the 20-minute requirement.

4.6.5.4 Twenty-Minute or More Fire Protection Rating and Automatic Closing (≥20 min FPR & Auto Clos.). Automatic-closing devices shall be considered to be present if the door has an arrangement that holds it open in a manner such that it is released by a smoke detector–operated device (e.g., a magnetic or pneumatic hold-open device) prior to the passage of significant smoke from a room of fire origin into the corridor or from the corridor into a room not involved in the fire. Smoke detectors for operation of such doors shall be permitted to be integral with the door closers, mounted at each opening, or operated from systems meeting the requirements for two or more points of credit under 4.6.12. The requirement for 20-minute fire protection rating is the same as in 4.6.5.3.

4.6.5.5 Self-Closing Patient Room Doors. Traditional self-closing doors on individual patient rooms shall be evaluated in the following manner:

(1) If it can be established that the doors are constantly kept in the normally closed position except when persons are actually passing through the openings, the self-closing device shall be considered as equivalent to an automatic-closing device and credited accordingly.
(2) If the self-closing doors are blocked open, they shall be classified as "no door" and a parameter value of –10 invoked.

▲ **4.6.6 Zone Dimensions.** Zone dimension shall be as calculated per 18.3.7.1 or 19.3.7.1 (NFPA *101*).

▲ **4.6.6.1** The length of a corridor "dead end" shall be measured from the point at which a person egressing from the dead end would have an option of egressing in two separate directions.

4.6.6.2 In assessing the values for this parameter, a single value shall be chosen based on the worst safety level in the zone. For example, if one or more dead ends in excess of 50 ft (15 m) but not more than 100 ft (30 m) exist, the parameter value for dead ends (–4) shall be applied regardless of the actual corridor lengths.

▲ **4.6.6.3** Since dead-end corridors and single emergency movement routes *(see 4.6.10)* each confine the occupants of a fire zone to a single means of egress, the effect of these two factors on the parameter value is not cumulative. As indicated by Note b to Worksheet 4.7.6, the parameter value for dead-end corridors is to be 0 instead of either –2, –4, or –6 in the special case where a value of –8 is assessed under 4.6.10 for single emergency movement routes.

4.6.6.4 Zone length applies to the greater dimension of length or width of the zone.

▲ **4.6.7 Vertical Openings.** These values apply to vertical openings and penetrations, including exit stairways, ramps, and other vertical exits of the type recognized by NFPA *101*, *Life Safety Code*, plus pipe shafts, ventilation shafts, duct penetrations, and laundry and incinerator chutes. Enclosures shall be of construction having a fire resistance rating not less than that prescribed for vertical openings *(see Safety Parameter 7 of Worksheet 4.7.6)*. In addition, they shall be equipped with fire doors or acceptable protection of openings into the shafts, all designed and installed to provide a complete barrier to the vertical spread of fire or smoke.

4.6.7.1 A vertical opening or penetration shall be considered open if it has any of the following characteristics:

(1) It is unenclosed.
(2) It is enclosed but does not have doors.
(3) It is enclosed but has openings other than doorways.
(4) It is enclosed with cloth, paper, or similar materials without any sustained flame-stopping capabilities.

4.6.7.2 Where vertical openings are located outside the fire/smoke zone and the separation between the zone and the vertical opening is of 1-hour or greater fire resistance rating and is of higher fire resistance rating than the protection of the vertical opening itself (for example, an open shaft separated from the zone by a 2-hour fire resistance–rated partition with 1½-hour fire protection–rated self-closing fire doors), the rating of this factor for the zone being measured shall be based on the higher of the two fire resistance categories. In this example, a safety parameter value of 3 would be given for the 2-hour fire resistance rating. Where this occurs, however, the space with the vertical opening cannot be considered an exit route or refuge area for that zone when evaluating the emergency movement route parameter addressed in 4.6.10.

4.6.7.3 A vertical opening shall be considered open for more than three floors if there is unprotected penetration of four or more floors on the same shaft without an intervening slab or other cutoff *(also see same area as an unprotected penetration in 4.6.13)*. If a shaft is enclosed at all floors except one and this results in an unprotected opening between the shaft and one, and only one, fire/smoke zone, the parameter value assigned for that shaft opening in the fire/smoke zone where the unprotected opening occurs shall be 0.

▲ **4.6.8 Hazardous Areas.** Hazardous area protection is determined in accordance with Section 8.7 (NFPA *101*). The term *adjacent zone* as used in the evaluation form means any zone, either on the same floor or on the floor immediately below, that physically abuts the zone being evaluated and not separated by 2-hour fire resistance–rated construction. The term *outside zone* as used in the evaluation form means any place within the building other than the fire/smoke zone being measured and not separated by 2-hour fire resistance–rated construction.

▲ **4.6.8.1** In assessing the parameter value for hazardous areas, only one value shall be chosen. It shall be the most severe value corresponding to the deficiencies present. A double deficiency can exist only where the hazard is severe and the space is not sprinkler protected. Double protection consists of both a fire-rated enclosure and automatic sprinkler protection of the hazardous area. If both of these protections are lacking in a severe hazardous location, the double deficiency value shall be chosen. If double deficiencies exist both within the zone and outside the zone, the higher value (–11) for the condition inside the zone shall be chosen. The values are not cumulative, regardless of how many hazardous areas are present. Table 4.6.8.1 provides a matrix to be used to determine degree of deficiency to be assessed.

4.6.8.2 Where the hazard is not severe, the maximum deficiency that can occur is a single deficiency, which shall be permitted to be countered by either of the following means:

(1) A fire resistance–rated enclosure
(2) Automatic extinguishing equipment and enclosure by smoke partitions

Table 4.6.8.1 Hazardous Areas Deficiencies

Protection	Hazard	
	Severe	Not Severe
None	Double	Single
Fire resistance–rated enclosures	Single	None
Automatic sprinklers and smoke partitions	Single	None
Automatic sprinklers and fire resistance–rated enclosures	None	None

4.6.8.3 A single deficiency situation also is considered to exist where a severe hazard is protected by either of the following means, but not by both:

(1) A fire resistance–rated enclosure
(2) Automatic extinguishing equipment and enclosure by smoke partitions

▲ **4.6.9 Smoke Control.** Smoke control definitions are provided in 4.6.9.1 through 4.6.9.3.

4.6.9.1 No Control. There are no smoke barriers (or horizontal exits) on the floor, and there is no mechanical smoke control system.

4.6.9.2 Smoke Barrier Serves Zone. A smoke barrier consists of a partition extending across the entire width of the zone equipped with doors that either are self-closing or are closed upon detection by smoke detectors located at the door arches or other release mechanisms as described in 7.2.1.8 (NFPA *101*). To be credited as a smoke barrier, an existing partition also shall conform with the requirements of 19.3.7.2 through 19.3.7.10 (NFPA *101*). New smoke barriers in either new or existing buildings shall meet the more stringent requirements of 18.3.7.2 through 18.3.7.10 (NFPA *101*). A horizontal exit will act as a smoke partition and is credited as both a smoke barrier *(see 4.6.9)* and an emergency movement route *(see 4.6.10)*.

4.6.9.3 Mechanically Assisted Systems — by Zone. Mechanically assisted smoke control on a zone basis shall include a smoke barrier, as in 4.6.9.2, supported by a tested and accepted smoke control system that obstructs the leakage of smoke between zones. One method of judging the acceptability of smoke control systems is found in NFPA 92, *Standard for Smoke Control Systems*.

▲ **4.6.10 Emergency Movement Routes.** A movement route is any means of egress meeting the requirements for such means specified in 7.2.2 through 7.2.6 (NFPA *101*). Horizontal exits also shall meet the requirements specified in 4.6.10.4. Doors exiting directly to the exterior also shall constitute a movement route from the room containing such a door.

4.6.10.1 Fewer Than Two Routes. The means of emergency movement from a zone is classified as fewer than two routes if there are not at least two remote movement routes serving the zone. Movement routes shall be permitted to be outside the physical limits of the zone.

4.6.10.2 Multiple Routes. The emergency movement route is multiple if the zone occupants have the choice of two or more distinctly separated movement routes from the zone.

▲ **4.6.10.3 Deficient.** The choice of parameter value for deficient emergency movement routes is independent of any values determined in 4.6.7.

4.6.10.3.1 An emergency movement route of a type described by 18.2.2 or 19.2.2 (NFPA *101*) is deficient if the door to a patient room or passage through a smoke barrier is less than 32 in. (810 mm) [41.5 in. (1055 mm) in new buildings] in clear width or if the corridor in the zone between patient rooms and smoke barriers and exits is less than 48 in. (1220 mm) [8 ft (2440 mm) in new buildings] in clear width. These figures are based on the minimum width for a wheelchair to egress a room and the minimum width for the passage of a wheelchair in one direction and an ambulatory person in the opposite direction.

4.6.10.3.2 Exit routes also shall be considered deficient if they fail to meet the requirements of 18.2.1 through 18.2.7 or 19.2.1 through 19.2.7 (NFPA *101*) for the egress route involved. However, any route where the doors from rooms or through partitions or walls are less than 32 in. (810 mm) in the clear, the corridor(s) involved is less than 34 in. (865 mm) wide, or stair access is less than 28 in. (710 mm) in the clear shall not be credited as an egress route.

4.6.10.3.3 Exit routes shall be considered deficient if the route does not otherwise conform to the requirements of Section 7.1 through 7.2.6 (NFPA *101*), even if the routes have been or are acceptable to the authority having jurisdiction.

4.6.10.3.4 Exit routes shall be considered deficient if the capacity of the exits serving the floor containing the zone being evaluated is insufficient for the calculated occupant load of the floor. For buildings not protected throughout by automatic sprinklers, use the capacity factor of 0.6 in. (15 mm) per person for stairs.

4.6.10.4 Horizontal Exits. The presence of a single horizontal exit from the zone being evaluated shall be assigned a parameter value of 1, provided the space on the opposite side of the horizontal exit is capable of handling all of the patients from affected zones.

4.6.10.4.1 To be credited as a horizontal exit, the existing arrangement also shall conform with the requirements of 19.2.2.5 (NFPA *101*). New horizontal exits in new or existing buildings shall meet the more stringent requirements of 18.2.2.5 (NFPA *101*).

4.6.10.4.2 To receive credit for horizontal exits, the zone credited shall conform to the requirements of 7.5.1.1 through 7.5.1.1.4 (NFPA *101*) with the zone served considered a separate portion of the building.

4.6.10.4.3 To receive credit for horizontal exits, each patient sleeping room in the zone shall be within 150 ft (45 m) of travel of a horizontal exit door or exit to grade.

4.6.10.5 Direct Exits. To be credited for direct exits, each patient-use space (except bathrooms, restrooms, and corridors) in the zone shall have a door that is operable by the room occupant(s) and opens directly to the exterior at grade or onto an exterior balcony with direct access to an exterior exit or a smokeproof enclosure. The direct exit shall be ramped or otherwise without steps or changes in elevation that could prevent or obstruct the movement of wheelchairs or wheel-littered patients through the direct exits to a place of safety and refuge.

▲ **4.6.11 Manual Fire Alarm.** The manual alarm systems for new construction shall be in accordance with the requirements of 18.3.4 other than 18.3.4.3.2 (NFPA *101*). Existing construction shall be in accordance with 19.3.4 other than 19.3.4.3.2 (NFPA *101*). Connection to the fire department shall be considered as being met if the fire alarm system is connected directly to the fire department through an approved central station or through other means acceptable to the authority having jurisdiction.

▲ **4.6.12 Smoke Detection and Alarm.** A detection system as used herein is one based on the use of automatic smoke detectors installed in accordance with Section 9.6 (NFPA *101*). Notification shall be in accordance with 18.3.4.3 other than 18.3.4.3.2 or 19.3.4.3 other than 19.3.4.3.2 (NFPA *101*). No recognition is given for thermal detectors; however, credit is given for the use of quick-response sprinklers per Note g of Worksheet 4.7.6. The detection system categories are described in 4.6.12.1 through 4.6.12.5.

4.6.12.1 None. There are no smoke detectors in the zone, or, if present, they are not included in any of the categories of 4.6.12.2 through 4.6.12.5.

4.6.12.2 Corridor Only. Smoke detectors are installed throughout the corridors of the zone involved in accordance with Section 9.6 (NFPA *101*).

4.6.12.3 Rooms Only. Smoke detectors are installed throughout the rooms of the zone involved. These smoke detectors shall be considered as meeting this requirement where there is at least one smoke detector in each room occupied or used by patients. Detectors are not required in restrooms or closets.

4.6.12.4 Corridor and Habitable Spaces. Detection systems installed throughout the corridors of the zone involved and in the habitable spaces (patient rooms, nurses stations, and other areas basically used for human occupancy) shall be considered as meeting the requirements for a corridor and habitable spaces detection system. Closets, toilet rooms, and other auxiliary spaces, as well as ceiling voids, interstitials, and other building spaces not used by humans as a normal part of their regular occupancy, are not required to have detectors.

4.6.12.5 Total Spaces in Zone. Total space provision of detectors includes detector coverage of all spaces, except noncombustible building voids that contain no combustible materials. The total space credit is to be given if the zone measured meets this criterion, regardless of the presence or lack of detectors in other portions of the building.

▲ **4.6.13 Automatic Sprinklers.**

4.6.13.1 Wherever sprinkler protection is involved in an area having an unprotected vertical opening, the sprinkler protection around that vertical opening shall conform to Chapter 8 (NFPA *101*). This protection is required to allow the credit for sprinkler protection but shall in no way reduce any assessed value under Safety Parameter 7 in Worksheet 4.7.6 resulting from an unprotected vertical opening.

4.6.13.2 In Worksheet 4.7.7, the value for sprinkler protection credited to the people movement safety (S_3) category is divided by 2. This produces a safety parameter value of only one-half the value credited in other categories.

4.6.13.3 Each sprinkler system shall be provided with supervision. Each sprinkler system shall be interconnected electrically with the fire alarm system, and the main sprinkler control valve shall be supervised electrically so that at least a local alarm shall sound in a constantly attended location when the valve is closed.

4.6.13.4 In evaluating sprinkler protection within the zone, the protection or lack of protection of hazardous areas is considered separately and covered under 4.6.8. For all other areas in the zone, sprinklers shall be graded based on the categories specified in 4.6.13.4.1 through 4.6.13.4.3.

4.6.13.4.1 None. No credit is applied if there are no sprinklers or if sprinklers, though present, are not sufficient to qualify for one of the other categories specified.

4.6.13.4.2 Corridor and Habitable Space. Habitable space includes patient rooms, nurses' stations, and other areas used basically for human occupancy. Habitable space does not include closets, bathrooms, toilets, elevators, and similar spaces. This safety parameter value is based on standard sprinkler spacings in the areas covered and is conditional, based on the classification of construction type as covered in 4.6.1.

4.6.13.4.2.1 Safety Parameter 1, "Construction" *(see 4.6.1)*, in Worksheet 4.7.6 is based on a "protected" or "fire-resistive" type of construction. Protected or fire-resistive types of construction include Types I, II(222), II(111), III(211), and V(111). This credit is based on a system that effectively provides coverage for all corridor and habitable space in the zone, plus the establishment of water distribution patterns or other protection in a manner to prevent the advance of fire from nonsprinklered spaces into the sprinklered spaces. In buildings of protected or fire-resistive construction, the credit is to be applied to any zone where these conditions are met, whether or not areas outside the zone are protected similarly.

4.6.13.4.2.2 Safety Parameter 1, "Construction" *(see 4.6.1)*, is based on an "unprotected" type of construction. Unprotected types of construction include Types II(000), III(200), and V(000). In any unprotected type of construction, the credit for corridor and habitable space protection is to be given only if, in addition to the conditions described in 4.6.13.4.2.1, sprinkler protection also is provided in all spaces in the building (including attic or loft spaces) with construction elements that are not sheathed, enclosed, or otherwise protected with fire-resistive materials such as gypsum board, plaster, or masonry block.

4.6.13.4.3 Entire Building. Total space automatic sprinkler protection is to be credited only if the entire structure is protected by automatic sprinklers in accordance with 18.3.5 or 19.3.5 (NFPA *101*). This credit also is given where a smoke zone in an existing hospital is renovated to install quick-response or residential sprinklers in accordance with 18.1.1.4.3 (NFPA *101*); however, the mandatory safety requirements values of Worksheet 4.7.8C for nonsprinklered existing hospitals must be used. Wherever quick-response automatic sprinklers are provided for zones as part of the entire building sprinkler system, additional credit shall be permitted to be taken under Safety Parameter 12, "Smoke Detection and Alarm." *(See 4.6.12 and Worksheet 4.7.6.)*

▲ **4.7 Worksheets for Evaluating Fire/Smoke Zones.** The worksheets for evaluating fire/smoke zones use a 10-step process found in Figure 4.7.

▲ **4.7.1 Step 1 — Complete the Cover Sheet Using Worksheet 4.7.1.** See Figure 4.7.

▲ **4.7.2 Step 2 — Determine Occupancy Risk Parameter Factors Using Worksheet 4.7.2.** For each risk parameter in Worksheet 4.7.2, select and circle the appropriate risk factor value. Choose only one value for each of the five risk parameters.

▲ **4.7.3 Step 3 — Compute Occupancy Risk Factor *F* Using Worksheet 4.7.3.** The following steps should be taken:

(1) Transfer the circled risk factor values from Worksheet 4.7.2 to the corresponding blocks in Worksheet 4.7.3.
(2) Compute occupancy risk factor *F* by multiplying the risk factor values as indicated in Worksheet 4.7.3.

▲ **4.7.4 Step 4 — Compute Adjusted Occupancy Risk Factor *R* Using Worksheet 4.7.4 or Worksheet 4.7.5.** The following steps should be taken:

(1) If building is classified as "new," use Worksheet 4.7.4. If building is classified as "existing," use Worksheet 4.7.5.
(2) Transfer the value of *F* from Worksheet 4.7.3 to Worksheet 4.7.4 or Worksheet 4.7.5, as appropriate. Calculate *R*.
(3) Transfer *R* to the block labeled *R* in Worksheet 4.7.9.

▲ **4.7.5 Step 5 — Determine Safety Parameter Values Using Worksheet 4.7.6.** Select and circle the safety value for each safety parameter in Worksheet 4.7.6 that best describes the conditions in the zone. Choose only one value for each of the 13 parameters. If two or more values appear to apply, choose the one with the lowest point value.

▲ **4.7.6 Step 6 — Compute Individual Safety Evaluations Using Worksheet 4.7.7.** The following steps should be taken:

(1) Transfer each of the 13 circled safety parameter values from Worksheet 4.7.6 to every available block in the line with the corresponding safety parameter in Worksheet 4.7.7. For Safety Parameter 13, the value entered in the "People Movement Safety" column is recorded in Worksheet 4.7.7 as one-half the corresponding value circled in Worksheet 4.7.6.
(2) Add each of the four columns, keeping in mind that any negative numbers need to be deducted.
(3) Transfer the resulting total values for S_1, S_2, S_3, and S_4 to the corresponding blocks in Worksheet 4.7.9.

▲ **4.7.7 Step 7 — Determine Mandatory Safety Requirements Values Using Worksheet 4.7.8A, 4.7.8B, or 4.7.8C as Appropriate.** The following steps should be taken:

(1) Using the classification of the building (i.e., new or existing) and the floor where the zone is located, circle the appropriate value in each of the three columns in Worksheet 4.7.8A, 4.7.8B, or 4.7.8C.
(2) Transfer the three circled values from Worksheet 4.7.8A, 4.7.8B, or 4.7.8C to the blocks marked S_a, S_b, and S_c in Worksheet 4.7.9.
(3) The mandatory safety requirements values for basements are based on the distance of the basement level from the closest level of discharge. *(See also 4.6.1.2 and 4.6.1.3.)*

▲ **4.7.8 Step 8 — Determine Zone Fire Safety Equivalency Using Worksheet 4.7.9.** The following steps should be taken:

(1) Perform the subtractions indicated in Worksheet 4.7.9. Enter the differences in the appropriate answer blocks.
(2) For each row, check "yes" if the value in the answer block is zero (0) or greater. Check "no" if the value in the answer block is a negative number.

▲ **4.7.9 Step 9 — Evaluate Other Considerations Not Previously Addressed Using Worksheet 4.7.10.** The equivalency covered by Worksheets 4.7.2 through 4.7.9 includes the majority of the considerations covered by the *Life Safety Code*. Some considerations are not evaluated by this method and must be considered separately. These additional considerations are covered in Worksheet 4.7.10, Facility Fire Safety Requirements Worksheet. Complete one copy of this separate worksheet for each facility.

▲ **4.7.10 Step 10 — Determine Equivalency Conclusion.** Conclude whether the level of life safety is at least equivalent to that prescribed by the *Life Safety Code* using Worksheet 4.7.11, Conclusions. Worksheet 4.7.11 combines the zone fire safety equivalency evaluation of Worksheet 4.7.9 and the additional considerations of Worksheet 4.7.10.

WORKSHEET 4.7.1 COVER SHEET

Fire/Smoke Zone* Evaluation Worksheet for Health Care Facilities

Facility _____ Building _____

Zone(s) evaluated _____

Evaluator _____ Date _____

Complete this worksheet for each zone. Where conditions are the same in several zones, one worksheet can be used for those zones.

*Fire/smoke zone is a space separated from all other spaces by floors, horizontal exits, or smoke barriers.

WORKSHEET 4.7.2 OCCUPANCY RISK PARAMETER FACTORS

Risk Parameters	Risk Factor Values					
1. Patient Mobility (*M*)	Mobility Status	Mobile	Limited Mobility	Not Mobile	Not Movable	
	Risk Factor	1.0	1.6	3.2	4.5	
2. Patient Density (*D*)	No. of Patients	1–5	6–10	11–30	>30	
	Risk Factor	1.0	1.2	1.5	2.0	
3. Zone Location (*L*)	Floor	1st	2nd or 3rd	4th to 6th	7th and Above	Basements
	Risk Factor	1.1	1.2	1.4	1.6	1.6
4. Ratio of Patients to Attendants (*T*)	Patients / Attendant	1–2 / 1	3–5 / 1	6–10 / 1	>10 / 1	One or More* / None
	Risk Factor	1.0	1.1	1.2	1.5	4.0
5. Patient Average Age (*A*)	Age	<65 Years and >1 Year		≥65 Years or ≤1 Year		
	Risk Factor	1.0		1.2		

*A risk factor of 4.0 is charged to any zone that houses patients without any staff in immediate attendance.

WORKSHEET 4.7.3 OCCUPANCY RISK FACTOR CALCULATION

	M		*D*		*L*		*T*		*A*		*F*
Occupancy Risk	☐	×	☐	×	☐	×	☐	×	☐	=	☐

WORKSHEET 4.7.4 ADJUSTED OCCUPANCY RISK FACTOR — NEW BUILDINGS

	F		*R*
1.0 ×	☐	=	☐

WORKSHEET 4.7.5 ADJUSTED OCCUPANCY RISK FACTOR — EXISTING BUILDINGS

	F		*R*
0.6 ×	☐	=	☐

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

FIGURE 4.7 Worksheets for Evaluating Fire/Smoke Zones.

▲ WORKSHEET 4.7.6 SAFETY PARAMETER VALUES

Safety Parameters	Parameter Values						
1. Construction	Combustible Types III, IV, and V				Noncombustible Types I and II		
Floor or Zone	000	111	200	211, 2HH	000	111	222, 322, 442
First	–2	0	–2	0	0	2	2
Second	–7	–2	–4	–2	–2	2	4
Third	–9	–7	–9	–7	–7	2	4
4th and Above	–13	–7	–13	–7	–9	–7	4
2. Interior Finish (Corridors and Exits)	Class C	Class B	Class A				
	–5(0)[f]	0(3)[f]	3				
3. Interior Finish (Rooms)	Class C	Class B	Class A				
	–3(1)[f]	1(3)[f]	3				
4. Corridor Partitions/Walls	None or Incomplete	<½ hr	≥½ hr to <1 hr	≥1 hr			
	–10(0)[a]	0	1(0)[a]	2(0)[a]			
5. Doors to Corridor	No Door	<20 min FPR	≥20 min FPR	≥20 min FPR and Auto Clos.			
	–10	0	1(0)[d]	2(0)[d]			
6. Zone Dimensions	Dead End			No Dead Ends >30 ft and Zone Length Is			
	>100 ft	>50 ft to 100 ft	30 ft to 50 ft	>150 ft	100 ft to 150 ft	<100 ft	
	–6(0)[b]	–4(0)[b]	–2(0)[b]	–2(0)[c](0)[h]	0(0)[h]	1	
7. Vertical Openings	Open 4 or More Floors	Open 2 or 3 Floors	Enclosed with Indicated Fire Resist.				
			<1 hr	≥1 hr to <2 hr	≥2 hr		
	–14	–10	0	2(0)[e]	3(0)[e]		
8. Hazardous Areas	Double Deficiency		Single Deficiency		No Deficiencies		
	In Zone	Outside Zone	In Zone	In Adjacent Zone			
	–11	–5	–6	–2	0		
9. Smoke Control	No Control	Smoke Barrier Serves Zone	Mech. Assisted Systems by Zone				
	–5(0)[c]	0	3				
10. Emergency Movement Routes	<2 Routes	Multiple Routes			Direct Exit(s)		
		Deficient	W/O Horizontal Exit(s)	Horizontal Exit(s)			
	–8	–2	0	1	5		
11. Manual Fire Alarm	No Manual Fire Alarm		Manual Fire Alarm				
			W/O F.D. Conn.	W/ F.D. Conn.			
	–4		1	2			
12. Smoke Detection and Alarm	None	Corridor Only	Rooms Only	Corridor and Habit. Spaces	Total Spaces in Zone		
	0(3)[g]	2(3)[g]	3(3)[g]	4	5		
13. Automatic Sprinklers	None	Corridor and Habit. Space	Entire Building				
	0	8	10				

[a] Use (0) where Parameter 5 is –10.
[b] Use (0) where Parameter 10 is –8.
[c] Use (0) on floor with fewer than 31 patients (existing buildings only).
[d] Use (0) where Parameter 4 is –10.
[e] Use (0) where Parameter 1 is based on first floor zone or on an unprotected type of construction (columns marked "000" or "200").
[f] Use ( ) if the area of Class B or C interior finish in the corridor and exit or room is protected by automatic sprinklers and Parameter 13 is 0; use ( ) if the room with existing Class C interior finish is protected by automatic sprinklers, Parameter 4 is greater than or equal to 1, and Parameter 13 is 0.
[g] Use this value in addition to Parameter 13 if the entire zone is protected with quick-response automatic sprinklers.
[h] Use (0) where zone area ≤22,500 ft² and distance from any point to reach a door in smoke barrier ≤200 ft.

For SI units, 1 ft = 0.3048 m; 1 ft² = 0.092 m².

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 2 of 4)

FIGURE 4.7 ***Continued***

WORKSHEET 4.7.7 INDIVIDUAL SAFETY EVALUATIONS

Safety Parameters	Containment Safety (S_1)	Extinguishment Safety (S_2)	People Movement Safety (S_3)	General Safety (S_4)
1. Construction				
2. Interior Finish (Corr. and Exit)				
3. Interior Finish(Rooms)				
4. Corridor Partitions/Walls				
5. Doors to Corridor				
6. Zone Dimensions				
7. Vertical Openings				
8. Hazardous Areas				
9. Smoke Control				
10. Emergency Movement Routes				
11. Manual Fire Alarm				
12. Smoke Detection and Alarm				
13. Automatic Sprinklers			÷ 2 =	
Total Value	S_1 =	S_2 =	S_3 =	S_4 =

WORKSHEET 4.7.8A MANDATORY SAFETY REQUIREMENTS — NEW HOSPITALS, EXISTING HOSPITALS, OR NEW NURSING HOMES

	Containment (S_a)		Extinguishment (S_b)		People Movement (S_c)	
Zone Location	**New**	**Exist.**	**New**	**Exist.**	**New**	**Exist.**
1st story	11	5	15(12)[a]	4	8(5)[a]	1
2nd or 3rd story[b]	15	9	17(14)[a]	6	10(7)[a]	3
4th story or higher but not high rise	18	9	19(16)[a]	6	11(8)[a]	3
High rise	18	17	19(16)[a]	16	11(8)[a]	7

[a] Use ( ) in zones that do not contain patient sleeping rooms.

[b] For a 2nd story zone location in a *sprinklered* EXISTING hospital, as an alternative to the mandatory safety requirement values set specified in the table, the following mandatory values set shall be permitted to be used: $S_a = 7$, $S_b = 10$, and $S_c = 7$.

WORKSHEET 4.7.8B MANDATORY SAFETY REQUIREMENTS — EXISTING NURSING HOMES

Zone Location	Containment (S_a)	Extinguishment (S_b)	People Movement (S_c)
1st story	0	10	0
2nd story	2	10	2
3rd story	6	14	2
4th story or higher	8	16	2

WORKSHEET 4.7.8C MANDATORY SAFETY REQUIREMENTS — MAJOR REHABILITATION IN NONSPRINKLERED EXISTING HOSPITALS

Zone Location	Containment (S_a)	Extinguishment (S_b)	People Movement (S_c)
1st story	13	17(14)*	8(5)*
2nd or 3rd story	17	19(16)*	10(7)*
4th story or higher	18	19(16)*	11(8)*

*Use ( ) in zones that do not contain patient sleeping rooms.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

FIGURE 4.7 ***Continued***

WORKSHEET 4.7.9 ZONE FIRE SAFETY EQUIVALENCY EVALUATION

									Yes	No
Containment Safety (S_1)	minus	Mandatory Containment (S_a)	≥	0	S_1 ☐	– S_a ☐	= C ☐			
Extinguishment Safety (S_2)	minus	Mandatory Extinguishment (S_b)	≥	0	S_2 ☐	– S_b ☐	= E ☐			
People Movement Safety (S_3)	minus	Mandatory People Movement (S_c)	≥	0	S_3 ☐	– S_c ☐	= P ☐			
General Safety (S_4)	minus	Occupancy Risk (R)	≥	0	S_4 ☐	– R ☐	= G ☐			

WORKSHEET 4.7.10 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

Complete one copy of this worksheet for each facility.
For each consideration, select and mark the appropriate column.

		Met	Not Met	Not Applic.
A.	Building utilities conform to the requirements of Section 9.1.			☒
B.	In new facilities only, life-support systems, alarms, emergency communication systems, and illumination of generator set locations are powered as prescribed by 18.5.1.2 and 18.5.1.3.			
C.	Heating and air conditioning systems conform with the air conditioning, heating, and ventilating systems requirements within Section 9.2, except for enclosure of vertical openings, which have been considered in Safety Parameter 7 of Worksheet 4.7.6.			☒
D.	Fuel-burning space heaters and portable electrical space heaters are not used.			☒
E.	There are no flue-fed incinerators.			
F.	An evacuation plan is provided and fire drills conducted in accordance with 18.7.1/18.7.2 and 19.7.1/19.7.2.			☒
G.	Smoking regulations have been adopted and implemented in accordance with 18.7.4 and 19.7.4.			☒
H.	Combustibility of draperies, upholstered furniture, mattresses, furnishings, and decorations is limited in accordance with 18.7.5 and 19.7.5.			
I.	Fire extinguishers are provided in accordance with the requirements of 18.3.5.12 and 19.3.5.12.			☒
J.	Exit signs are provided in accordance with the requirements of 18.2.10.1 and 19.2.10.			
K.	Emergency lighting is provided in accordance with 18.2.9.1 or 19.2.9.1.			
L.	Standpipes are provided in all new high-rise buildings as required by 18.4.2.			

All references are to NFPA *101*, *Life Safety Code*.

▲ WORKSHEET 4.7.11 CONCLUSIONS

1. ☐ All of the checks in Worksheet 4.7.9 are in the "Yes" column and all applicable considerations in Worksheet 4.7.10 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

2. ☐ All of the checks in Worksheet 4.7.9 are in the "Yes" column and all considerations identified in Worksheet 4.7.10 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

3. ☐ One or more of the checks in Worksheet 4.7.9 are in the "No" column or any consideration identified in Worksheet 4.7.10 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

FIGURE 4.7 ***Continued***

▲ Chapter 5 Fire Safety Evaluation System for Detention and Correctional Occupancies

5.1 General.

▲ **5.1.1** This chapter is part of an NFPA guide and, therefore, is not mandatory. The term *shall* in this chapter is used to indicate that if the provisions of the chapter are applied, the procedures mandated are to be followed to ensure the effectiveness of the evaluation system.

▲ **5.1.2** The fire safety evaluation system is a measuring system. It compares the level of safety provided by an arrangement of safeguards that differ from those specified in NFPA *101*, *Life Safety Code*, to the level of safety provided in a building that conforms exactly with the details of the *Code*.

▲ **5.2 Procedure for Determining Equivalency.** Evaluate the entire facility using Figure 5.5, Worksheets for Evaluating Fire Safety in Detention and Correctional Occupancies (Worksheets 5.5.1 through 5.5.8), as defined in Sections 22.1 and 23.1 (NFPA *101*), on a single worksheet. Where different use conditions or fire protection features are involved, portions of the facility separated from each other by 2-hour or greater fire resistance–rated construction (including any members that bear the load of detention use, egress, or refuge space and with 1½-hour fire protection–rated doors in any communication opening) shall be permitted to be evaluated separately.

▲ **5.3 Maintenance.** Any protection system, requirement, arrangement, or procedure that is not maintained in a dependable operating condition, is used in such a manner that the intended fire safety function or hazard constraint is impaired, or is not in a sufficient state of readiness should be considered defective and should receive no credit in the evaluation.

5.4 Safety Parameters (Worksheet 5.5.3). The safety parameters are a measure of those building factors that bear upon or contribute to the safety of those persons who might be in the building at the time of a fire. *(See Worksheet 5.5.3.)* Each of the safety parameters is to be analyzed, and the safety value for each parameter that best describes the condition in the building is to be identified. Only one value for each of the parameters is to be chosen. If two or more values appear to apply, the one with the lowest point value governs.

▲ **5.4.1 Construction.** Construction types are defined by the fire resistance and combustibility of load-bearing framing members, floor construction, and roof construction in accordance with NFPA 220, *Standard on Types of Building Construction*, which extracts material from *NFPA 5000, Building Construction and Safety Code*. *(See Table 5.4.1.)*

▲ **5.4.1.1** Where the facility includes additions or connected structures of different construction, the rating and classification of the structure shall be based on one of the following:

(1) Separate buildings where a 2-hour or greater fire resistance–rated separation exists between the portions of the building
(2) The lower safety parameter point score involved, where such a separation does not exist

▲ **5.4.1.2** The story used to determine the parameter value is the highest story used for confinement purposes. Story height is based on stories starting with the level of exit discharge. Where there are stories below the level of exit discharge, the maximum value assigned to the construction parameter shall be based on a two-story building or the actual story height, whichever is the lower value.

5.4.1.3 A multitiered open cell block in an existing building shall be permitted to be considered a single story, provided that one or more of the following conditions exist:

(1) A smoke control system is provided (*see recommended design criteria in A.23.3.1.3 of* NFPA *101*) to maintain the level of smoke filling from potential cell fires at least 5 ft (1525 mm) above the floor level of any occupied tier.
(2) A smoke control system as described in 5.4.1.3(1) is provided to maintain the level of smoke filling at least 5 ft (1525 mm) above the exit level where either of the following situations exist:
   (a) The cell block is Use Condition II.
   (b) The cell block is Use Condition III, and all persons housed in the cell block can pass through a free access smoke barrier or freely pass below the calculated smoke level with not more than 50 ft (15 m) of travel from their cell.
(3) Complete automatic sprinkler protection is provided.

▲ **5.4.2 Hazardous Areas.**

5.4.2.1 The assignment of charges for hazardous areas is a four-step process.

▲ **5.4.2.1.1 Step 1 — Identify Hazardous Areas.** Hazardous areas are defined in 22.3.2 and 23.3.2 (NFPA *101*).

▲ **5.4.2.1.2 Step 2 — Determine the Level of Hazard.** A hazardous area is classed as severe if it is an area requiring both automatic sprinkler protection and fire-rated enclosure per 22.3.2.1 (and 22.3.5.2) or 23.3.2.1 (NFPA *101*).

5.4.2.1.3 Step 3 — Determine the Fire Protection Provided. The parameter value for hazardous areas is based on the presence or absence of the fire protection necessary to control or confine the hazard. Two levels of fire protection are considered. The first consists of automatic sprinklers or other appropriate extinguishing system covering the entire hazard. The second is based on fire resistance–rated enclosures, including any bearing members in the space, partitions separating the hazardous area from all other spaces, and doors to the space sufficient to exceed the potential of the fire load involved. Any hazardous space that has either protection system is classified as having single protection. Any hazardous space that is both fully enclosed in a capable fire resistance–rated enclosure and sprinklered is classified as having double-level protection. On this basis, any fuel load that has the potential to overwhelm the available structural capability of both its own enclosure and the basic structure could, as a maximum, have single protection.

5.4.2.1.4 Step 4 — Determine the Degree of Deficiency and Assign Parameter Values. The parameter value ultimately is determined by the degree of the deficiencies of the hazardous area based on the level of protection needed.

Table 5.4.1 Fire Resistance Ratings for Type I Through Type V Construction (hours)

	Type I		Type II			Type III		Type IV	Type V	
	442	332	222	111	000	211	200	2HH	111	000
Exterior Bearing Walls[a]										
Supporting more than one floor, columns, or other bearing walls	4	3	2	1	0[b]	2	2	2	1	0[b]
Supporting one floor only	4	3	2	1	0[b]	2	2	2	1	0[b]
Supporting a roof only	4	3	1	1	0[b]	2	2	2	1	0[b]
Interior Bearing Walls										
Supporting more than one floor, columns, or other bearing walls	4	3	2	1	0	1	0	2	1	0
Supporting one floor only	3	2	2	1	0	1	0	1	1	0
Supporting roofs only	3	2	1	1	0	1	0	1	1	0
Columns										
Supporting more than one floor, columns, or other bearing walls	4	3	2	1	0	1	0	H	1	0
Supporting one floor only	3	2	2	1	0	1	0	H	1	0
Supporting roofs only	3	2	1	1	0	1	0	H	1	0
Beams, Girders, Trusses, and Arches										
Supporting more than one floor, columns, or other bearing walls	4	3	2	1	0	1	0	H	1	0
Supporting one floor only	2	2	2	1	0	1	0	H	1	0
Supporting roofs only	2	2	1	1	0	1	0	H	1	0
Floor/Ceiling Assemblies	2	2	2	1	0	1	0	H	1	0
Roof/Ceiling Assemblies	2	1½	1	1	0	1	0	H	1	0
Interior Nonbearing Walls	0	0	0	0	0	0	0	0	0	0
Exterior Nonbearing Walls[c]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]

H: Heavy timber members *(see NFPA 5000 for requirements).*
[a]See 7.3.2.1 of *NFPA 5000.*
[b]See Section 7.3 of *NFPA 5000.*
[c]See 7.2.3.2.12, 7.2.4.2.3, and 7.2.5.6.8 of *NFPA 5000.*
[**5000:** Table 7.2.1.1]

5.4.2.2 Table 5.4.2.2 provides a matrix to be used to determine the degree of deficiency for this parameter. In some situations, more than one hazardous area with the same or differing levels of deficiency can exist. In this case, the choice is based on the single most serious deficiency for the hazardous area.

▲ **5.4.3 Fire Alarm.** Fire alarms are defined in 5.4.3.1 through 5.4.3.3.

5.4.3.1 No Alarm. There is no fire alarm system, or the system is incomplete and does not meet the requirements for a higher-scored category.

5.4.3.2 Without Fire Department Notification (W/O F.D. Notification). There is a manual fire alarm system or smoke detection system conforming with the appropriate requirements of 22.3.4 or 23.3.4 (NFPA *101*), except that the requirements of 22.3.4.3.2 or 23.3.4.3.2 covering automatic transmission of the alarm to the fire department are not met.

5.4.3.3 With Fire Department Notification (W/ F.D. Notification). There is a manual fire alarm or smoke detection system conforming with the appropriate requirements of 22.3.4 or 23.3.4 (NFPA *101*).

5.4.3.3.1 Without Manual Alarm. There is no manual alarm system, but a smoke detection alarm system or sprinkler system recognized under Safety Parameter 4 or Safety Parameter 5 of this system is provided and is arranged to transmit an alarm automatically to the fire department under either of the following conditions:

(1) Fire resistance and structural strength exceed maximum potential of hazard.
(2) Fire resistance or structural strength is not sufficient to withstand potential of hazard.

Table 5.4.2.2 Hazardous Areas — Degree of Deficiency

	No protection	Sprinkler protection	Fire resistance–rated enclosure	Sprinklered and fire resistance–rated enclosure
Hazardous area	Single deficiency	No deficiency		
Severely hazardous area	Double deficiency	Single deficiency	Single deficiency* Double deficiency†	No deficiency* Single deficiency†

*If fire resistance and structural strength exceed maximum potential of hazard.
†If fire resistance and structural strength are not sufficient to withstand potential of hazard.

5.4.3.3.2 With Manual Alarm. There is a manual alarm system, and it is arranged to transmit an alarm automatically to the fire department.

▲ **5.4.4 Smoke Detection.**

5.4.4.1 General. A detection system as used herein is one based on the use of smoke detectors meeting the installation requirements of 22.3.4.4 and 23.3.4.4 (NFPA *101*) and *NFPA 72, National Fire Alarm and Signaling Code*, with the extent of coverage as defined in 5.4.4.2. No credit is given for thermal detectors in habitable spaces.

5.4.4.2 The detection system categories are described in 5.4.4.2.1 through 5.4.4.2.5.

5.4.4.2.1 None. There are no smoke detectors, or, if present, they do not meet the requirements for a higher-scored category.

5.4.4.2.2 Corridors, Common Spaces, and Sleeping Rooms for More Than Four Persons. Smoke detection requirements of such spaces located within the residential housing area are covered by smoke detector installations in accordance with *NFPA 72, National Fire Alarm and Signaling Code*. In Use Condition II dormitory rooms in sprinklered buildings where staff is present whenever the dormitory room is occupied, detectors may be omitted from the dormitory room but not from the corridors and common spaces.

5.4.4.2.3 All Sleeping Rooms. Smoke detectors shall be considered as meeting the requirement when there is at least one smoke detector in each sleeping room occupied or used by prisoners. In rooms having a dimension in excess of 30 ft (9.1 m), additional detectors are provided so that detector spacing does not exceed approximately 30 ft (9.1 m). Detectors are not required in restrooms or closets.

5.4.4.2.4 Full Coverage. The requirements of 5.4.4.2.2 and 5.4.4.2.3 are met.

5.4.4.2.5 Total Building. Total building detector credit requires conformance with the requirements of *NFPA 72, National Fire Alarm and Signaling Code*, for total coverage.

▲ **5.4.5 Automatic Sprinklers.**

5.4.5.1 General. In evaluating sprinkler protection, the protection or lack of protection of hazardous areas is considered separately and covered under 5.4.2, except that total building protection shall include hazardous areas. In addition, the existence or lack of fire department notification is considered separately under 5.4.3. In all other situations, any sprinkler installations shall conform to 22.3.5 and 23.3.5 (NFPA *101*) and be graded based on the categories specified in 5.4.5.1.1 through 5.4.5.1.3.

5.4.5.1.1 None. No credit is given if there are no sprinklers or if sprinklers, though present, are not sufficient to qualify for one of the other categories specified.

5.4.5.1.2 Residential Housing Areas. The credit for sprinkler protection of residential housing areas is given for arrangements whereby sprinklers are located throughout the areas, such that all space within such areas (including cells or sleeping rooms) is covered by the protection spray pattern of sprinkler heads.

5.4.5.1.3 Entire Building. The building is totally sprinkler protected in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*, for light hazard occupancy (or higher hazard occupancy for any spaces classified as higher hazard by NFPA 13).

▲ **5.4.6 Interior Finish.**

5.4.6.1 Classification of interior finish is in accordance with Section 10.2 (NFPA *101*).

5.4.6.2 No consideration is included in the safety parameter value for any finish with a flame-spread rating greater than 200 or for any material not rationally measured by ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*. Materials not rationally measured include foamed plastics and asphalt-impregnated paper or other materials capable of inducing extreme rates of fire growth and rapid flashover. In any case involving these materials, the resultant risk is considered to classify any such finish area as a hazardous area to be evaluated under 5.4.2. Note that plywood of ¼ in. (6 mm) or greater thickness should be considered as having a flame-spread rating of 200 or less. Interior wall and ceiling finish materials tested in accordance with NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, or NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, as permitted by Section 10.2 (NFPA *101*), and meeting the criteria established in Section 10.2 (NFPA *101*) for those test standards, shall be scored as Class A interior finish materials (flame spread ≤25).

▲ **5.4.7 Reserved.**

▲ **5.4.8 Cell/Sleeping Room Enclosure.**

5.4.8.1 The parameter value categories for cell or sleeping room enclosures are divided between those for cells or sleeping

rooms that face directly onto a corridor and those for which there is an intervening common space (i.e., day room, group activity space, or other space between the sleeping room and the corridor access).

5.4.8.2 Open. The cell or sleeping room enclosure includes an opening in excess of 0.85 ft^2 (0.08 m^2). In Use Condition V, the closure shall be considered "open" if there are any openings exceeding the minimum necessary for door swing and latch, unless either of the following conditions exists:

(1) The affected cells meet the requirements for mechanically assisted smoke control in 5.4.13.3.
(2) There is a closure for such openings operable from inside the cell.

5.4.8.3 Smoke Resistant <1 Hour. An enclosure qualifies in this category if the walls are complete from slab to slab or to a continuous smoke-resistant ceiling, and if doors are complete, but some wall aspect (wall, ceiling, etc.) is less than 1-hour fire resistance–rated, or the door is not capable of resisting fire for at least 20 minutes.

5.4.8.4 One-Hour Fire Resistance–Rated or Greater (≥1-Hour Fire Resistance). An enclosure qualifies in this category if it meets all of the requirements of 5.4.8.3, all wall aspects have at least a 1-hour fire resistance rating, and the door is capable of resisting fire for at least 20 minutes.

▲ **5.4.9 Separation of Residential Housing Areas from Other Areas.** A residential housing area includes sleeping areas and any contiguous day room, group activity space, or other common space.

5.4.9.1 The parameter value categories for separation of residential housing areas are based on the quality of the common walls, separating partitions, and doors between residential housing areas and the rest of the building. The parameter value is based on the residential housing area that has the lowest quality separation. Where a building contains more than one residential housing area, the separation of residential housing areas from each other also is to be considered equivalent to the separation of a residential housing area from some other type of space. In buildings entirely composed of a single residential housing area, the separation is considered to be fire resistant if there is at least a 30 ft (9.1 m) separation from other structures and smoke resistant if there is a separation of less than 30 ft (9.1 m).

5.4.9.2 Classification of internal separations is based on the criteria in 5.4.9.2.1 through 5.4.9.2.3.

5.4.9.2.1 Incomplete. Any separation that does not meet the criteria for 5.4.9.2.2 or 5.4.9.2.3 is incomplete.

5.4.9.2.2 Smoke-Resistant Less Than 1 Hour. An enclosure qualifies in this category if the walls are complete from slab to slab or to a continuous smoke-resistant ceiling, and if doors are complete, but some wall aspect (wall, ceiling, etc.) is less than 1-hour fire resistance–rated or the door is not capable of resisting fire for at least 20 minutes.

5.4.9.2.3 One-Hour Fire Resistance or Greater (≥1-Hour Fire Resistance). An enclosure qualifies in this category if it meets all of the requirements of 5.4.9.2.2, all wall aspects have at least a 1-hour fire resistance rating, and the door is capable of resisting fire for at least 20 minutes.

▲ **5.4.10 Exit System.**

5.4.10.1 General. Exit routes are the paths of travel from the residential housing area to outside of any of the types and arrangements described in Chapter 7 (NFPA *101*). The exit route starts at the corridor interface with the cell or common space as indicated by 5.4.8.

5.4.10.2 Multiple Routes. Multiple routes exist where the occupants of any residential housing area have, either from the residential housing area or through access in a corridor adjacent to the residential housing area, a choice of two separate exit routes in accordance with 22.2.4 or 23.2.4 (NFPA *101*) to the outside of the types specified in 22.2.2 and 23.2.2 (NFPA *101*).

5.4.10.3 Deficient. An exit route is deficient if it is usable with reasonable safety but fails to meet any of the applicable criteria in Chapter 7 (NFPA *101*).

5.4.10.4 Direct Room Exits. To be credited with direct room exits, each cell or other sleeping room must have a door that opens to the exterior at grade or to an unenclosed exterior balcony with direct access to an exterior exit or smokeproof enclosure. The locking of such a door must be no more restrictive than that required for the least restrictive exit or smoke barrier door for the use condition involved. In large rooms, the maximum travel distance from any occupiable location to a direct room exit must not exceed 50 ft (15 m). Where the separation of the individual sleeping rooms from other spaces and from each other is smoke resistant, the credit for direct room exits is applicable even if there are no other exit routes from the involved sleeping rooms.

5.4.10.5 No exit shall be considered in this parameter unless the locking arrangement conforms with the criteria for the use condition being applied to the facility.

▲ **5.4.11 Exit Access.**

5.4.11.1 Exit access is the travel distance from any point in a room to an exit (or to a smoke barrier in an existing building). In addition, any exit arrangement that does not conform with 22.2.6.2 (NFPA *101*) for new buildings or with 23.2.6.2 (NFPA *101*) for existing buildings shall receive a parameter value no higher than the score for egress travel [i.e., >150 ft (>45 m) and ≤200 ft (≤61 m)].

5.4.11.2 The penalty for dead-end access shall be assessed where any corridor affords access in only one direction to a required exit from that corridor. The calculation of the distance to determine the parameter value is the measurement from the centerline of the doorway exiting to the corridor to the doorway of the exit from the corridor or building, whichever is shorter. Exit travel is the distance from the door to the corridor to the point where the building is exited or a stairwell is entered, whichever is shorter. Where the distance to the stairwell is the shorter distance, that distance shall be based on the distance to the door enclosing the stairwell if the stairwell is enclosed, or to the top tread if the stairwell is open.

▲ **5.4.12 Vertical Openings.**

5.4.12.1 General. These values apply to vertical openings and penetrations, including exit stairways, ramps, and any other vertical exits, pipe shafts, ventilation shafts, duct penetrations, and laundry and incinerator chutes. The charge for vertical openings shall be based on the presence or lack of enclosure and the fire resistance rating of the enclosure, if provided.

5.4.12.2 Open or Incomplete. A vertical opening or penetration shall be classified as an open or incomplete enclosure if it has any of the following characteristics:

(1) It is unenclosed.
(2) It is enclosed but does not have doors.

(3) It is enclosed but has openings other than doorways.
(4) It is enclosed with cloth, paper, or similar materials without any sustained firestopping capabilities.

5.4.12.2.1 If a shaft other than a credited exit route (i.e., credited as one of the multiple routes required in 5.4.10 or in determining travel distance in 5.4.11) is enclosed on all floors but one, and this results in an unprotected opening between that shaft and one, and only one, floor, the parameter value assigned to that shaft shall be 0. If a required egress route is contained in that shaft, the parameter value shall be –2.

5.4.12.2.2 If vertical firestopping is incomplete, the vertical opening shall be evaluated using the criteria of 5.4.12.2 and 5.4.12.2.1.

5.4.12.3 Communicating Floors. Communicating floor levels shall be permitted without enclosure protection between levels, provided they meet the requirements of 22.3.1 or 23.3.1 (NFPA *101*), as appropriate.

5.4.12.4 Open Tiered Cells. The *open or incomplete enclosures* category does not apply to open, multitiered cell blocks in existing buildings classified as single-story buildings in accordance with 5.4.1.

5.4.12.5 Smoke Resistant. A complete enclosure is provided and is capable of resisting the passage of smoke but does not meet the fire resistance requirements of 8.6.5 (NFPA *101*). Unprotected vertical openings in accordance with 22.3.1(2) and 23.3.1.1(2) (NFPA *101*) shall be considered to be smoke resistant.

5.4.12.6 Fire Resistant. A smoke-resistant enclosure is provided that also meets the fire resistance requirements of 8.6.5 (NFPA *101*). Atriums in accordance with 8.6.7 (NFPA *101*) shall be considered to be fire resistant.

▲ **5.4.13 Smoke Control.** Smoke control definitions are provided in 5.4.13.1 through 5.4.13.4.

5.4.13.1 No Control. Smoke barriers (or horizontal exits) are nonexistent on the floor or are not accessible to those confined.

5.4.13.2 Smoke Compartment — Passive. Credit for smoke barriers is given to any facility meeting the requirements of 22.3.7 or 23.3.7 (NFPA *101*), as appropriate.

5.4.13.3 Smoke Compartment — Mechanically Assisted. Mechanically assisted smoke control on a compartment basis must include a smoke barrier (or a horizontal exit) supported by a mechanism of automatic control fans, smoke vent shafts, or a combination thereof to provide a pressure differential that assists in confining smoke to the compartment of origin. Fans involved shall be permitted to be special smoke control fans or special adjustments of the normal building air movement fans.

5.4.13.4 Heat and Smoke Vent System. A heat and smoke vent system is a tested and accepted system that handles smoke in order to maintain the level of smoke above head height in the residential housing area. Methods of judging the acceptability of the system are contained in NFPA 92, *Standard for Smoke Control Systems*; and NFPA *101*, *Life Safety Code*, A.23.3.1.3. Additional credit for this system shall be given if the operation of the exhaust system is initiated automatically by smoke detection available in the zone.

▲ **5.5 Worksheets for Evaluating Fire Safety.** The worksheets for evaluating fire safety zones use an eight-step process found in Figure 5.5.

▲ **5.5.1 Step 1 — Complete the Cover Sheet Using Worksheet 5.5.1.** See Figure 5.5.

▲ **5.5.2 Step 2 — Determine the Most Restrictive Use Condition in the Facility Using Worksheet 5.5.2.** See Figure 5.5.

▲ **5.5.3 Step 3 — Determine Safety Parameter Values Using Worksheet 5.5.3.** Select and circle the safety value for each safety parameter that best describes the conditions in the zone. Choose only one value for each of the 13 safety parameters. If two or more values appear to apply, choose the one with the lowest point value.

▲ **5.5.4 Step 4 — Compute Individual Safety Evaluations Using Worksheet 5.5.4.** The following steps should be taken:

(1) Transfer each of the 13 circled safety parameter values from Worksheet 5.5.3 to every available block in the line with the corresponding parameter title in Worksheet 5.5.4. Where the block is marked "÷ 2 =," enter one-half the value from Worksheet 5.5.3.
(2) Add each of the four columns, keeping in mind that any negative numbers need to be deducted.
(3) Transfer the resulting values for S_1, S_2, S_3, and S_4 to the corresponding blocks in Worksheet 5.5.6.

▲ **5.5.5 Step 5 — Determine Mandatory Safety Requirements Using Worksheet 5.5.5A, 5.5.5B, or 5.5.5C as Appropriate.** The following steps should be taken:

(1) Select the proper row in Worksheet 5.5.5A, Worksheet 5.5.5B, or Worksheet 5.5.5C. For high-rise buildings, use Worksheet 5.5.5B. Circle the appropriate values.
(2) Transfer the circled values from Worksheet 5.5.5A, Worksheet 5.5.5B, or Worksheet 5.5.5C to the blocks marked S_a, S_b, S_c, and S_d in Worksheet 5.5.6.

▲ **5.5.6 Step 6 — Compute the Fire Safety Equivalency Evaluation Using Worksheet 5.5.6.** The following steps should be taken:

(1) Perform the subtractions indicated in Worksheet 5.5.6. Enter the differences in the appropriate answer blocks.
(2) For each row, check "yes" if the value in the answer block is zero (0) or greater. Check "no" if the value in the answer block is a negative number.

▲ **5.5.7 Step 7 — Evaluate Other Considerations Not Previously Addressed Using Worksheet 5.5.7.** The equivalency covered by Worksheets 5.5.3 through 5.5.6 includes the majority of the considerations covered by the *Life Safety Code*. Some considerations are not evaluated by this method and must be considered separately. These additional considerations are covered in Worksheet 5.5.7, the Facility Fire Safety Requirements Worksheet. Complete one copy of this separate worksheet for each facility.

▲ **5.5.8 Step 8 — Determine Equivalency Conclusion.** Conclude whether the level of life safety is at least equivalent to that prescribed by the *Life Safety Code* using Worksheet 5.5.8, Conclusions. Worksheet 5.5.8 combines the zone fire safety equivalency evaluation of Worksheet 5.5.6 and the additional considerations of Worksheet 5.5.7.

WORKSHEET 5.5.1 COVER SHEET

Fire Safety Evaluation Worksheet for Detention and Correctional Occupancies

Building Identification _____

Evaluator _____ Date _____

Complete one worksheet for each building evaluated.

WORKSHEET 5.5.2 USE CONDITION

_____ Use Condition II — Zoned Egress

_____ Use Condition III — Zoned Impeded Egress

_____ Use Condition IV — Impeded Egress

_____ Use Condition V — Contained

NOTE: If Use Condition III or Use Condition IV is involved, staff location, remote release locks, or fire detection, or any combination of these, must be sufficient to ensure the prompt release required by the use condition checked.

▲ WORKSHEET 5.5.3 SAFETY PARAMETER VALUES

Safety Parameters	Parameter Values							
1. Construction	V(000)	V(111)	IV(2HH)	III(200)	III(211)	II(000)	II(111)	II(222) or I (ANY)
1 story	−2	0	0	−2	0	0	2	2
2 story	−2	0	0	−2	0	−2	2	2
3 story	−8(−2)[a]	−2(0)[a]	−2(0)[a]	−8(−2)[a]	0	−5(−2)[a]	2	2
≥4 stories	−10(−2)[a]	−4(0)[a]	−4(0)[a]	−10(−2)[a]	−2(0)[a]	−8(−2)[a]	0	2

2. Hazardous Areas	Within Res. Housing Area		Outside Res. Housing Area		None or No Deficiencies
	Double Deficiency	Single Deficiency	Double Deficiency	Single Deficiency	
	−7	−4	−4(−7)[b]	0	0

3. Fire Alarm	No Alarm	W/O F.D. Notification	W/ F.D. Notification	
			W/O Man. Alarm	W/ Man. Alarm
	−1	0	1	2

4. Smoke Detection	None	Residential Housing Area			Total Bldg.
		Partial Coverage		Full Coverage	
		Corr. + Comm. Spa. + Lrg. Sleeping Rms.	All Sleeping Rms.		
	−4(−1)[a]	0	2	4	5

5. Automatic Sprinklers	None	Residential Housing Areas	Entire Building
	0	8	10

6. Interior Finish (Corrs. and Egress)	Class C	Class B	Class A
	−3	−1	0

7. Interior Finish (Other Areas)	Class C	Class B	Class A
	−2	−1	0

8. Cell/Sleeping Room Enclosure	Cells (Rooms) Face on Corridor (Each Cell is a Separate Residential Housing Area)	Intervening Common Space Within Resid. Housing Area		
		Open	Smoke Resistant <1 Hour	≥1-Hour Fire Resistance–Rated
	0	−3(−5)[c] (0)[d]	0(−2)[c]	2(0)[c]

(Worksheet 5.5.3 continues.)

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

FIGURE 5.5 Worksheets for Evaluating Fire Safety in Detention and Correctional Occupancies.

Worksheet 5.5.3 ***Continued***

9. Separation of Resid. Housing Areas from Other Areas	Incomplete				Smoke Resistant <1 Hour		≥1-Hour Fire Resistance–Rated			
	Parameter 5 Value <10		Parameter 5 Value = 10							
	−6		2		2(4)[h]		4(2)[b]			
10. Exit System	<2 Routes		Multiple Routes				Direct Room Exits			
			Deficient		No Deficiencies					
	−6		−2		0		3			
11. Exit Access	Dead Ends				No Dead Ends >50 ft and Travel Is[i]					
	>100 ft		>50 ft[i]		>200 ft		≤200 ft	>150 ft		≤150 ft
	−2(0)[g]		−1(0)[g]		−2(0)[g]		−1(0)[g]			0
12. Vertical Openings	Open or Incomplete Enclosures						Enclosed[e]			
	Thru ≥4 Floors		2–3 Floors		1 Floor		Smoke Resistant			Fire Resistant
	−10(0)[f]		−7(0)[f]		−2(0)[f]		0			2
13. Smoke Control	No Control		Smoke Compartments				Heat + Smoke Vent System			
			Passive		Mechanically Assisted					
	−2		2		3		8			

[a] Use ( ) if Parameter 5 is 10.
[b] Use ( ) if Parameter 1 is based on II(000), III(200), or V(000) construction and Parameter 5 is 0.
[c] Use ( ) for Use Condition V, new construction, where Parameter 5 is 0.
[d] Use ( ):
– For Use Condition II.
– For Use Condition III if intervening space is ≤50 ft.
– For Use Condition IV if Parameter 5 is ≥8 and intervening space is <50 ft.

For existing buildings if either:
– Parameter 13 = 8, or
– Parameter 5 is ≥8 and Parameter 4 is ≥0.

[e] Use 0 in 1-story buildings.
[f] Use ( ) if Parameter 13 is 8.
[g] Use ( ) if Parameter 10 is −6.
[h] Use ( ) for Use Conditions II, III, and IV, new construction, if cells are facing access corridor.
[i] Use 20 ft for Use Condition V.

For SI units, 1 ft = 0.3048 m; 1 ft² = 0.092 m².

WORKSHEET 5.5.4 INDIVIDUAL SAFETY EVALUATIONS

Safety Parameters	Fire Control Provided (S_1)	Egress Provided (S_2)	Refuge Provided (S_3)	General Fire Safety Provided (S_4)
1. Construction				
2. Hazardous Areas		÷ 2 =		
3. Fire Alarm	÷ 2 =			
4. Smoke Detection	÷ 2 =			
5. Automatic Sprinklers		÷ 2 =	÷ 2 =	
6. Interior Finish (Corrs. and Egress)				
7. Interior Finish (Other Areas)	÷ 2 =			
8. Cell/Sleeping Room Enclosure				
9. Separation of Residential Housing Areas from Other Areas		÷ 2 =		
10. Exit System			÷ 2 =	
11. Exit Access				
12. Vertical Openings	÷ 2 =			
13. Smoke Control				
Total	S_1 =	S_2 =	S_3 =	S_4 =

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 2 of 4)

FIGURE 5.5 ***Continued***

WORKSHEET 5.5.5A MANDATORY SAFETY REQUIREMENTS FOR PARTIALLY SPRINKLERED OR NONSPRINKLERED EXISTING BUILDINGS OTHER THAN HIGH-RISE

Use Condition	Stories in Height	Fire Control (S_a)	Egress (S_b)	Refuge (S_c)	General (S_d)
II + III	1 Story	0	4	2	1
	2 Stories	3	6	6	5
	≥3 Stories	5	6	8	7
IV	1 Story	2	8	2	5
	2 Stories	5	10	6	9
	≥3 Stories	7	10	8	11
V	1 Story	6	9	6	9
	2 Stories	9	11	10	13
	≥3 Stories	9	11	10	13

WORKSHEET TABLE 5.5.5B MANDATORY SAFETY REQUIREMENTS FOR NEW BUILDINGS, TOTALLY SPRINKLERED BUILDINGS, AND HIGH-RISE BUILDINGS

		Fire Control (S_a)		Egress (S_b)		Refuge (S_c)		General (S_d)	
Use Condition	Stories in Height	New	Exist.	New	Exist.	New	Exist.	New	Exist.
II, III, IV	1 and 2 Stories	2	2	4	2	–1	–1	2	0
	≥3 Stories	7	2	6	2	5	–1	8	0
V	1 and 2 Stories	10	10	7	6	7	7	9	8
	≥3 Stories	15	10	9	6	13	7	15	8

WORKSHEET 5.5.5C MANDATORY SAFETY REQUIREMENTS — MODERNIZATIONS OR RENOVATIONS IN NONSPRINKLERED EXISTING BUILDINGS OTHER THAN HIGH-RISE

Use Condition	Stories in Height	Fire Control (S_a)	Egress (S_b)	Refuge (S_c)	General (S_d)
II + III	1 Story	4	6	6	6
	2 Stories	5	8	8	8
	≥3 Stories	7	8	10	10
IV	1 Story	6	10	6	10
	2 Stories	7	12	8	12
	≥3 Stories	9	12	10	14
V	1 Story	8	10	8	12
	2 Stories	9	12	10	14
	≥3 Stories	9	12	10	14

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

FIGURE 5.5 *Continued*

WORKSHEET 5.5.6 FIRE SAFETY EQUIVALENCY EVALUATION

						Yes	No
Control Provided (S_1)	minus	Required Control (S_a)	≥	0	S_1 ☐ – S_a ☐ = C ☐		
Egress Provided (S_2)	minus	Required Egress (S_b)	≥	0	S_2 ☐ – S_b ☐ = E ☐		
Refuge Provided (S_3)	minus	Required Refuge (S_c)	≥	0	S_3 ☐ – S_c ☐ = R ☐		
General Fire Safety (S_4)	minus	Required Gen. Fire Safety (S_d)	≥	0	S_4 ☐ – S_d ☐ = G ☐		

WORKSHEET 5.5.7 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

		Yes	No
1.	Utilities and building services conform to the requirements of Sections 22.5 and 23.5, except for enclosure of vertical openings, which have been considered in Safety Parameter 12 of Worksheet 5.5.3.		
2.	24-hour staffing is provided as required by 22.7.1 and 23.7.1.		
3.	Combustibility of furnishing, upholstered furniture, mattresses, and decorations is limited in accordance with 22.7.4 and 23.7.4.		
4.	Portable fire extinguishers are provided at least at staff locations.		
5.	Standpipes are provided in all buildings over two stories in height as required by 22.3.5.5, 22.4.3, or 23.3.5.5.		
6.	If Use Condition III or Use Condition IV is involved, the combination of staff location, remote release locks, and fire detection is sufficient to ensure the prompt release required by those use conditions.		

All references are to NFPA *101*, *Life Safety Code.*

WORKSHEET 5.5.8 CONCLUSIONS

1. ☐ All of the checks in Worksheet 5.5.6 are in the "Yes" column and all applicable considerations in Worksheet 5.5.7 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for detention and correctional occupancies.

2. ☐ All of the checks in Worksheet 5.5.6 are in the "Yes" column and all considerations identified in Worksheet 5.5.7 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for detention and correctional occupancies.

3. ☐ One or more of the checks in Worksheet 5.5.6 are in the "No" column or any consideration identified in Worksheet 5.5.7 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for detention and correctional occupancies.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

FIGURE 5.5 ***Continued***

Chapter 6 Evacuation Capability Determination for Board and Care Occupancies

6.1 General.

6.1.1 This chapter is part of an NFPA guide and, therefore, is not mandatory. The term *shall* in this chapter is used to indicate that if the provisions of the chapter are applied, the procedures mandated are to be followed to ensure the effectiveness of the system. For ease of reading, only the masculine pronoun is used; however, the contents of this chapter apply equally to females and males.

6.1.2 Chapter 33 (NFPA *101*) specifies three sets of requirements for an existing facility based on its evacuation capability. The three levels of evacuation capability defined are *prompt*, *slow*, and *impractical*.

6.1.3 The evacuation capability shall be determined for the residents of a given facility who are living as a group and are provided with staff assistance prior to application of the fire protection requirements. This chapter describes one method for determining evacuation capability.

6.1.4 The evacuation capability for specific facilities, with residents living as a group with staff assistance, is determined by a mathematical method that includes the following:

(1) Determining the evacuation assistance scores of the individual residents
(2) Computing a relative level of evacuation difficulty faced by the resident of a specific facility based on the response capabilities of the staff
(3) Adjusting for vertical egress travel
(4) Calculating an evacuation capability score

6.1.5 Chapter 33 (NFPA *101*) defines the three evacuation capability levels in terms of residents' performance in a timely response to an emergency evacuation with assistance from staff members or other residents. Utilization of this chapter provides a numerical score that can be translated into one of the three levels of evacuation capability.

6.1.6 The evacuation capability shall be permitted to be used with either Chapter 7 of this guide or Chapter 33 (NFPA *101*).

6.2 Procedure for Determining Evacuation Capability.

▲ **6.2.1 Methodology.** Evacuation capability shall be determined via the worksheets included in Figure 6.8.

6.2.2 Evacuation Capability by Zones.

6.2.2.1 Small facilities (those with no more than 16 residents) shall have their evacuation capability scores based on all the residents and the available staff measured in accordance with the criteria for evaluating residents and staff in this chapter.

6.2.2.2 Large facilities (those with more than 16 residents) shall be permitted to have their evacuation capability score calculated on the basis of the entire building, as with small facilities, or on the basis of separate fire or smoke zones. The procedure providing the better (i.e., lower) evacuation capability score shall be permitted to be used. A fire or smoke zone is a portion of the building separated from all other portions of the building by one of the following:

(1) Construction having at least 1-hour fire resistance
(2) A smoke barrier conforming to the requirements of Section 8.5 (NFPA *101*), with the smoke barriers constructed with at least a ½-hour fire resistance rating
(3) In buildings protected throughout with an automatic sprinkler system, construction that is sound and smoke-resistant

6.2.3 If a building is zoned, each zone shall be evaluated separately. The evacuation capability score is based on the residents of that zone and the staff available to that zone in accordance with the staff rating criteria in this chapter.

6.2.4 Where using zones, a separate evacuation capability score shall be determined for zones that include common use spaces where the residents of more than one zone congregate for meals, recreation, or other purposes. In such cases, adjust the resident evacuation assistance scores as appropriate to reflect the different needs that residents might have under such conditions.

6.3 Rating Residents.

6.3.1 Worksheets 6.8.1 through 6.8.4 of Figure 6.8 are used for rating individual residents and also for recordkeeping purposes.

6.3.2 This method of determining evacuation capability has been designed to minimize speculation about how a resident might perform in an actual fire emergency by using ratings based on observed performance. Instead of speculating, raters who are not familiar enough with a resident to provide ratings confidently should consult with an individual who has observed the resident on a daily basis.

6.3.3 Due to the stress of an actual fire emergency, it is likely that some residents will not perform at full capacity. Therefore, ratings based on commonly observed examples of poor performance provide the best readily available indication of behavior that could be reduced by the unusually stressful conditions of an actual fire. All persons are less capable on some occasions, and the ratings should be based on examples of resident performance on a typical "bad" day. Ratings should not be based on rare instances of poor performance.

6.4 Rating Residents Using Worksheets 6.8.1 through 6.8.4.

6.4.1 Risk of Resistance (Line I of Worksheet 6.8.2).

6.4.1.1 General.

6.4.1.1.1 Line I rates the risk that the resident might resist leaving the facility during an emergency evacuation. Unless there is specific evidence that resistance might occur, the resident should be rated as "minimal risk." If more than one rating applies, use the rating with the highest numerical score.

6.4.1.1.2 Specific evidence of resistance means that staff have had to use some physical force in the past. However, an episode of resistance should not be counted if it was the result of a situation that was different enough from an actual fire emergency that it probably does not predict behavior in such an emergency. For example, an incident in which a resident refuses to visit with parents probably does not predict behavior in an actual fire emergency and should not be counted as specific evidence. Resistance can be active (the resident might

have struck a staff member or attempted to run away) or passive (the resident might have "gone limp" or hidden from staff members). Simply complaining or arguing is not considered resistance.

6.4.1.2 Minimal Risk. This rating indicates that there is no specific evidence to suggest that the resident might resist an evacuation.

6.4.1.3 Risk of Mild Resistance. This rating indicates that there is specific evidence that the resident might resist leaving the facility. Examples of specific evidence are as follows:

(1) The resident has mildly resisted instructions from staff. Further, the resistance was brief or easily overcome by one staff member and occurred in a situation similar enough to a fire emergency to predict that the behavior could recur during an actual fire emergency.
(2) The resident has hidden from the staff in a situation similar enough to a fire emergency to predict that the behavior could recur during an actual fire emergency. However, once found, the resident offered no further resistance.

6.4.1.4 Risk of Strong Resistance. The resident might offer resistance that necessitates the full attention of one or more staff members. Examples of specific evidence of such risk include the following:

(1) The resident has struggled vigorously in a situation similar enough to a fire emergency to predict that the behavior could recur during an actual fire emergency.
(2) The resident has totally refused to cooperate in a situation that is similar enough to a fire emergency to predict that the behavior could recur during an actual fire emergency.
(3) The resident has hidden in a situation that is similar enough to a fire emergency to predict that the behavior could recur during an actual fire emergency. Moreover, once found, the resident continued to offer resistance.

6.4.2 Impaired Mobility (Line II of Worksheet 6.8.2).

6.4.2.1 General.

6.4.2.1.1 Line II rates the physical ability of the resident to leave the facility. This rating should reflect the current physical environment in the building where the resident lives and should be based on the resident's lying awake on his bed. The resident is rated according to how easily he can leave, given the presence of factors such as physical barriers that hinder movement (e.g., stairs), his ability to get out of bed, or the chairs normally used. The resident should be given credit for being able to use devices that aid movement (e.g., wheelchairs, walkers, crutches, and leg braces). However, the rater shall be permitted to give credit for such devices only if the devices are always available for an emergency evacuation.

6.4.2.1.2 The resident should be rated on his ability to use the most accessible route out of the facility. For example, a resident who is "self-starting" when using the back door but who "needs limited assistance" to get out the front door would be rated as "self-starting."

6.4.2.1.3 The resident should be rated for performance while under the influence of any routinely administered medication that slows movement.

6.4.2.1.4 Where the resident needs physical assistance to make a timely evacuation, the rating of assistance needed is based on the degree of strength used by the staff member to assist the resident. Guiding or directing the resident by giving gentle pushes or leading by the hand is not considered physical assistance. If more than one rating applies, use the rating with the highest numerical score.

6.4.2.2 Self-Starting. The resident is physically able to start and complete an evacuation without physical assistance.

6.4.2.3 Slow. The resident prepares to leave and travels to the exit (or an area of refuge) at a speed significantly slower than normal. Specifically, the resident is rated "slow" if not able to prepare to leave and then travel from his sleeping room to the exit (or area of refuge) within 90 seconds.

6.4.2.4 Needs Limited Assistance. The resident might need some initial or brief intermittent assistance but can accomplish most of the evacuation without assistance. An example of specific evidence of such mobility is that the resident is physically able to start and complete an evacuation, except that the resident needs help to accomplish the following:

(1) Get into a wheelchair
(2) Descend stairs
(3) Get out of bed
(4) Open a door

6.4.2.5 Needs Full Assistance or Very Slow. The resident "needs full assistance" or is "very slow" as defined in 6.4.2.5.1 and 6.4.2.5.2.

6.4.2.5.1 Needs Full Assistance. The resident either needs physical assistance from a staff member during most of the evacuation or must be assisted by staff in one of the following ways:

(1) Carried from the facility
(2) Helped into a wheelchair and wheeled out of the facility
(3) Helped into leg braces and to descend the stairs

6.4.2.5.2 Very Slow. The resident is very slow if the time necessary to prepare to leave and then travel from his sleeping room to the exit is so long that the staff usually assists the resident to evacuate. Specifically, the resident is rated very slow if unable to prepare to leave and then travel to the exit (or area of refuge) within 150 seconds.

6.4.3 Impaired Consciousness (Line III of Worksheet 6.8.2).

6.4.3.1 General.

6.4.3.1.1 Line III rates the risk that a resident could experience a partial or total loss of consciousness in a fire emergency. Unless there is specific evidence that loss of consciousness might occur during a fire emergency, the resident should be rated as "no significant risk."

6.4.3.1.2 Specific evidence is an indication that the resident has experienced some temporary impairment of consciousness of short duration (seconds or minutes) six or more times during the three months preceding the rating of the resident. Regardless of frequency, if there is specific evidence that loss of consciousness might be caused by the stress of a fire emergency, the resident should be rated as having impaired consciousness. An episode of partial loss of consciousness should be counted only if the impairment was severe enough to significantly interfere with the resident's ability to leave the facility. Do not count episodes where the loss of consciousness was the result of a temporary medical problem (e.g., a severe infection). If more than one rating applies, use the rating with the highest numerical score.

6.4.3.2 No Significant Risk. The resident is not subject to loss of consciousness, or the resident has had fewer than six epi-

sodes of losing consciousness (partial and total) during the three months preceding the rating.

6.4.3.3 Partially Impaired. The resident has had at least six episodes of losing consciousness in the preceding three months, of which the most severe episode was only a partial loss of consciousness; that is, the resident still is able to participate in an evacuation to some degree. Specific evidence that a resident should be rated in this category includes loss of consciousness resulting from mild (partial or petit mal) seizures, dizzy spells, intoxication, or any other partially incapacitating impairment of consciousness.

6.4.3.4 Totally Impaired. The resident has had at least six episodes of losing consciousness in the preceding three months, the most severe episode involving total or severely incapacitating loss of consciousness; that is, the resident needs the full assistance of at least one staff member to get out of the building. Specific evidence that a resident should be rated in this category includes losses of consciousness resulting from severe (generalized or grand mal) seizures, fainting spells, intoxication, or other total or severely incapacitating loss of consciousness.

6.4.4 Need for Extra Help (Line IV of Worksheet 6.8.2).

6.4.4.1 General.

6.4.4.1.1 Line IV rates the possibility that more than one staff member might be needed to evacuate the resident. Specific evidence is a previous need for two or more persons to assist the resident and an indication that the resident could need assistance from two persons in a fire emergency.

6.4.4.1.2 Where determining the need for additional assistance, the evaluator should disregard the physical strength or weakness of staff members. (For example, a large staff member who is exceptionally strong might be able to assist a resident alone, while a smaller staff member might be unable to assist the resident fully. However, there is no assurance that a staff member who is able to assist alone always will be able to respond to a resident requiring extra assistance.)

6.4.4.2 Needs at Most One Staff Member. There is no specific evidence that the resident might need help from two or more persons in a fire emergency.

6.4.4.3 Needs Limited Assistance from Two Staff Members. The resident might need some initial or brief intermittent assistance from two staff members, but otherwise needs help from no more than one. Specific evidence supporting this rating is that a resident needs assistance from no more than one person except to accomplish the following:

(1) Getting into a wheelchair
(2) Descending stairs

6.4.4.4 Needs Full Assistance from Two Staff Members. The resident might need assistance from two staff members during most of an evacuation. Specific evidence of the need for assistance from two staff members follows:

(1) Two persons are needed to carry the resident from the facility.
(2) Two persons are needed to get the resident into a wheelchair and to get the wheelchair down a flight of stairs.
(3) The resident might resist an evacuation vigorously, and two persons are needed to get the resident out of the facility.

6.4.5 Response to Instructions (Line V of Worksheet 6.8.2).

6.4.5.1 General. Line V rates the resident's ability to receive, comprehend, and follow through with simple instructions during a staff-directed evacuation. Residents often do not respond equally well to all staff members; therefore, a resident should be rated on his responses to staff members whose directions he is least likely to follow. If more than one rating applies, use the rating with the highest numerical score.

6.4.5.2 Follows Instructions. The resident usually can be depended on to receive, comprehend, remember, and follow simple instructions.

6.4.5.3 Requires Supervision. The resident generally is capable of following instruction but is not dependable. Therefore, the resident might need to be guided, reminded, reassured, or otherwise accompanied during evacuation but does not require the exclusive attention of a staff member (e.g., a staff member can lead two or more residents who fit this classification simultaneously).

6.4.5.3.1 This category includes elderly persons who sometimes show early signs of senile dementia or Alzheimer's disease (e.g., confusion, disorientation, frequent "misplacement" of possessions) and young children who cannot be depended on to follow through with instructions.

6.4.5.3.2 Residents in this category generally are capable of following instructions except in one of the following situations:

(1) The resident is deaf or hearing impaired and sometimes misinterprets communications from staff using sign language.
(2) The resident sometimes forgets instructions after a brief period of time.
(3) The resident is sometimes distracted or confused and fails to follow through with instructions.
(4) The resident is sometimes groggy and might fail to listen carefully or follow through with instructions.
(5) The resident is sometimes uncooperative without apparent good reason.
(6) The resident is elderly and sometimes becomes "lost" in a familiar place.
(7) The resident is a young child who might become frightened and not follow through with instructions.

6.4.5.4 Requires Considerable Attention or Might Not Respond.

6.4.5.4.1 The resident might fail to receive, understand, or follow through with instructions; that is, the resident might not respond to instructions or general guidance. Therefore, the resident might require most of the attention of a staff member during an evacuation.

6.4.5.4.2 This category includes elderly persons who have the symptoms of senile dementia or Alzheimer's disease (e.g., severe confusion, disorientation, very limited short-term memory).

6.4.5.4.3 Residents in this category might display one or more of the following characteristics:

(1) The resident sometimes does not understand simple instructions.
(2) The resident might not respond to instructions from a particular staff member.

(3) The resident is sometimes emotionally upset and is therefore unwilling to follow instructions.
(4) The resident is deaf or hearing impaired and the staff cannot communicate reliably with the resident.
(5) The resident is very forgetful, easily confused, or easily distracted.

6.4.6 Waking Response to Alarm (Line VI of Worksheet 6.8.2).

6.4.6.1 General.

6.4.6.1.1 Line VI rates the risk that the fire alarm might fail to awaken the resident.

6.4.6.1.2 Residents should be rated as "response probable" unless any of the following conditions exists:

(1) The building does not have an alarm system meeting the requirements of Chapter 33 (NFPA *101*), or the alarm is not sufficiently loud where the resident sleeps (doors should be closed and barriers kept in place where determining the audibility of the fire alarm).
(2) Medication taken by the resident before retiring differs in type or amount (i.e., medication is increased) from the medication taken during waking hours.
(3) The resident has a readily apparent hearing impairment, or the resident's hearing aid is removed before sleeping.
(4) There is specific evidence that the resident is an exceptionally sound sleeper. For example, the resident previously failed to be awakened by a particularly loud noise, and staff members have had to shake the resident vigorously to awaken him.

6.4.6.1.3 Where any of the conditions in 6.4.6.1.2 exist, the resident should be rated as "response not probable" unless the resident's ability to wake up has been demonstrated. The demonstration of the resident's ability to wake up in response to the fire alarm should be conducted after the first half hour of sleep and during the first three hours of sleep. In addition, the resident's ability to wake up in response to the alarm should be demonstrated on two different nights under normal conditions (e.g., without hearing aid, under usual medications). Also, the resident should be alert enough to follow simple instructions within 1 minute after waking. To avoid waking other residents during the demonstrations of the capability of a particular resident, a device that makes a sound that is similar to, but not louder than, the fire alarm shall be permitted to be used (e.g., an alarm clock or clock radio with a sound similar to the fire alarm). Listed and approved tactile alarms shall be permitted as alternative devices used to demonstrate a hearing-impaired resident's response probability.

6.4.6.2 Response Probable. Either none of the conditions in 6.4.6.1.2 affect the resident, or, if any of the conditions exist, the resident's ability to be awakened has been demonstrated.

6.4.6.3 Response Not Probable. One or more of the conditions in 6.4.6.1.2 affect the resident, and either the resident has not been tested for the ability to be awakened by the fire alarm or the resident has failed to demonstrate the ability to be awakened by the fire alarm.

6.4.7 Response to Fire Drills (Line VII of Worksheet 6.8.2).

6.4.7.1 General.

6.4.7.1.1 Line VII rates the resident's ability to leave the facility during fire drills, as demonstrated by the resident's performance, without guidance or advice from the staff. A resident must demonstrate three separate responses reliably and without instructions or supervision to be rated "yes" in each case. The resident is rated "yes" only where he has been specifically trained or instructed in the desired reaction and has demonstrated the desired response in at least three of the last four fire drills in which a response was demonstrated. If the resident has not been involved in four fire drills, the rating shall be permitted to be "yes" only if the resident has demonstrated the desired response during the last two opportunities to demonstrate the response. Ratings are based on demonstrated performance, and any resident who has not been trained to participate in fire drills must be rated "no."

6.4.7.1.2 This rating covers the ability of the resident to make decisions but does not relate to mobility, which is covered separately. For example, a resident might need assistance only in transferring from a bed to a wheelchair but otherwise can initiate and complete an evacuation promptly. Such a resident would be rated "yes" for "Initiates and Completes Evacuation Promptly" but would be rated "Needs Limited Assistance," in Line II, Impaired Mobility.

6.4.7.1.3 Residents should be rated assuming that an emergency could occur when they are least likely to respond well. For most residents, this is after being awakened. Determining the rating should not include difficulties in actually awakening the resident, since there are great differences in how easily the same individual awakens at various times.

6.4.7.2 Initiates and Completes Evacuation Promptly. The resident has demonstrated a proper response to an alarm or warning of a fire by starting and completing the evacuation without unnecessary delay. Specific evidence leading to a rating of "no" includes the following responses:

(1) The resident might not react to the alarm until alerted by a staff member.
(2) The resident spends an excessive amount of time preparing to leave (e.g., getting dressed, observing others).
(3) The resident has a hearing impairment and, therefore, needs to be alerted by a staff member.
(4) The resident is sometimes upset or confused and, therefore, might seek out a staff member before evacuating.
(5) The resident consistently begins an evacuation but is easily distracted and needs some supervision.

6.4.7.3 Chooses and Completes Backup Strategy. The resident has demonstrated the ability to select an alternative means of escape or has taken other appropriate action if the primary escape route is blocked. Specific evidence leading to a rating of "no" is where the resident is unlikely to select a good course of action if the primary escape route cannot be used; that is, the resident has not been trained to find alternative escape routes, find an area of refuge, or perform other appropriate action(s). Where the resident lacks the conceptual ability to understand fire hazards and blocked escape routes, and, therefore, requires supervision, the rating should be "no."

6.4.7.4 Remains at Designated Location. The resident must have demonstrated willingness to remain at a designated safe location during fire drills. (The whereabouts of already evacuated residents needs to be confirmed to avoid dangerous return trips to look for residents who might have returned to buildings.)

6.4.7.4.1 Specific evidence leading to a "yes" for this rating includes the following:

(1) The resident has been specifically trained to remain at a designated location in a safe area and has demonstrated this ability without the presence of staff members in three of the previous four fire drills.
(2) The resident is physically immobile and, therefore, cannot leave the designated location.
(3) The facility uses a motor vehicle (e.g., a van or bus) or a building that is detached and remote from the facility (i.e., another building or a remote garage) as the designated location, and the resident has demonstrated in three of the previous four fire drills the ability to remain there without the presence of a staff member.
(4) The resident might tend to wander, but a reliable resident has been assigned to keep the wandering resident at the designated location without using any force or coercion. Furthermore, this arrangement has been demonstrated as effective in at least three of the previous four fire drills.

6.4.7.4.2 Specific evidence leading to a "no" for this rating includes the following:

(1) The resident has not been trained to remain at a designated location without any staff supervision.
(2) The resident has been trained to remain without staff supervision at a designated location but has failed to demonstrate this capability in three of the previous four fire drills.

6.5 Rating the Staff Shift (Worksheets 6.8.5 through 6.8.11).

6.5.1 This rating is intended to predict the promptness of response of a staff member who is present in the facility, at a given time (shift), and who is capable of assisting residents in an evacuation.

6.5.2 Before rating the staff shift, there are five basic requirements relative to the staff response capability, protection plans, and fire drills that shall be met. The determination of whether or not these requirements are met is recorded on Worksheet 6.8.8, Staff Shift Scores. If the corresponding requirements of 6.5.2.1 through 6.5.2.5 have been met, a "yes" rating should be given.

6.5.2.1 A protection plan shall have been promulgated, and all staff members considered in this rating shall have been trained in its implementation. Regardless of the staff's everyday competencies, they cannot be relied upon to innovate effective life safety actions under the extreme stress and time limitation of an actual fire emergency. Notwithstanding the facility's fire protection features, the staff must have a valid and practiced plan of action that can be put into effect immediately in an emergency. The protection plan should include the following features:

(1) A description of all available evacuation, escape, and rescue routes and the procedures and techniques needed to evacuate all the residents using the various routes
(2) A fundamental knowledge of fire growth, containment, and extinguishment necessary to make reasonable judgments about action priorities and viable egress routes

6.5.2.2 Staff shall be provided in accordance with 6.5.2.2.1 or 6.5.2.2.2.

6.5.2.2.1 The total available staff at any given time is able to handle the individual evacuation needs of each resident who might be in the facility. In calculating evacuation capability, it might be possible to have a ratio of staff to residents that appears to be favorable but that still is unacceptable under this system. This would be the case when a resident needs assistance from two staff members but only one staff member is present. Thus, the situation should be such that all residents can be evacuated by the available staff.

6.5.2.2.2 The facility meets the criteria for an evacuation capability level of "impractical," the resident whose evacuation needs cannot be handled is in a sleeping room or other room that provides adequate refuge from fire outside the room, and there is at least one staff member present who can close the door to the room. For example, a very heavy resident is in a facility, meeting the criteria for impractical level of evacuation capability, with one available staff member who cannot transfer the resident from a bed to a wheelchair. Although the staff member is unable to meet all the resident's evacuation assistance needs, the sleeping room provides adequate refuge.

6.5.2.3 Every staff member considered in this rating shall be able to participate meaningfully in the evacuation of every resident. For example, a staff member who, due to his own disability, might be unable to assist one or more physically disabled residents shall not be included in the rating. However, if a staff member's disability does not limit his ability to assist the residents, then the staff member shall be permitted to be included in the rating.

6.5.2.4 All staff members considered in this rating shall be in the facility when on duty, except as otherwise permitted by 6.5.2.4.1 through 6.5.2.4.4. This rating is based on the assumption that there are staff present when residents are in the facility.

6.5.2.4.1 Unstaffed facilities, which are not covered by this system, shall be permitted to be assigned an evacuation capability level based on the demonstrated ability of the residents to meet the criteria of Chapter 33 (NFPA *101*) without staff assistance.

6.5.2.4.2 Residents who receive only the most favorable ratings on Worksheet 6.8.3 for rating residents shall be permitted to be present in the facility without the presence of staff members.

6.5.2.4.3 A staff member shall be permitted to be at a location outside of the facility where his ability to respond to a fire

emergency from the location is roughly equivalent to his response ability from within the facility. In determining equivalency, the authority having jurisdiction should consider the following:

(1) Whether the fire alarm meets the minimum loudness criteria *(see 6.5.3.2.2)* at the locations outside the facility or whether another staff member who is required to remain in the facility can immediately report a fire emergency to the staff member who is outside
(2) Travel time to the facility
(3) Detection of fire cues (e.g., smoke, noises) from locations outside the facility
(4) Whether the staff member will be notified immediately about which area of the facility has the fire emergency, if the staff member who is outside is required to report fire emergencies in more than one facility or fire zone

6.5.2.4.4 The authority having jurisdiction shall be permitted to grant partial credit (which shall not exceed the promptness of the response score that the staff member receives where required to remain in the facility) for staff members who are permitted at locations outside the facility and who have the ability to respond promptly.

6.5.2.5 Fire drills shall be conducted monthly, and at least 12 fire drills shall have been conducted during the previous year. A facility in operation for less than one year shall be permitted to have conducted a fire drill for each month of its operation.

6.5.3 Staff Shift Scores (Worksheet 6.8.8).

6.5.3.1 The purpose of this rating is to determine which staff shift is likely to be the least able to respond promptly to assist residents in an evacuation. If it is not obvious which staff shift will be the least able to respond, complete separate forms for each staff shift and use the staff shift having the lowest score.

6.5.3.2 Promptness of Response Scores (Worksheet 6.8.7).

6.5.3.2.1 Staff Availability. This rating determines whether there are circumstances in which a staff member is less able to respond appropriately or might be delayed in his response to a fire emergency. A staff member shall be included in this rating only under the following conditions:

(1) He is required to remain within the facility while on duty.
(2) He sleeps less than 100 ft (30 m) from all locations in the portion of the facility being evaluated.
(3) His travel time to any location in the portion of the facility being evaluated does not exceed 60 seconds.

6.5.3.2.1.1 Standby or Asleep. This rating means that the staff member does not have specific duties that ensure an immediate response to the alarm but is otherwise available to assist in a timely manner. This includes live-in staff who might be asleep, showering, or otherwise unable to respond immediately.

6.5.3.2.1.2 Immediately Available. This rating means that the staff member is required to be on duty to provide immediate assistance but is not required to remain in proximity to the residents (e.g., the staff member is allowed to wash clothes or do bookkeeping).

6.5.3.2.1.3 Immediately Available and Close By. This rating means that the staff member, in addition to satisfying the requirement for "immediately available," also is required to remain in proximity to the residents except for brief periods of time.

6.5.3.2.1.4 If the facility is classed as "large" and has multiple fire or smoke zones, some staff members might have responsibilities for residents outside the fire or smoke zone being evaluated. If a staff member's duties include rescue of residents in the fire zone being evaluated, the staff member shall be permitted to be assigned partial or full promptness of response scores. The authority having jurisdiction shall assign the points based on the proximity of the staff member to the zones and the nature of his duties in a fire emergency. This credit shall be given only if there is a smoke detection system that alerts the staff member and a system or procedure for promptly informing the staff member of the general location of the fire.

6.5.3.2.1.5 Individual residents shall be permitted to be assigned responsibilities similar to those of staff members to assist other residents during fire emergencies. The authority having jurisdiction shall be permitted to assign these individual residents as many as eight points for promptness of response, based on their capabilities and responsibilities.

6.5.3.2.2 Alarm Effectiveness. This rating determines whether smoke detector–activated alarm devices are loud enough to alert the staff to a fire emergency dependably.

6.5.3.2.2.1 Assured. To be rated "assured," the alarm shall be "easily noticeable" in all locations where the staff member is permitted, regardless of his rating on the promptness of response factor. "Easily noticeable" means the alarm shall be a minimum of 55 dBA measured at ear level. The authority having jurisdiction shall be permitted to require the alarm to be louder than 55 dBA where background noises could interfere with alarm audibility. For example, the alarm might need to be more than 55 dBA to be heard over noise such as from a washing machine in the laundry or a television in the day room. If there are staff who are permitted to sleep, the alarm shall be a minimum of 70 dBA measured at "pillow" level in any area where the staff might be asleep. The alarm shall be activated by smoke detectors, an automatic sprinkler system, or both. If the facility has smoke detectors meeting the requirements of Chapter 33 (NFPA *101*), the smoke detectors shall activate the alarm. If the facility has an automatic sprinkler system whose fire protection properties are considered in the evaluation of the facility, activation of the sprinkler system shall activate the alarm.

6.5.3.2.2.2 Not Assured. The alarm does not satisfy the conditions specified under "assured." Doors that normally are closed during the staff shift being rated should be closed when determining the loudness of the fire alarm. Any other barriers that could reduce the loudness of the fire alarm also shall be in place.

6.6 Rating the Facility (Worksheet 6.8.9).

6.6.1 The vertical distance from sleeping rooms to a floor level with exits might affect the risk because of the time and difficulty in moving on the stairs.

6.6.2 Special Terminology.

6.6.2.1 Direct Exit. Direct exit shall mean that there is no more than one step between the inside of the facility and either (1) ground level outside or (2) a level area outside the facility that is at least 32 ft^2 (3 m^2). This level area might be a porch or a stairway landing. Where the vertical distance is greater than one step, a ramp shall be permitted to be used to comply with this definition.

6.6.2.2 Vertical Distance. Vertical distance shall refer to the greatest number of floors that separate any resident sleeping room from its nearest direct exit.

6.6.3 All Sleeping Rooms on Floors with Direct Exit. Every room where residents sleep is on a floor with at least one direct exit. Examples of facilities that fall within this category include the following:

(1) A one-story building without sleeping rooms in the basement
(2) A two-story building without sleeping rooms on the second floor
(3) A split-level building with direct exits at each level
(4) A two-story building with sleeping rooms on the second floor that has an exterior stairway from the second floor, with a landing at the second floor that is greater than 32 ft^2 (3 m^2)

6.6.4 Any Sleeping Room One Floor from Exit. There is at least one room where residents sleep in which the shortest vertical distance to a direct exit is one floor. Examples of facilities that fall within this category include the following:

(1) A two-story building with sleeping rooms on the second floor, in the basement, or both
(2) A one-story building where all the exits have stairs that lead to grade without a landing or porch of, at minimum, 32 ft^2 (3 m^2)

6.6.5 Any Sleeping Room Two or More Floors from Exit. There is at least one room where residents sleep in which the shortest vertical distance to a direct exit is two or more floors. Buildings that fall within this category include the following:

(1) A three-story building with sleeping rooms on the third floor and no exterior fire escape
(2) A three-story building with sleeping rooms on the third floor that has an exterior stairway from the third floor, but where the landing at the third floor is less than 32 ft^2 (3 m^2)

6.6.6 Facilities in an Apartment House. If the facility is located in an apartment house and the unit containing the facility requires ascending or descending stairs to move from any sleeping room to the door to the corridor, a score of 1.2 for "vertical distance from sleeping rooms to exit" should be assigned. In all other apartments, the score for vertical distance from sleeping rooms to exits is 1.0.

6.7 Determining Evacuation Capability (Worksheet 6.8.10).

6.7.1 When the scores for the residents, the staff, and the vertical travel distances have been determined, the scores are entered on Worksheet 6.8.10 and the calculation made to obtain a numerical result.

6.7.2 The numerical evacuation capability score then is translated into a level of evacuation capability of either "prompt," "slow," or "impractical" and recorded on Worksheet 6.8.11. This evacuation capability is a valid assessment that shall be permitted to be used in Chapter 7 of this guide or in Chapter 33 (NFPA *101*).

6.8 Worksheets for Rating Residents. The worksheets for rating residents use a seven-step process found in Figure 6.8.

6.8.1 Step 1 — Complete the Cover Sheet Using Worksheet 6.8.1. See Figure 6.8.

6.8.2 Step 2 — Read Section 6.3 and Section 6.4, then Fill out Worksheets 6.8.2 and 6.8.3. Complete both forms for each resident, basing the ratings on commonly observed examples of poor performance.

6.8.3 Step 3 — Compute the Total Resident Evacuation Assistance Score. The following steps should be taken:

(1) List each resident's name on Worksheet 6.8.4. Use a separate scoresheet for each zone being rated. Use additional scoresheets for a large number of residents.
(2) Enter the score for each resident from Worksheet 6.8.3 that was completed for him.
(3) Total the scores for all residents in the facility or zone being rated, as appropriate.

6.8.4 Step 4 — Consider Prequalifications Related to Computing. The following steps should be taken:

(1) Complete the cover sheet in Worksheet 6.8.5.
(2) Complete Worksheet 6.8.6 for the time of day, week, and so on when the combined ratings for staff and residents yield the highest score. This usually is late at night. Where it is not obvious which staff shift will score highest, complete separate forms for each staff shift and utilize the highest score. Read Section 6.5 before filling out this form.

6.8.5 Step 5 — Determine the Staff Shift Score. Note that in large facilities, staff members might be responsible for assisting residents in a fire or smoke zone but also might have responsibilities for residents in other zones. *(See Section 6.5.)* The following steps should be taken:

(1) On Worksheet 6.8.8, list the names of staff members who are required to be on duty in the facility during the shift being rated.
(2) Determine whether the effectiveness of the alarm is "assured" or "not assured." *(See 6.5.3.2.2.)*
(3) Using the values from Worksheet 6.8.7, determine each staff member's "promptness of response score" for the shift being rated. Enter each staff member's name and score in the appropriate spaces on Worksheet 6.8.8.
(4) Total the "promptness of response scores" for the shift rated.

6.8.6 Step 6 — Rate the Facility Using Worksheet 6.8.9. Rate the facility by checking the circle that indicates the vertical distance a resident must travel from a sleeping room (SR) to an exit.

6.8.7 Step 7 — Determine Evacuation Capability. Determine the facility's evacuation capability, using Worksheet 6.8.10. Calculate the score by multiplying the Total Resident Evacuation Assistance Score (Worksheet 6.8.4) by the Vertical Distance from Sleeping Room to Exit (Worksheet 6.8.9) and then dividing by the Staff Shift Score (Worksheet 6.8.8). The evacuation capability is determined and recorded in Worksheet 6.8.11.

WORKSHEET 6.8.1 COVER SHEET

Worksheet for Rating Residents

Resident's name _____ Evaluator _____

Facility _____ Zone _____ Date _____

Write any explanatory remarks here:

WORKSHEET 6.8.2 RATING THE RESIDENT ON THE RISK FACTORS

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ◯ score=0	Risk of Mild Resistance ◯ score=6	Risk of Strong Resistance ◯ score=20		
II. Impaired Mobility (Check only one)	Self-Starting ◯ score=0	Slow ◯ score=3	Needs Limited Assistance ◯ score=6	Needs Full Assistance or Very Slow ◯ score=20	
III. Impaired Consciousness (Check only one)	No Significant Risk ◯ score=0	Partially Impaired ◯ score=6	Totally Impaired ◯ score=20		
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ◯ score=0	Needs Limited Assistance from 2 Staff ◯ score=30	Needs Full Assistance from 2 Staff ◯ score=40		
V. Response to Instructions (Check only one)	Follows Instructions ◯ score=1	Requires Supervision ◯ score=3	Requires Considerable Attention/Might Not Respond ◯ score=10		
VI. Waking Response to Alarm (Check only one)	Response Probable ◯ score=0	Response Not Probable ◯ score=6			

VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ◯ score=0	No ◯ score=8	◯ + ◯ + ◯	
	Chooses and Completes Back-up Strategy	Yes ◯ score=0	No ◯ score=4		
	Remains at Designated Location	Yes ◯ score=0	No ◯ score=6		Sum of These Three Scores

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

FIGURE 6.8 Worksheets for Rating Residents.

WORKSHEET 6.8.3 DETERMINING THE RESIDENT'S OVERALL NEED FOR ASSISTANCE

Compare the numbers in the seven score boxes filled in on Worksheet 6.8.2. Take the highest score from the score boxes and write it in the box at the right.

Evacuation Assistance Score

Notes:

WORKSHEET 6.8.4 RESIDENT SCORES

Resident Name	Evac. Assistance Score	Resident Name	Evac. Assistance Score
Evacuation Assistance Score Total		Evacuation Assistance Score Total	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 2 of 4)

FIGURE 6.8 *Continued*

WORKSHEET 6.8.5 COVER SHEET

Staff Shift Score

Facility _____ Zone _____

Evaluator _____ Date _____

Staff Shift: From _____ To _____

WORKSHEET 6.8.6 STAFF RESPONSE AND TRAINING

	Yes	No
A protection plan has been promulgated and all staff members considered in this rating have been trained in its implementation. *(See 6.5.2.1.)*		
The total available staff at any given time is able to handle the individual evacuation needs of each resident who is in the facility. *(See 6.5.2.2.)*		
Every staff member considered in this rating can meaningfully participate in the evacuation of every resident. *(See 6.5.2.3.)*		
All staff members considered in this rating are required to be in the facility when on duty, except as permitted. *(See 6.5.2.4.)*		
At least 12 fire drills were conducted during the previous year. *(See 6.5.2.5.)*		

All items must score "Yes" before proceeding.

WORKSHEET 6.8.7 PROMPTNESS OF RESPONSE SCORES

	Alarm Effectiveness	
Staff Availablility	Assured	Not Assured
Standby or asleep	16	2
Immediately available	20	2
Immediately available and close by	20	10

WORKSHEET 6.8.8 STAFF SHIFT SCORES

Staff Name	Promptness of Response Score	Staff Name	Promptness of Response Score
Staff Shift Score Total		Staff Shift Score Total	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

FIGURE 6.8 ***Continued***

WORKSHEET 6.8.9 RATING THE FACILITY

	Vertical Distance from Sleeping Rooms to Exits		
	All SR on Floors with Direct Exit	Any SR One Floor from Exit	Any SR Two or More Floors from Exit
Small Facility[a]	◯ Score 0.8	◯ Score 1.0	◯ Score 1.2
Large Facility or Apartment[b]		◯ Score 1.0	

[a] Small facilities have 16 or fewer residents.
[b] See 6.6.6 for apartments.

WORKSHEET 6.8.10 CALCULATION OF EVACUATION CAPABILITY SCORE

Total Resident Evacuation Assistance Score (Worksheet 6.8.4) ☐ X Vertical Distance from Sleeping Room to Exit (Worksheet 6.8.9) ☐

☐ = Evacuation Capability Score ☐

Staff Shift Score (Worksheet 6.8.8)

(go to Worksheet 6.8.11)

WORKSHEET 6.8.11 EVACUATION CAPABILITY SCORE

Evacuation Capability Score	Level of Evacuation Capability	Evacuation Capability for this Facility or Zone
≤1.5	Prompt	
>1.5 to ≤5.0	Slow	
>5.0	Impractical	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

FIGURE 6.8 *Continued*

▲ Chapter 7 Fire Safety Evaluation System for Board and Care Occupancies

7.1 Introduction.

▲ **7.1.1** This chapter is part of an NFPA guide and, therefore, is not mandatory. The term *shall* in this chapter is used to indicate that if the provisions of the chapter are applied, the procedures mandated are to be followed to ensure the effectiveness of the evaluation system.

▲ **7.1.2** Chapter 33 (NFPA *101*) defines three levels of evacuation capability for residents (with staff assistance): *prompt*, *slow*, and *impractical*. Chapter 33 (NFPA *101*) also prescribes the fire safety protection requirements for each level of evacuation capability. This chapter describes a procedure for determining whether a combination of fire safety features in a board and care facility provides a level of safety equivalent to that provided by explicit conformance to Chapters 32 and 33 (NFPA *101*). The definition of evacuation capability is given in 3.3.76 (NFPA *101*), and one procedure for determining evacuation capability is presented in Chapter 6 of this document.

7.1.3 Subsystems are provided as follows:

(1) Section 7.2 — Evaluating the fire safety protection in a small facility
(2) Section 7.4 — Evaluating the fire safety protection in a large facility
(3) Section 7.6 — Evaluating the suitability of an apartment building to house a board and care occupancy

▲ 7.2 Glossary for Fire Safety Evaluation Worksheet for a Small Facility.

▲ **7.2.1 Introduction.** This glossary is provided to assist in completing Figure 7.3, Worksheets for Evaluating Fire Safety for a Small Facility, to determine the suitability of a small facility to house a board and care occupancy. The instructions for the mechanisms of completing the worksheet are included in Section 7.3. They are not repeated in this glossary. This glossary provides expanded discussion and definitions for the various items in the worksheet to assist the user where questions of definition or interpretation arise. To the maximum extent possible, the glossary does not repeat the definitions already existing in NFPA *101*, *Life Safety Code*, but rather references the appropriate paragraphs in NFPA *101*.

7.2.2 Areas of Application.

▲ **7.2.2.1** The evaluation shall be completed covering the entire home, including spaces that are not used by the residents of the board and care home. See Worksheet 7.3.2. Row houses, townhouses, or other forms of independent living units having all of their entrances and means of escape completely separate from any other unit shall be permitted to be calculated as small facilities where they are separated from any abutting living units. Such separation shall be by fire-resistive partitions or walls having at least a 1-hour fire resistance rating and extending to the roof if it is noncombustible, or through the roof if the roof or its covering is of combustible material.

7.2.2.2 For dwelling units (apartments) in general-use apartment houses, the worksheet shall be used to evaluate the dwelling unit being used as the board and care home. The remainder of the apartment building shall be evaluated using the worksheet to determine the suitability of apartment buildings to house a board and care occupancy.

▲ **7.2.3 Maintenance.** All protection systems, requirements, arrangements, and procedures shall be maintained in a dependable operating condition and a sufficient state of readiness and shall be used in such a manner that the intended safety function or hazard constraint is not impaired. Otherwise, they shall receive no credit in the evaluation.

7.2.4 Safety Parameters (Worksheet 7.3.2). The safety parameters are a measure of those building factors that bear upon or contribute to the safety of those persons who might be in the building at the time of a fire. Each of the safety parameters is to be analyzed, and the safety value for each parameter that best describes the condition in the building is to be identified. Only one value for each of the parameters is to be chosen. If two or more values appear to apply, the one with the lowest point value shall be used.

▲ **7.2.4.1 Construction/Fire Resistance.** Construction types are as defined in 7.2.4.1.1 and 7.2.4.1.2, except that sprinkler protection shall not be considered in determining construction classification in any case where credit is given for sprinkler protection as defined in 7.2.4.5.

7.2.4.1.1 Protected (15 minutes). Buildings meeting the requirements of 33.2.1.3.2 (NFPA *101*).

7.2.4.1.2 Protected (1 hour). Buildings meeting the requirements of Type I, Type II(222), Type II(111), Type III(211), Type IV, or Type V(111) construction.

▲ **7.2.4.2 Hazardous Areas.** The assignment of parameter values for hazardous areas is a four-step process.

7.2.4.2.1 Step 1 — Identify Hazardous Areas. Hazardous areas are as defined in 32.2.3.2 and 33.2.3.2 (NFPA *101*).

7.2.4.2.2 Step 2 — Determine the Area Exposed.

7.2.4.2.2.1 Primary Means of Escape. Hazardous area is on the same floor as and is in or abuts a primary means of escape, as defined in 32.2.3.2 and 33.2.3.2 (NFPA *101*).

7.2.4.2.2.2 Sleeping Area. Hazardous area is on the same floor as and is in or abuts the sleeping area (room).

7.2.4.2.3 Step 3 — Determine the Fire Protection Provided.

7.2.4.2.3.1 Sprinkler Protection. The hazardous area is protected by sprinklers (or other appropriate automatic extinguishing system).

7.2.4.2.3.2 Smoke-Resisting Separation. The hazardous area is separated from exposed sleeping areas and the primary means of escape routes by a separation that resists the passage of smoke. Any doors in such separation are self-closing or automatic-closing upon detection of smoke.

7.2.4.2.3.3 Half-Hour Fire Resistance–Rated Enclosure. Enclosures meeting the requirements of 32.2.3.2.5(1) and 33.2.3.2.5(1) (NFPA *101*).

7.2.4.2.3.4 1-Hour Fire Resistance–Rated Enclosure. Enclosures meeting the requirements of 32.2.3.2.4(1) and 33.2.3.2.4(1) (NFPA *101*).

7.2.4.2.4 Step 4 — Determine Degree of Deficiency and Assign Parameter Values. The parameter value ultimately is determined on the basis of the area exposed and the level of protection provided. Table 7.2.4.2.4 provides a matrix for determining the degree of deficiency to be assessed. In some situations, more than one hazardous area with the same or differing levels of deficiency exists. The parameter value then

Table 7.2.4.2.4 Hazardous Areas — Degree of Deficiency

	Nonsprinklered			Sprinklered	
	Fire resistance rating with automatic fire detection				
	½ hour	1 hour	Unenclosed	Smoke-resistive separation	Unenclosed
Does not expose sleeping area or means of escape routes	No deficiency	No deficiency	Single deficiency	No deficiency	No deficiency
Exposes sleeping area or means of escape routes	Single deficiency	No deficiency	Double deficiency	No deficiency	No deficiency

is based on the single most serious deficiency for the hazardous area.

▲ **7.2.4.3 Manual Fire Alarm.** Manual fire alarms are defined in 7.2.4.3.1 through 7.2.4.3.3.

7.2.4.3.1 None or Incomplete. There is no manual fire alarm system, or the system is incomplete and does not meet the requirements necessary for a higher-scored category.

7.2.4.3.2 Without Fire Department Notification (W/O F.D. Notification). The credit for this level of protection is to be given for any installation that meets the requirements for a manual fire alarm system in 32.2.3.4.1 and 33.2.3.4.1 (NFPA *101*).

7.2.4.3.3 With Fire Department Notification (W/ F.D. Notification). There is a manual fire alarm system meeting the requirements of Section 9.6 (NFPA *101*), including fire department notification as defined in 9.6.4 (NFPA *101*).

▲ **7.2.4.4 Smoke Detection and Alarm.** A detection system as used herein is one based on the use of smoke detectors. No recognition is given for thermal detectors. The detection system categories are described in 7.2.4.4.1 through 7.2.4.4.5.

7.2.4.4.1 None or Incomplete. There are no smoke detectors in the building, or, if any are present, they do not meet the requirements for a higher-scored category.

7.2.4.4.2 Single-Level Detection, Limited Warning. There are one or more detectors in the building, but they do not meet the criteria for every level detection set forth in 7.2.4.4.3. Detectors credited in this category shall be permitted to be any approved smoke detector, including a single-station detector. At least one detector must be located in the corridor or similar common space (lobbies, lounges, or other spaces that cannot be closed off) in the immediate vicinity of each separate sleeping area. If there is more than one sleeping area, each such area must be protected to obtain this credit.

7.2.4.4.3 Every Level Detection. This credit applies where the detector system meets the requirements of 32.2.3.4.3 and 33.2.3.4.3 (NFPA *101*).

7.2.4.4.4 Every Level Plus Single-Station Detection in Each Bedroom. To receive this credit, the requirements of 7.2.4.4.3 must be met in full with the addition of at least one single-station detector in each bedroom or other sleeping area.

7.2.4.4.5 Total Coverage System. This system provides a minimum of one detector in each occupied room or other habitable space and throughout any basements, storage areas (other than normal clothing closets), or combustible loft spaces. To qualify as a total system, there must be a manual fire alarm system in the building, and the operation of any smoke detector must automatically activate the manual fire alarm system evacuation alarm for the entire building.

▲ **7.2.4.5 Automatic Sprinklers.** Automatic sprinklers are defined in 7.2.4.5.1 and 7.2.4.5.2.

7.2.4.5.1 Nonsprinklered. No credit is given if there are no sprinklers or if sprinklers, though present, are not sufficient to qualify for the sprinklered category.

7.2.4.5.2 Sprinklered ("Standard Sprinklers" or "Quick-Response or Residential Sprinklers"). The building is sprinklered in accordance with 32.2.3.5.1 through 32.2.3.5.7 and 33.2.3.5.2 through 33.2.3.5.7 (NFPA *101*).

▲ **7.2.4.6 Interior Finish.** Except as noted in 7.2.4.6.1, classification of interior finish on the walls and ceilings of the occupied space is in accordance with Section 10.2 (NFPA *101*). There are no requirements for interior floor finish. Choose the safety parameter value in Worksheet 7.3.2 based on the interior finish material provided. For example, if the interior wall finish material has a flame spread rating of between 25 and 75, do not take the parameter value associated with a flame spread rating of less than 25, regardless of the presence of automatic sprinkler protection. The mandatory values have been calibrated to take into consideration any sprinkler protection provided.

7.2.4.6.1 Interior wall and ceiling finish materials tested in accordance with NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, or NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, as permitted by Section 10.2 (NFPA *101*), and meeting the criteria established in Section 10.2 (NFPA *101*) for those test standards, shall be scored as Class A interior finish materials (flame spread ≤25).

7.2.4.6.2 No consideration is included in the safety parameter value for any finish with a flame spread rating greater than 200 or for any material not rationally measured by ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*. Materials not rationally measured include foam plastics, asphalt-impregnated paper, or other materials capable of inducing extreme rates of fire growth and rapid flashover. In any case involving these materials, the resultant risk is considered beyond the capacity of this evaluation system and requires individual appraisal. The following should be noted:

(1) Plywood of ¼ in. (6 mm) or greater thickness should be considered as having a flame-spread rating of ≤200.
(2) Exposed wood open-joist construction or other exposed wood construction areas shall be charged as Class C interior finish, in addition to any charges under 7.2.4.1.
(3) If a space is classified as hazardous under 7.2.4.2, no additional charge shall be made as the result of interior finish in such areas.

▲ **7.2.4.7 Separation of Sleeping Rooms (from Other Levels and from Corridors).** Separation of sleeping rooms is described in 7.2.4.7.1 through 7.2.4.7.3.

7.2.4.7.1 Separation of Sleeping Rooms from Other Levels. The classification of separation of sleeping rooms is categorized under the groups headed "Unprotected Vertical Openings" and "Protected Vertical Openings" (Parameter 7 in Worksheet 7.3.2). Determine the extent of vertical openings and number of stories connected.

7.2.4.7.1.1 Use the category of "Protected Vertical Openings" if any of the following apply:

(1) Single-story building without basement
(2) All vertical openings, other than a two-story open stair in sprinklered building, protected by ½-hour or greater fire resistance–rated smoke partition
(3) All vertical openings, other than a three-story open stair in sprinklered building where primary means of escape from each sleeping area does not require occupants to pass through floor on lower level, protected by ½-hour or greater fire resistance–rated smoke partition
(4) All vertical openings protected by ½-hour or greater fire resistance–rated smoke partition

7.2.4.7.1.2 Where none of the conditions in 7.2.4.7.1.1 apply, use the category of "Unprotected Vertical Openings."

7.2.4.7.2 Separation of Sleeping Rooms from Corridors and Common Spaces. The charge for "None or Incomplete" (Parameter 7 in Worksheet 7.3.2) is assessed in any case where the separation of sleeping rooms from corridors and common spaces is insufficient to meet any of the other classifications in this parameter.

7.2.4.7.3 Criteria for the Other Classifications of Sleeping Room Separation.

7.2.4.7.3.1 Smoke Resisting. Sleeping rooms are separated from corridors or other common spaces in accordance with 32.2.3.6 and 33.2.3.6 (NFPA *101*) without the door closer.

7.2.4.7.3.2 Smoke Resisting with Door Closer. Sleeping rooms are separated in accordance with 32.2.3.6 and 33.2.3.6 (NFPA *101*) with door closer.

7.2.4.7.3.3 Half-Hour Fire Resistance. Meets the requirements of 32.2.3.6 and 33.2.3.6 (NFPA *101*) without the door closer.

7.2.4.7.3.4 Half-Hour Fire Resistance with Door Closer. Sleeping rooms are separated in accordance with 32.2.3.6 and 33.2.3.6 (NFPA *101*) with door closer.

7.2.4.7.3.5 Half-Hour Fire Resistance with Automatic-Closing Doors. Automatic-closing doors shall be permitted if the doors have an arrangement that holds them open in a manner such that they are released by a smoke detector–operated device (e.g., magnetic or pneumatic hold-open device) prior to the passage of significant smoke from the space of fire origin into the corridor or from the corridor into the protected room. Smoke detectors for operation of such doors are either integral with the door closers, mounted at each door, or operated from a total smoke detection system covering both the room and corridor.

▲ **7.2.4.8 Means of Escape.** Means of escape is defined in 7.2.4.8.1 through 7.2.4.8.6.

7.2.4.8.1 Means of Escape on All Sleeping Levels. A building shall be considered as having means of escape on all sleeping levels, provided the following conditions exist:

(1) The entire building is on a single level.
(2) All guest rooms used for sleeping are on a level having an exit door.

7.2.4.8.2 Primary Route. A normal means of escape that might involve interior or exterior stairs, corridors, doors, or other common means of movement through and out of a dwelling unit.

7.2.4.8.2.1 Protected. A primary route is classed as "protected" if it provides a path of travel to the outside of the building without traversing any corridor or space exposed to an unprotected vertical opening. Also, where the sleeping room is above or below the level of exit discharge, the primary means is an enclosed interior stair in accordance with 32.2.2.4 or 33.2.2.4 (NFPA *101*), an exterior stair, or a horizontal exit.

7.2.4.8.2.2 Unprotected. A primary route is classed as "unprotected" if it does not meet the requirements for "protected."

7.2.4.8.3 Fewer Than Two Remote Routes. The egress capability is classed as "<2 remote routes" if each bedroom does not have access to two routes leading to two separate building exit doorways.

7.2.4.8.4 With Alternative Means. The credit for this level of protection applies to any facility that meets the requirements for a second means of escape in 32.2.2.3 and 33.2.2.3 (NFPA *101*).

7.2.4.8.5 Two Remote Routes. To meet the requirement for "two remote routes," each bedroom must have access to two routes leading to two separate building exit doorways.

7.2.4.8.5.1 Separated. To meet the requirement for "two remote routes separated," the facility must meet the requirements of 32.2.2.2 through 32.2.2.3 and 33.2.2.1 (NFPA *101*).

7.2.4.8.5.2 Unseparated. The two remote routes do not meet the requirements for the classification "separated."

7.2.4.8.6 Direct Exit from Each Bedroom.

7.2.4.8.6.1 To be credited, each bedroom must have a door that is operable by the room occupant(s) and such door opens directly to grade without more than one step, opens

directly to a ramp to grade, or opens directly to an external porch or landing with external stairs or other suitable access to grade.

7.2.4.8.6.2 Some buildings have a nonsleeping occupants use area (e.g., staff lounge) on a floor without any exit, and the building otherwise qualifies to receive credit for direct exits or for two remote exits. To receive credit for direct exits or for two remote exits, there must be either a protected egress route or two remote routes from the occupants use area.

▲ **7.3 Worksheets for Evaluating Fire Safety for a Small Facility.** A small facility is normally one with a capacity for 16 or fewer residents. For each individual residence or apartment used as a small board and care facility, the seven-step process in Figure 7.3 should be followed when evaluating fire safety.

▲ **7.3.1 Step 1 — Complete Cover Sheet Using Worksheet 7.3.1.** See Figure 7.3.

▲ **7.3.2 Step 2 — Determine Safety Parameter Values Using Worksheet 7.3.2.** Select and circle the safety value for each safety parameter in Worksheet 7.3.2 that best describes the conditions in the facility. Choose only one value for each of the eight parameters. If two or more values appear to apply, choose the one with the lowest point value.

▲ **7.3.3 Step 3 — Complete Individual Safety Evaluation Using Worksheet 7.3.3.** The following steps should be taken:

(1) Transfer each of the eight circled safety parameter values from Worksheet 7.3.2 to every available block in the line with the corresponding safety parameter in Worksheet 7.3.3. Where the block is marked "÷ 2 =," enter one-half the value from Worksheet 7.3.2.
(2) Add each of the four columns, keeping in mind that any negative numbers need to be deducted.
(3) Transfer the resulting values for S_1, S_2, S_3, and S_4 to the corresponding blocks in Worksheet 7.3.5.

▲ **7.3.4 Step 4 — Determine Mandatory Requirements Using Worksheet 7.3.4A or 7.3.4B as appropriate.** The following steps should be taken:

(1) Select the level of requirements from Worksheet 7.3.4A or 7.3.4B as appropriate. Circle the appropriate values.
(2) Transfer the circled values from Worksheet 7.3.4A or 7.3.4B to the corresponding blocks for S_a, S_b, S_c, and S_d in Worksheet 7.3.5.

▲ **7.3.5 Step 5 — Determine the Equivalency Evaluation.** The following steps should be taken:

(1) Perform the subtractions indicated in Worksheet 7.3.5. Enter the differences in the appropriate answer blocks.
(2) For each row, check "yes" if the value in the answer block is zero (0) or greater. Check "no" if the value in the answer block is a negative number.

▲ **7.3.6 Step 6 — Evaluate Other Considerations Not Previously Addressed, Using Worksheet 7.3.6.** The equivalency covered by Worksheets 7.3.2 through 7.3.5 includes the majority of the considerations covered by the *Life Safety Code*. Some considerations are not evaluated by this method and must be considered separately. These additional considerations are covered in Worksheet 7.3.6, Facility Fire Safety Requirements Worksheet. Complete one copy of this separate worksheet for each facility.

▲ **7.3.7 Step 7 — Determine Equivalency Conclusion.** Conclude whether the level of life safety is at least equivalent to that prescribed by the *Life Safety Code*, using Worksheet 7.3.7, Conclusions. Worksheet 7.3.7 combines the zone fire safety equivalency evaluation of Worksheet 7.3.5 and the additional considerations of Worksheet 7.3.6.

▲ **7.4 Glossary for Fire Safety Evaluation Worksheet for a Large Facility.**

▲ **7.4.1 Introduction.** This glossary is provided to assist in completing the "Fire Safety Evaluation Worksheet for a Large Facility" to determine the suitability of a large facility to house a board and care occupancy. The instructions for the mechanisms of completing the worksheet are included in Section 7.5. They are not repeated in this glossary. This glossary provides expanded discussion and definitions for the various items in the worksheet to assist the user where questions of definition or interpretation arise. To the maximum extent possible, the glossary does not repeat the definitions already existing in NFPA *101*, *Life Safety Code*, but rather references the appropriate paragraphs in NFPA *101*.

7.4.2 Areas of Application.

▲ **7.4.2.1** The entire residence is evaluated on one set of worksheets to the degree indicated by each item on the worksheets. See Worksheets 7.5.1 through 7.5.7. However, spaces that are not used for living units, not in direct utility or maintenance support of the living units, not provided for resident use, or not in any way involved in resident emergency egress shall be permitted to be omitted from the calculation where such space is separated from all of the resident spaces and resident-support spaces by 2-hour fire resistance–rated construction (including any building members that support the resident areas and emergency egress routes). In such a case, however, any appropriate charges under Safety Parameter 2, "Hazardous Areas," in Worksheet 7.5.2 shall be charged. Also, the assignment of values for Safety Parameter 3, "Manual Fire Alarm"; Safety Parameter 7, "Exit System"; and Safety Parameter 8, "Exit Access," shall not consider conditions in unoccupied spaces that do not involve any egress paths.

7.4.2.2 Note that zoning of buildings shall be permitted, and individual zones shall be permitted to have different safety values (levels). Such zoning shall, however, be limited to considerations of differences in Safety Parameters 6, 7, and 8, which cover exits and separation of sleeping areas. Zoning shall be by separate fire/smoke zones. A fire/smoke zone is a portion of the building separated from all other portions of the building by building construction having at least a 1-hour fire resistance rating or smoke barriers, or both, conforming to the requirements of Section 8.5 of NFPA *101*, *Life Safety Code*, using smoke barriers of at least a ½-hour fire resistance rating. Zoning of the facility also shall be permitted in non–fire-resistive sprinklered buildings, provided the construction separating one zone from another is sound- and smoke-resistant.

▲ **7.4.3 Maintenance.** All protection systems, requirements, arrangements, and procedures shall be maintained in a dependable operating condition, and a sufficient state of readiness, and shall be used in such a manner that the intended safety function or hazard constraint is not impaired. Otherwise, they shall receive no credit in the evaluation.

WORKSHEET 7.3.1 COVER SHEET

Fire Safety Evaluation Worksheet for a Small Board and Care Facility

Facility Identification _____

Evaluator _____ Date _____

▲ WORKSHEET 7.3.2 SAFETY PARAMETER VALUES — SMALL FACILITY

Safety Parameters		Parameter Values								
1. Construction/ Fire Resistance		Exposed Structural Members			Protected 15 min			Protected 1 hr		
		0			1			3		
2. Hazardous Areas		Double Deficiency			Single Deficiency			None or No Deficiency		
		−7			−4			0		
3. Manual Fire Alarm		None or Incomplete			W/O F.D. Notification			W/ F.D. Notification		
		0			1			2		
4. Smoke Detection and Alarm		None or Incomplete	Single Lev. Det./ Limited Warning		Warning to All Bedrooms: Every Lev. Det.[e]		Warning to All Bedrooms: Every Lev. Plus Det. in Each Bdrm.	Total Coverage System		
		−4	0		2		3(4)[f]	4		
5. Automatic Sprinklers		Nonsprinklered			Standard Sprinklers			Quick-Response or Residential Sprinklers		
		0			8			10		
6. Interior Finish		Flame-Spread Ratings								
		>75 to ≤200			>25 to ≤75			≤25		
		−3			−1			0		
7. Separation of Sleeping Rooms (from other levels and from corridors)		Unprotected Vertical Openings			Protected Vertical Openings[d]					
		None or Incomp.	Smoke Resisting W/O Closers	Smoke Resisting W/ Closers	None or Incomp.	Smoke Resisting	½ hr	½ hr Auto-Closing	Smoke Res. W/ Door Closer	½ hr W/ Door Closer
		−6	−4	0(0)[c]	−2	0	1(0)[a]	2(0)[a]	1	2(1)[a]
8. Means of Escape	Means of Escape on All Sleeping Levels	<2 Remote Routes: W/O Alt. Means	<2 Remote Routes: W/ Alt. Means		2 Remote Routes Unseparated		2 Remote Routes Separated	Direct Exit from Each Bdrm.		
		−1	0		1(0)[b]		2(0)[b]	3(0)[b]		
	Means of Escape Not on All Sleeping Levels	Primary Route Not Protected: <2 Remote Routes: W/O Alt. Means	Primary Route Not Protected: <2 Remote Routes: W/ Alt. Means	Primary Route Not Protected: 2 Remote Routes	Primary Route Protected: <2 Remote Routes: W/O Alt. Means	Primary Route Protected: <2 Remote Routes: W/ Alt. Means	Primary Route Protected: 2 Remote Routes			
		−4	−3	0	−1	0	2(0)[b]			

[a] Use ( ) if Parameter 1 is 0 and Parameter 5 is 0.
[b] Use (0) if Parameter 7 is based on a "none or incomplete" situation.
[c] Use (0) if door is 20-minute and has automatic closer.
[d] Consider a single-level building as having protected vertical openings.
[e] Every level detection is permitted to be omitted with quick-response automatic sprinklers throughout; however, detection in each bedroom is required.
[f] Use (4) in existing buildings if detection in each bedroom and quick-response automatic sprinklers throughout.

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Small) (p. 1 of 3)

FIGURE 7.3 Worksheets for Evaluating Fire Safety in a Small Facility.

WORKSHEET 7.3.3 INDIVIDUAL SAFETY EVALUATIONS — SMALL FACILITY

Parameters	Fire Control (S_1)	Egress (S_2)	Refuge (S_3)	General Fire Safety (S_4)
1. Construction				
2. Hazardous Areas		÷ 2 =		
3. Manual Fire Alarm	÷ 2 =	*(See note.)*		
4. Smoke Detection and Alarm	÷ 2 =		÷ 2 =	
5. Automatic Sprinklers		÷ 2 =		
6. Interior Finish	÷ 2 =			
7. Separation of Sleeping Rooms				
8. Means of Escape				
Total	S_1 =	S_2 =	S_3 =	S_4 =

NOTE: Maximum value of manual fire alarm for means of escape is 1.

WORKSHEET 7.3.4A MANDATORY SAFETY REQUIREMENTS — NEW SMALL FACILITY

Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
10.5	5	11.5	7

WORKSHEET 7.3.4B MANDATORY SAFETY REQUIREMENTS — EXISTING SMALL FACILITY

Level of Evacuation Difficulty	Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
Prompt	0	4	2	1
Slow	2	7	4	7
Slow*	1	6	2	5
Impractical	8	9	9	10

*Use these mandatory safety requirements if evacuation time is 8 minutes or less or if the evacuation capability score is 3 or less as determined by Chapter 6.

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Small) (p. 2 of 3)

FIGURE 7.3 *Continued*

WORKSHEET 7.3.5 EQUIVALENCY EVALUATION

						Yes	No
Control Provided (S_1)	minus	Required Control (S_a)	≥	0	S_1 ☐ − S_a ☐ = ☐		
Egress Provided (S_2)	minus	Required Egress (S_b)	≥	0	S_2 ☐ − S_b ☐ = ☐		
Refuge Provided (S_3)	minus	Required Refuge (S_c)	≥	0	S_3 ☐ − S_c ☐ = ☐		
General Fire Safety (S_4)	minus	Required Gen. Fire Safety (S_d)	≥	0	S_4 ☐ − S_d ☐ = ☐		

WORKSHEET 7.3.6 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

Considerations	Met	Not Met
Complies with the applicable requirements of Sections 32.7 and 33.7 (NFPA *101*).		

WORKSHEET 7.3.7 CONCLUSIONS

1. ☐ All of the checks in Worksheet 7.3.5 are in the "Yes" column and all applicable considerations in Worksheet 7.3.6 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for small residential board and care occupancies.
2. ☐ All of the checks in Worksheet 7.3.5 are in the "Yes" column and all considerations identified in Worksheet 7.3.6 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for small residential board and care occupancies.
3. ☐ One or more of the checks in Worksheet 7.3.5 are in the "No" column or any consideration identified in Worksheet 7.3.6 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for small residential board and care occupancies.

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Small) (p. 3 of 3)

FIGURE 7.3 ***Continued***

7.4.4 Safety Parameters (Worksheet 7.5.2). The safety parameters are a measure of those building factors that bear on or contribute to the safety of those persons who might be in the building at the time of a fire. Each of the safety parameters is to be analyzed, and the safety value for each parameter that best describes the condition in the building is to be identified. Only one value for each of the parameters is to be chosen. If two or more values appear to apply, the one with the lowest point value shall be used.

▲ **7.4.4.1 Construction.**

7.4.4.1.1 Number of stories in height is defined in 4.6.3 (NFPA *101*).

7.4.4.1.2 Where the facility includes additions or connected structures of different construction, the rating and classification of the structure shall be based on the following:

(1) Separate buildings where a 2-hour or greater fire resistance–rated separation exists between the portions of the building
(2) The lower safety parameter point score involved where such a separation does not exist

7.4.4.1.3 The safety parameter values for Type V(000), Type III(200), and Type II(000) receive a higher parameter credit if the building is fully sheathed. This credit is to be given if all portions of the bearing walls, bearing partitions, floor construction, and roofs [or a roof/loft system if the space above the highest ceiling is inaccessible and either is provided with draft stops or other barriers on 30 ft (9.1 m) spacing or is provided with heat- or smoke-actuated fire detectors that sound the building fire alarm], and all columns, beams, girders, trusses, or similar bearing members either have an inherent fire resistance or are sheathed, encased, or otherwise treated to provide approximately a ½-hour or greater fire resistance rating. Buildings fully sheathed with sound lath and plaster, gypsum board, or equivalent sheathing are considered as meeting these criteria.

▲ **7.4.4.2 Hazardous Areas.** The assignment of parameter values for hazardous areas is a four-step process.

▲ **7.4.4.2.1 Step 1 — Identify Hazardous Areas.** Hazardous areas are those having a degree of hazard greater than that normal to the general occupancy of the building, such as areas for storage of combustibles or flammables, for heat-producing appliances, or for maintenance purposes.

▲ **7.4.4.2.2 Step 2 — Determine the Level of Hazard.**

7.4.4.2.2.1 There are two levels of hazard: structurally endangering and not structurally endangering.

(A) Structurally Endangering. A hazardous occupancy with sufficient fire or explosion potential to defeat the basic integrity of the building framing as defined in 7.4.4.1.

(B) Not Structurally Endangering. A hazardous occupancy with sufficient fire potential to build to full involvement and present a danger of propagating through openings or wall partitions but not possessing sufficient total potential to endanger the structural framing or floor decking as defined in 7.4.4.1.

7.4.4.2.2.2 Table 7.4.4.2.2.2 provides an analysis of typical types of hazardous areas relative to inherent potential structural danger to different classes of structural systems.

▲ **7.4.4.2.3 Step 3 — Determine the Fire Protection Provided.**

7.4.4.2.3.1 The parameter value for hazardous areas is based on the presence or absence of the fire protection necessary to control or confine the hazard. Two different types of fire protection are considered. The first consists of automatic sprinklers or other appropriate extinguishing systems covering the entire hazard. The second is a complete fire resistance–rated enclosure, including the separation of the hazardous area from any bearing members, partitions separating the hazardous area from all other spaces, and doors to the space sufficient to exceed the potential of the fire load involved. Any hazardous space that has either of these protection systems is classed as having single protection. Any hazardous space that is both fully enclosed — as described above— and sprinklered is classed as having both (i.e., double-level protection). On

Table 7.4.4.2.2.2 Hazardous Areas — Level of Hazard

Large Facility — Inherent Structural Danger from Typical Hazardous Areas			
Exposure (area, space, activity, condition)	**Minimum Fire Resistance Rating of Bearing Walls, Bearing Partitions, Columns, Beams, Girders, Trusses, and Floor/Ceiling Assemblies Exposed to Hazardous Area**		
	≥2 hours	**≥1 hour to <2 hours**	**<1 hour**
Occupational therapy space	N/SE	Varies*	SE
Craft shop	N/SE	Varies*	SE
General storage area	N/SE	Varies*	SE
Garage	N/SE	N/SE	SE
Boiler, heater, or incinerator rooms	N/SE	Varies*	SE
Fuel storage	N/SE	SE	SE
Trash chutes	N/SE	SE	SE
Trash rooms	N/SE	SE	SE
Small trash collection room	N/SE	N/SE	SE
Laundries (institutional type)	N/SE	N/SE	SE
Repair shops	N/SE	Varies*	SE

N/SE: not structurally endangering. SE: structurally endangering.
*Must be judged on the combustibles involved in the individual situation.

this basis, any hazardous area with a fuel load that has the potential of overwhelming the available structural capability could, as a minimum, have a single deficiency as determined in 7.4.4.2.4.

7.4.4.2.3.2 Note that where the hazardous area is within a living unit or abuts an egress route (exit or exit access) addressed in 7.4.4.7 and 7.4.4.8, the credit for sprinklers shall not be permitted unless the hazardous area is separated from the rest of the living unit or the egress route by reasonably smoke-resisting barriers and doors.

▲ **7.4.4.2.4 Step 4 — Determine Degree of Deficiency and Assign Parameter Values.** The parameter value ultimately is determined by the degree of the deficiency of the hazardous area based on the level of protection needed. Table 7.4.4.2.4 provides a matrix to be used for determining the degree of deficiency to be assessed. In some situations, more than one hazardous area with the same or differing levels of deficiency exists. The overall parameter value then is based on the single most serious deficiency for the hazardous area.

▲ **7.4.4.3 Manual Fire Alarm.** Fire alarms are defined in 7.4.4.3.1 through 7.4.4.3.3.

7.4.4.3.1 None or Incomplete. There is no fire alarm system, or the system is incomplete and does not meet the requirements for a higher-scored category.

7.4.4.3.2 Without Fire Department Notification (W/O F.D. Notification). There is a fire alarm system that meets the requirements of 32.3.3.4 and 33.3.3.4 (NFPA *101*), as appropriate.

7.4.4.3.3 With Fire Department Notification (W/ F.D. Notification). There is a fire alarm system that complies with 7.4.4.3.2 and automatically transmits a signal to the fire department in accordance with 9.6.4 (NFPA *101*).

▲ **7.4.4.4 Smoke Detection and Alarm.** All references to detectors herein refer to smoke detectors. No credit is given for thermal detectors in habitable spaces except as specifically noted. Heat detectors can be credited in uninhabitable spaces where ambient temperatures can be expected to exceed 120°F (50°C) or fall below 0°F (–18°C) (such as in unfinished attics or cocklofts), provided separation from inhabited spaces is at least ½-hour fire resistance–rated. The categories under this parameter are described in 7.4.4.4.1 through 7.4.4.4.4.

7.4.4.4.1 None or Incomplete. There are no detectors, or those that are present do not meet the requirements for a higher-scored category.

7.4.4.4.2 Single-Station Units in Each Bedroom. There is one single-station detector (sounds the alarm only at the responding detector) in each bedroom or sleeping room.

7.4.4.4.3 Interconnected System. Interconnected systems are those systems where the operation of any detector sounds alarm devices that alert all of the occupants. The alarm sounding device shall be permitted to be on other interconnected detectors or be other separate alarm devices. Where the systems are of the total building variety, the credit shall be permitted to be given only if the system includes manual fire alarm features or the building has a manual fire alarm system and the operation of the detection system sounds the manual fire alarm as though a fire alarm box on that floor had been operated.

7.4.4.4.3.1 Corridors and Common Spaces Without Bedroom/Suite Detectors. The system meets the requirements of 32.3.3.4.8 and 33.3.3.4.8 (NFPA *101*).

7.4.4.4.3.2 Corridors and Common Spaces with Single-Station Bedroom/Suite Detectors. There is one single-station detector in each bedroom or sleeping room and interconnected detectors in corridors and common spaces that are spaced as described in 7.4.4.4.3.1.

7.4.4.4.3.3 Corridors and Common Spaces with Interconnected Bedroom/Suite Detectors. The system is as in 7.4.4.4.3.2, except bedroom/suite detectors are interconnected with corridor/common space detectors. In buildings in which construction as specified in 7.4.4.1 is based on all members having a fire resistance rating of at least ½ hour or more, a system as described in 7.4.4.4.3.2 that also has a thermal detector in each bedroom/suite connected to the building fire alarm system shall be permitted to be credited in this category.

7.4.4.4.4 Total Building System. This system includes detectors located in every bedroom throughout the building and also provides detector coverage throughout all corridors, common spaces, and hazardous areas, with the system meeting the requirements for an automatic fire alarm system in accordance with *NFPA 72, National Fire Alarm and Signaling Code.*

▲ **7.4.4.5 Automatic Sprinklers.** Any sprinkler installation that meets the requirements of 32.3.3.5 and 33.3.3.5 (NFPA *101*).

7.4.4.5.1 None or Incomplete.

7.4.4.5.1.1 No credit is given if there are no sprinklers or if sprinklers, though present, are not sufficient to qualify for one of the other categories specified herein.

Table 7.4.4.2.4 Hazardous Areas — Degree of Deficiency

	No protection	Sprinkler protection	Fire resistance–rated enclosure	Sprinklered and fire resistance–rated enclosure
Not structurally endangering	Single deficiency	No deficiency		
Structurally endangering	Double deficiency	Single deficiency	No deficiency* Double deficiency†	No deficiency* Single deficiency†

*If fire resistance and structural strength exceed maximum potential of hazard.
†If fire resistance and structural strength are not sufficient to withstand potential of hazard.

7.4.4.5.1.2 Note that any space that is credited as being protected by automatic sprinklers and abuts a hazardous area judged deficient in accordance with 7.4.4.2 shall not be permitted to be considered as sprinkler protected unless the hazardous area also is sprinkler protected.

7.4.4.5.2 Bedrooms/Suites Only. All bedrooms/suites have sprinkler protection.

7.4.4.5.3 Corridors and Common Spaces. Sprinkler protection covers all of the corridors and public spaces that separate, directly expose, or are in the egress path from the bedrooms/suites (except fire resistance–rated, enclosed, noncombustible stairwells). Sprinklers shall be installed along the corridor ceiling, and, in addition, one sprinkler shall be installed opposite the center of and inside of any bedroom door opening onto the corridor.

7.4.4.5.4 Bedrooms/Suites, Corridors, and Common Spaces. Sprinkler protection meets the combined requirements for 7.4.4.5.2 and 7.4.4.5.3 and is equipped with an automatic alarm initiating device that activates the building manual fire alarm system or an alternate evacuation alarm.

7.4.4.5.5 Total Building. The building is totally sprinkler protected and is equipped with an automatic alarm initiating device that activates the building manual fire alarm system or an alternate evacuation alarm.

▲ **7.4.4.6 Separation of Sleeping Rooms from Exit Access.** Separation of sleeping rooms from exit access is based on the wall partitions that make up the separation and the protection of the openings in those partitions.

7.4.4.6.1 The charge for "None or Incomplete" (Safety Parameter 6 in Worksheet 7.5.2) is assessed in any case where the separation of sleeping rooms from exit access is insufficient to meet any of the other classifications in this parameter.

7.4.4.6.2 Criteria for "Expectation of Door Closing."

7.4.4.6.2.1 Expectation— Not High. This credit is given if the requirements for "expectation — high" are not met.

7.4.4.6.2.2 Expectation— High. High expectation of a door closing (or being closed at time of fire) shall be considered to be met if the requirements of 32.3.3.6.5 and 33.3.3.6.6 (NFPA *101*) are met.

7.4.4.6.3 Smoke Resisting. Sleeping rooms are separated from corridors or other common spaces by walls, partitions, or other constructions that resist the passage of smoke. There are no louvers, transfer grilles, operable transoms, or other air passages penetrating the wall except properly installed heating and utility installations. Doors, in walls or partitions that separate sleeping rooms from corridors or other common spaces, resist the passage of smoke and are provided with latches, door closers, or other mechanisms suitable for keeping the doors tightly closed. Vision panels shall be permitted to be installed in doors or partitions without respect to glass type or size.

7.4.4.6.4 Half-Hour. The credit is given if the requirements of 32.3.3.6.3 through 32.3.3.6.6 and 33.3.3.6.3 through 33.3.3.6.6 (NFPA *101*) are met.

7.4.4.6.5 1-Hour Walls, 20-Minute Doors. Sleeping rooms are separated from corridors or other common spaces by walls or partitions and doors meeting the requirements of 7.4.4.6.4, and the walls and partitions have at least a 1-hour fire resistance rating.

Exception: Where doors meet the requirements of 7.4.4.6.4 and automatic sprinklers are provided on both sides of the door.

▲ **7.4.4.7 Exit System.** Exit systems are the paths of travel from the facility to the outside. For the purposes of this parameter, however, only those exit routes used in fire drills in accordance with Sections 32.7 and 33.7 (NFPA *101*) shall be credited.

7.4.4.7.1 Exposed Route. An exit route is exposed if a segment of that route is the only available route for one or more residents and that segment of the exit route is not safeguarded by one of the following means:

(1) Separation from all other rooms or areas by walls and doors of equivalent separation to that credited in 7.4.4.6
(2) Protection of the other rooms or spaces by an automatic sprinkler system
(3) Protection of the other rooms or spaces by a smoke detection and alarm system connected to activate the building evacuation alarm; and where furnishings, finishes, and furniture, in combination with all other combustibles within the space, are of such minimum quantity and are so arranged that a fully developed fire is unlikely to occur

7.4.4.7.2 Multiple Routes. Multiple routes exist where the occupants of any sleeping room have, either from the sleeping room or through access in a corridor adjacent to the sleeping room, a choice of two separate exit routes to the outside.

7.4.4.7.3 Deficient. An exit route is deficient if it fails to meet any of the applicable criteria in 32.3.2 and 33.3.2 (NFPA *101*), except those related to travel distances and dead ends. These conditions are evaluated separately in 7.4.4.8.

7.4.4.7.4 Without Horizontal Exit (W/O Horiz. Exit). An egress system is based on this charge if there are multiple routes that are not deficient but the arrangement does not include a horizontal exit as defined in 7.4.4.7.5, or that have an acceptable direct exit from each sleeping room as defined in 7.4.4.7.7.

7.4.4.7.5 With Horizontal Exit (W/ Horiz. Exit). The presence of a single horizontal exit meeting the criteria in 7.2.4 (NFPA *101*) on each floor containing sleeping rooms shall be considered as sufficient criteria to meet this requirement, provided that the space created is of sufficient size to provide at least 3 ft^2 (0.28 m^2) of accessible space for all of the potential occupants already present in or evacuating to such space.

7.4.4.7.6 Smokeproof Enclosure. Credit for a smokeproof enclosure shall be permitted to be given for a stairway designed and tested in accordance with the requirements of 7.2.3 (NFPA *101*) for a smokeproof enclosure. To receive credit for a smokeproof enclosure, all exit stairs credited in Safety Parameter 7, "Exit System," and Safety Parameter 8, "Exit Access," of Worksheet 7.5.2 shall meet the smokeproof enclosure requirements.

7.4.4.7.7 Direct Exit.

7.4.4.7.7.1 To be credited for direct exits, each sleeping room shall have within that unit a door that opens to the exterior at grade level or onto an unenclosed exterior balcony with direct access to an exterior exit or smokeproof enclosure. Where such openings are directly onto grade in a location where any person egressing can move directly away from the building without further exposure, the credit for direct exit shall be permitted, even if there are no other exit routes from the involved living unit.

7.4.4.7.7.2 Note that this parameter value does not cover the charges for the dead-end conditions, travel distance, interior finish in the egress routes (exits or exit access), or enclosure of stairways or other exit routes that pass from floor to floor. These elements are covered separately in 7.4.4.8, 7.4.4.9, and 7.4.4.10.

▲ **7.4.4.8 Exit Access.** Exit access is a measurement of the travel distance from the sleeping rooms to the outside or to any other point of safety as defined in 3.3.211 (NFPA *101*), whichever is shorter.

▲ **7.4.4.9 Interior Finish.**

7.4.4.9.1 Classification of interior finish on walls and ceilings of the occupied space shall be in accordance with Section 10.2 (NFPA *101*). Choose the safety parameter value in Worksheet 7.5.2 based on the interior finish material provided. For example, if the interior wall finish material has a flame spread rating of between 25 and 75, do not take the parameter value associated with a flame spread rating of less than 25 regardless of the presence of automatic sprinkler protection. The mandatory values have been calibrated to take into consideration any sprinkler protection provided. Exposed portions of structural members complying with the requirements of Type IV(2HH) construction shall be permitted.

7.4.4.9.2 Interior wall and ceiling finish materials tested in accordance with NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, or NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, as permitted by Section 10.2 (NFPA *101*), and meeting the criteria established in Section 10.2 (NFPA *101*) for those test standards, shall be scored as Class A interior finish materials (flame spread ≤25).

7.4.4.9.3 Only floor coverings in the exit and exit access system are considered. For purposes of assigning the parameter values in Worksheet 7.5.2, such floor coverings are considered as having a flame spread ≤25 if they meet the requirements for Class I or Class II and as otherwise having a flame spread >75. Previously installed floor coverings shall be permitted, subject to the approval of the authority having jurisdiction.

7.4.4.9.4 No consideration is included in the safety parameter value for any finish with a flame-spread rating greater than 200 or for any material not rationally measured by ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*. Materials not rationally measured include foam plastics, asphalt-impregnated paper, or other materials capable of inducing extreme rates of fire growth and rapid flashover. In any case involving these materials, the resultant risk is considered beyond the capacity of this evaluation system and requires individual appraisal. Note that plywood of ¼ in. (6 mm) or greater thickness should be considered as having a flame-spread rating of ≤200.

▲ **7.4.4.10 Vertical Openings.**

7.4.4.10.1 These values apply to vertical openings and penetrations, including exit stairways, ramps, and any other vertical exits, pipe shafts, ventilation shafts, duct penetrations, and laundry and incinerator chutes. The charge for vertical openings shall be based on the presence or lack of enclosure and the fire resistance rating of the enclosure, if provided.

7.4.4.10.2 A vertical opening or penetration shall be classified as open, provided any of the following conditions apply:

(1) It is unenclosed.
(2) It is enclosed but does not have doors.
(3) It is enclosed but has openings other than doorways.
(4) It is enclosed with cloth, paper, or similar materials without any sustained firestopping capabilities, except as permitted by 32.3.3.1 and 33.3.3.1 (NFPA *101*), as appropriate.

7.4.4.10.3 If a shaft other than a credited exit route (i.e., credited as one of the multiple routes required in 7.4.4.7.2 or in determining travel distance in 7.4.4.8) is enclosed on all floors but one and this results in an unprotected opening between that shaft and one, and only one, floor, the parameter value assigned to that shaft shall be 0. If a required egress route is contained in that shaft, the parameter value shall be (–2).

▲ **7.4.4.11 Smoke Control.** Smoke control definitions are provided in 7.4.4.11.1 through 7.4.4.11.5.

7.4.4.11.1 None. There are no smoke barriers (or horizontal exits) on the floor, the floor is not served by a smokeproof enclosure, and there are no mechanically assisted smoke control systems serving the floor.

7.4.4.11.2 Smoke Barrier. Smoke barriers consist of installations conforming to the requirements of 32.3.3.7 and 33.3.3.7 (NFPA *101*), as appropriate. The full value for the presence of smoke barriers is awarded where an existing separation is by smoke partitions complying with Section 8.4 (NFPA *101*) on stories used for sleeping by not more than 30 residents.

7.4.4.11.3 Mechanically Assisted Systems — by Floor. Mechanically assisted smoke control on a corridor basis is a tested and accepted smoke control system initiated by a method of smoke detection that ensures operation of the smoke control system before significant smoke has entered into the corridor involved. One method of judging the acceptability of smoke control systems is contained in NFPA 92, *Standard for Smoke Control Systems*.

7.4.4.11.3.1 The mechanism must be capable of pressurizing the corridor sufficiently to prevent smoke from the room/suite or space of origin from entering the corridor during the entire course of the fire. Such a system must be able to hold back the smoke through the expected maximum severity of the fire. It also must be capable of exhausting smoke from the corridor based on the assumption that the emergency evacuation procedures and other activities involving the opening and closing of doors will cause occasional brief periods during which the smoke control system is overpowered.

7.4.4.11.3.2 This results in the movement of the smoke from the fire area into the corridor. (The exhausting of the smoke normally would be accomplished by having an exhaust fan of lower capacity than the fan supplying air for pressurization exhaust from the corridor. The net pressurization force would occur from the effect of the pressurizing fan minus the effect of the removal or purging fan.)

7.4.4.11.3.3 The corridor's pressurizing system could involve early warning smoke detection, automatic closing of all room/suite doors, sprinkler protection, or all three. Where these additional protection devices are provided to effect such a smoke control system, the individual credits for each of the involved protection devices are in addition to the credits for the smoke control system.

7.4.4.11.4 Mechanically Assisted Systems — by Zone. Mechanically assisted smoke control on a zone basis shall include a smoke barrier (or a horizontal exit) supported by a tested and accepted smoke control system to provide a pressure differential that assists in confining smoke to the compartment of origin. One method of judging the acceptability of smoke control systems is contained in NFPA 92, *Standard for Smoke Control Systems*. Special smoke control fans shall be permitted to be used, or special adjustments of the normal building air movement fans shall be permitted to be made.

7.4.4.11.5 Mechanically Assisted Systems — by Room/Suite. Mechanically assisted smoke control on a room/suite basis is a tested and accepted smoke control system so designed as to provide a mechanism of automatically controlled fans, smoke vent shafts, or a combination thereof to ensure a positive pressure differential that prevents intrusion of smoke into any room or suite not involved in fire. One method of judging the acceptability of smoke control systems is contained in NFPA 92, *Standard for Smoke Control Systems*. In this method, the rooms have a pressure differential higher than that of the corridor and of any room where fire has been detected. Such systems shall be so arranged that there is detection in each room or suite that prevents a room involved in fire from becoming positively pressurized.

▲ **7.5 Worksheets for Evaluating Fire Safety in a Large Facility.** A large facility normally is one that has a capacity for more than 16 residents. For each such facility to be evaluated, the seven-step process in Figure 7.5 should be followed when evaluating fire safety.

▲ **7.5.1 Step 1 — Complete Cover Sheet Using Worksheet 7.5.1.** See Figure 7.5.

▲ **7.5.2 Step 2 — Determine Safety Parameter Values, Using Worksheet 7.5.2.** Select and circle the safety value for each safety parameter that best describes the conditions in the facility. Choose only one value for each of the 11 parameters. If two or more values appear to apply, choose the one with the lowest point value.

▲ **7.5.3 Step 3 — Complete Individual Safety Evaluations Using Worksheet 7.5.3.** The following steps should be taken:

(1) Transfer each of the 11 circled safety parameter values from Worksheet 7.5.2 to every available block in the line with the corresponding safety parameter in Worksheet 7.5.3. Where the block is marked "÷ 2 =," enter one-half the value from Worksheet 7.5.2.
(2) Add each of the four columns, keeping in mind that any negative numbers need to be deducted.
(3) Transfer the resulting values for S_1, S_2, S_3, and S_4 to the corresponding blocks in Worksheet 7.5.5.

▲ **7.5.4 Step 4 — Determine Mandatory Requirements Using Worksheet 7.5.4A, 7.5.4B, or 7.5.4C.** The following steps should be taken:

(1) Select the level of requirements from Worksheet 7.5.4A, 7.5.4B, or 7.5.4(C). Circle the appropriate values.
(2) Transfer the circled values from Worksheet 7.5.4A, 7.5.4B, or 7.5.4C to the corresponding blocks for S_a, S_b, S_c, and S_d in Worksheet 7.5.5.

▲ **7.5.5 Step 5 — Evaluate Equivalency.** The following steps should be taken:

(1) Perform the subtractions indicated in Worksheet 7.5.5. Enter the differences in the appropriate answer blocks.
(2) For each row, check "yes" if the value in the answer block is zero (0) or greater. Check "no" if the value in the answer block is a negative number.

▲ **7.5.6 Step 6 — Evaluate Other Considerations Not Previously Addressed, Using Worksheet 7.5.6.** The equivalency covered by Worksheets 7.5.2 through 7.5.5 includes the majority of the considerations covered by the *Life Safety Code*. Some considerations are not evaluated by this method and must be considered separately. These additional considerations are covered in Worksheet 7.5.6, Facility Fire Safety Requirements Worksheet. Complete one copy of this separate worksheet for each facility.

▲ **7.5.7 Step 7 — Determine Equivalency Conclusion.** Conclude whether the level of life safety is at least equivalent to that prescribed by the *Life Safety Code*, using Worksheet 7.5.7, Conclusions. Worksheet 7.5.7 combines the zone fire safety equivalency evaluation of Worksheet 7.5.5 and the additional considerations of Worksheet 7.5.6.

▲ **7.6 Glossary for Fire Safety Evaluation Worksheet for an Apartment Building with Board and Care Occupancies.**

7.6.1 Introduction. This glossary is provided to assist in completing Figure 7.7, Worksheets for Evaluating Fire Safety in an Apartment Building with Board and Care Occupancies, to determine the suitability of an apartment building to house a board and care occupancy. This is a two-step procedure. The first step is to evaluate the portion of the building used as a board and care home; the second step evaluates the remainder of the building. The instructions for completing Figure 7.7 are included in Section 7.7. They are not repeated in this glossary. This glossary provides expanded discussion and definitions for the various items in the worksheets to assist the user where questions of definition or interpretation arise. To the maximum extent possible, the glossary does not repeat the definitions already existing in NFPA *101*, *Life Safety Code*, but rather references the appropriate paragraphs in NFPA *101*.

7.6.2 Areas of Application.

7.6.2.1 The entire apartment building is evaluated on a form to the degree indicated by each item on the worksheet. See Worksheet 7.7.1. However, spaces that are not used for living units, are not in direct utility or maintenance support of the living units, are not provided for tenant use, or are not in any way involved in resident emergency egress shall be permitted to be omitted from the calculation where such space is separated from all of the tenant and tenant-support spaces by 2-hour fire resistance–rated construction (including any members that bear the load of tenant-use space and with 1½-hour fire doors in any communicating opening). In such cases, however, any appropriate charges under 7.6.4.2 in Safety Parameter 2, "Hazardous Areas," in Worksheet 7.7.2 shall be charged.

7.6.2.2 The suitability of the apartment unit actually used as the board and care home is evaluated separately and shall be permitted to be evaluated before or after evaluating the suitability of the apartment building.

7.6.2.3 Where evaluating an apartment unit, consider the common corridor as equivalent to the outside where evaluating egress routes. Also, where evaluating egress routes, credit a window only if it can be used in an emergency evacuation.

WORKSHEET 7.5.1 COVER SHEET

Fire Safety Evaluation Worksheet for a Large Board and Care Facility

Facility Identification _____ Zone(s) Evaluated _____

Evaluator _____ Date _____

▲ WORKSHEET 7.5.2 SAFETY PARAMETER VALUES — LARGE FACILITY

Safety Parameters	Parameter Values							
1. Construction	Combustible					Noncombustible		
Stories in Height	Type V(000)	Type V(111)	Type III(200)	Type III(211)	Type IV (2HH)	Type II(000)	Type II(111)	Type II(222) & Type I
1 Story	−2( )[a]	0	−2( )[a]	0	0	0	2	2
2 Stories	−6( )[a]	0	−6( )[a]	0	0	−5( )[a](0)[s]	2	2
3–4 Stories	−8( )[a]	−2(0)[q]	−8( )[a]	0	−2(0)[q]	−6( )[a]	2	2
5–6 Stories	−8	−2(0)[q]	−8( )[a]	0	−2(0)[q]	−6( )[a]	2	2
Over 6 Stories	−10	−4	−10	−2(0)[q]	−4(0)[q]	−8	0	2

2. Hazardous Areas	Within Bdrms./Suite or on Exit Routes		Elsewhere in Building		None, or No Deficiency
	Double Deficiency	Single Deficiency	Double Deficiency	Single Deficiency	
	NP	−4	−4(−7)[b]	0(−4)[b]	0(−1)[t]

3. Manual Fire Alarm	None or Incomplete	Manual Alarm	
		W/O F.D. Notification	W/ F.D. Notification
	0(2)[f]	2	3

4. Smoke Detection and Alarm	None or Incomplete	Single Station Units in Each Bedroom	Interconnected System[i]			Total Building
			W/O Bdrm./ Suite Detectors	Single Station Bdrm./Suite Detectors	Interconnected Bdrm./Suite Detectors	
	−10(0)[j]	0(2)[j]	2(0)[e]	3(0)[e](6)[p]	5(6)[p]	6

5. Automatic Sprinklers	None or Incomplete	Bdrms./Suites Only	Corrs., Common Spaces	Bdrms./Suites, Corrs., Common Spaces	Total Building	
					AS	QRS
	0	2(0)[c]	4(0)[c]	6	8	10

6. Separation of Sleeping Rooms From Exit Access	None or Incomplete	Fire Resistance/Walls and Doors—Expectation of Door Closing				
		Expectation—Not High		Expectation—High		
		Smoke Resisting[g]	½-hr Walls 20-min Doors[g,r]	Smoke Resisting[g]	½-hr Walls 20-min Doors[g,r]	1-hr Walls 20-min Doors[g]
	−6	−1(0)[k]	0(1)[k]	1	2(3)[l]	3(4)[l]

7. Exit System	Single or Exposed Route	Multiple Routes			Direct Exit
		Deficient	W/O Horiz. Exit	W/ Horiz. Exit	Smokeproof Enclosure	
	−6(0)[m]	−2(0)[m]	0	2	2	4

8. Exit Access (from living unit)	Max. Dead End		No Dead End >30 ft and Travel Is:			
	>100 ft	>30 ft to ≤100 ft	>250 ft	>125 ft to ≤250 ft	>50 ft to ≤125 ft	≤50 ft
	−6(0)[d]	−4(0)[d]	−2	−1	0	2

9. Interior Finish	Flame-Spread Ratings					
Exit Routes	>75 to ≤200		>25 to ≤75		≤25	
Rooms/Suites	>75 to <200	≤75	>75 to ≤200	≤75	>25 to ≤200	≤25
	−3	−1	0	1	1	2

10. Vertical Openings	Open (or Incomplete Enclosure)			Enclosed[h]		
	Involving 5 or More Floors	3–4 Floors	2 Floors	<30 min	≥30 min <1 hr	≥1 hr
	−10	−7	−2	−1	0	1(0)[b]

(Worksheet 7.5.2 continues)

FIGURE 7.5 Worksheets for Evaluating Fire Safety in a Large Facility.

Worksheet 7.5.2 ***Continued***

11. Smoke Control			Mechanically Assisted Systems			
			By Floor			
	None	Smoke Barriers	W/O Part.	W/ Part.	By Zone	By Rm./Suite
	0(2)[n]	2(2)[u]	2	3	3	4

[a] In existing facilities and for conversions, use (–1 × stories in height) if building is fully sheathed with plaster, gypsum board, or similar materials, but not < –2 if Parameter 5 is ≥8.
[b] Use ( ) if Parameter 1 is based on Type V(000), Type III(200), or Type II(000), if Note A does not apply, and if Parameter 5 is ≤4.
[c] Use ( ) if Parameter 1 is based on Type V(000), Type III(200), or Type II(000).
[d] Use ( ) if Parameter 7 is –6.
[e] Use ( ) if Parameter 6 is based on "none or incomplete," or "walls or doors" are ½-hour walls/20-minute doors and Parameter 5 is ≤4.
[f] Use ( ) for existing levels "prompt" and "slow" if Parameter 7 is 4 and building height is ≤3 stories.
[g] Rate separation as:
- In existing facilities, ½ hour (or actual rating, if greater) if Parameter 5 is ≥6.
- Smoke resisting if Parameter 1 is based on Type V(000), Type III(200), or Type II(000), if building is not fully sheathed per Note A, and if Parameter 5 is ≥4.

[h] Use 0 in 1-story building.
[i] Interconnected system covers corridors and common spaces plus indicated bedroom or suite detectors.
[j] Use ( ) if Parameter 5 is ≥6.
[k] Use ( ) in facilities where each bedroom/suite has occupant controlled personal security access locks.
[l] Use ( ) if separations between bedrooms/suites also meet criteria.
[m] Use ( ) if requirements for 33.3.3.6.1.2 (NFPA *101*) are met.
[n] Use ( ) if floor travel does not exceed 200 ft.
[p] Use (6) if facility protected throughout by quick-response automatic sprinklers, corridor and common space detectors, and bedroom/suite smoke alarms.
[q] Use (0) if Parameter 5 is ≥8.
[r] In new facilities, rate separation as ½-hour walls/20-minute doors, where doors are smoke resisting and walls are ½-hour fire resistance–rated if Parameter 5 is 10.
[s] Use (0) if Parameter 5 is 10.
[t] Use (–1) if evacuation capability is impractical and fire-rated hazardous area separation barriers are not also smoke partitions.
[u] Use (2) if an existing separation is by smoke partition on stories used for sleeping by not more than 30 residents.

For SI units, 1 ft = 0.3048 m; 1 ft² = 0.092 m².

NP: Not permitted—system not usable while this condition exists.

WORKSHEET 7.5.3 INDIVIDUAL SAFETY EVALUATIONS — LARGE FACILITY

Safety Parameters	Fire Control (S_1)	Egress Provided (S_2)	Refuge Provided (S_3)	General Fire Safety Provided (S_4)
1. Construction		X		
2. Hazardous Areas		÷ 2 =		
3. Manual Fire Alarm	÷ 2 =		X	
4. Smoke Detection and Alarm	÷ 2 =		÷ 2 =	
5. Automatic Sprinklers		÷ 2 =	÷ 2 = *(See note.)*	
6. Separation of Sleeping Rooms from Exit Access		÷ 2 =		
7. Exit System	X		÷ 2 =	
8. Exit Access (from living unit)	X		X	
9. Interior Finish	÷ 2 =		X	
10. Vertical Openings	÷ 2 =			
11. Smoke Control	X			
Total	S_1 =	S_2 =	S_3 =	S_4 =

NOTE: Use full value if Safety Parameter 1 is based on Type V(000), Type III(200), or Type II(000) construction. Divide by 2 (÷2) in all other cases.

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Large) (p. 2 of 4)

FIGURE 7.5 ***Continued***

WORKSHEET 7.5.4A MANDATORY SAFETY REQUIREMENTS — NEW LARGE FACILITY

Stories in Height	Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
1 Story	15	17	15	21
2 Stories	17	17	17	23
≥3 Stories	19.5	18	15	26

WORKSHEET 7.5.4B MANDATORY SAFETY REQUIREMENTS — EXISTING LARGE FACILITY WITH PROMPT OR SLOW EVACUATION CAPABILITY

Evacuation Capability and Stories in Height	Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
Prompt ≤30 residents and 1 Story	1.5	7.5	2	6
Prompt or slow				
1 Story	3.5	8	4	8
2 Stories	2.5	8	3	7
3–6 Stories	4.5	8	5	9
>6 Stories	6.5	8	7	11

WORKSHEET 7.5.4C MANDATORY SAFETY REQUIREMENTS — EXISTING, SPRINKLER PROTECTED, LARGE FACILITY WITH PROMPT OR SLOW EVACUATION CAPABILITY

Evacuation Capability and Stories in Height	Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
Prompt ≤30 residents 1 Story	5.5	3.5	6	5
Prompt or slow				
1 Story	5.5	3.5	6	5
2 Stories	1.5	3.5	2	1
3–6 Stories	5.5	3.5	6	5
>6 Stories	7.5	3.5	4	7

WORKSHEET 7.5.4D MANDATORY SAFETY REQUIREMENTS — EXISTING LARGE FACILITY WITH IMPRACTICAL EVACUATION CAPABILITY

Stories in Height	Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
1 Story	6	6.5	8.5	8
2 Stories	2	6.5	4.5	4
3–6 Stories	6	6.5	8.5	8
>6 Stories	8	6.5	6.5	10

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Large) (p. 3 of 4)

FIGURE 7.5 ***Continued***

WORKSHEET 7.5.5 EQUIVALENCY EVALUATION

						Yes	No
Control Provided (S_1)	minus	Required Control (S_a)	≥	0	S_1 ☐ – S_a ☐ = ☐		
Egress Provided (S_2)	minus	Required Egress (S_b)	≥	0	S_2 ☐ – S_b ☐ = ☐		
Refuge Provided (S_3)	minus	Required Refuge (S_c)	≥	0	S_3 ☐ – S_c ☐ = ☐		
General Fire Safety (S_4)	minus	Required Gen. Fire Safety (S_d)	≥	0	S_4 ☐ – S_d ☐ = ☐		

WORKSHEET 7.5.6 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

	Considerations	Met	Not Met	Not Applic.
A.	Utilities comply with the provisions of 32.3.6.1 and 33.3.6.1.			☒
B.	Heating, ventilating, and air conditioning equipment comply with the provisions of 32.3.6.2 and 33.3.6.2, except for enclosure of vertical openings, which have been considered in Safety Parameter 10 of Worksheet 7.5.3.			☒
C.	Elevators, dumbwaiters, and vertical conveyors comply with the provisions of 32.3.6.3 and 33.3.6.3.			
D.	Rubbish chutes, incinerators, and laundry chutes comply with the provisions of 32.3.6.4 and 33.3.6.4.			☒
E.	Complies with the applicable requirements of Sections 32.7 and 33.7.			

All references are to NFPA *101*, *Life Safety Code.*

WORKSHEET 7.5.7 CONCLUSIONS

1. ☐ All of the checks in Worksheet 7.5.5 are in the "Yes" column and all applicable considerations in Worksheet 7.5.6 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for large residential board and care occupancies.

2. ☐ All of the checks in Worksheet 7.5.5 are in the "Yes" column and all considerations identified in Worksheet 7.5.6 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for large residential board and care occupancies.

3. ☐ One or more of the checks in Worksheet 7.5.5 are in the "No" column or any consideration identified in Worksheet 7.5.6 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for large residential board and care occupancies.

Notes:

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Large) (p. 4 of 4)

FIGURE 7.5 ***Continued***

7.6.3 Maintenance. All protection systems, requirements, arrangements, and procedures shall be maintained in a dependable operating condition and a sufficient state of readiness and shall be used in such a manner that the intended safety function or hazard constraint is not impaired. Otherwise, they shall receive no credit in the evaluation.

7.6.4 Safety Parameters (Worksheet 7.7.2). The safety parameters are a measure of those building factors that bear on or contribute to the safety of those persons who might be in the building at the time of a fire. Each of the safety parameters is to be analyzed, and the safety value for each parameter that best describes the condition in the building is to be identified. Only one value for each of the parameters is to be chosen. If two or more values appear to apply, the one with the lowest point value shall be used.

7.6.4.1 Construction. The construction parameter values are applied to the entire building as defined in 7.6.4.1.1 through 7.6.4.1.3.

7.6.4.1.1 In evaluating the construction values, the height of the building is the story height of the board and care dwelling unit relative to the level of exit discharge, regardless of the total height of the building, which is defined as *stories in height* in 3.3.267 (NFPA *101*) and 4.6.3 (NFPA *101*).

7.6.4.1.2 Where the facility includes additions or connected structures of different construction, the rating and classification of the structure shall be based on the following:

(1) Separate buildings where a 2-hour or greater fire resistance–rated separation exists between the portions of the building
(2) The lower safety parameter point score involved where such a separation does not exist

7.6.4.1.3 The safety parameter values for Type V(000), Type III(200), and Type II(000) receive a higher parameter credit if the building is fully sheathed. This credit is to be given if all portions of the bearing walls, bearing partitions, floor construction, roofs [or a floor/loft system if the space above the highest ceiling is inaccessible and either is provided with draft stops or other barriers on 30 ft (9.1 m) spacing or is provided with heat- or smoke-actuated fire detectors that sound the building fire alarm], and all columns, beams, girders, trusses, or similar bearing members either have an inherent fire resistance or are sheathed, encased, or otherwise treated to provide approximately a ½-hour or greater fire resistance rating. Buildings fully sheathed with sound lath and plaster, gypsum board, or equivalent sheathing are considered to meet this criterion.

7.6.4.2 Hazardous Areas. The hazardous area parameter applies to the entire building except the apartment(s) actually used for the residential board and care facility. The assignment of charges for hazardous areas is a four-step process.

7.6.4.2.1 Step 1 — Identify Hazardous Areas. Hazardous areas are those having a degree of hazard greater than that normal to the general occupancy of the building, such as areas for storage of combustibles or flammables, for heat-producing appliances, or for maintenance purposes.

7.6.4.2.2 Step 2 — Determine the Level of Hazard. There are two levels of hazard: structurally endangering and not structurally endangering.

7.6.4.2.2.1 Structurally Endangering. A hazardous occupancy with sufficient fire or explosion potential to defeat the basic integrity of the building framing as defined in 7.6.4.1.

7.6.4.2.2.2 Not Structurally Endangering. A hazardous occupancy with sufficient fire potential to build to full involvement and present a danger of propagating through openings or wall partitions but not possessing sufficient total potential to endanger the structural framing or floor decking as defined in 7.6.4.1.

7.6.4.2.3 Step 3 — Determine the Fire Protection Provided. The parameter value for hazardous areas is based on the presence or absence of the fire protection necessary to control or find the hazard. Two different types of fire protection are considered. The first consists of automatic sprinklers or other appropriate extinguishing systems covering the entire hazard. The second is a complete fire resistance–rated enclosure, including the separation of the hazardous area from any bearing members, partitions separating the hazardous area from all other spaces, and doors to the space sufficient to exceed the potential of the fire load involved. Any hazardous space that has either of these protection systems is classed as having single protection. Any hazardous space that is both fully enclosed — as described above — and sprinklered is classed as having double-level protection. On this basis, any hazardous area with a fuel load that has the potential of overwhelming the available structural capability could as a minimum have a single deficiency as determined in 7.6.4.2.4. Note that, where the hazardous area abuts an egress route (exit or exit access) addressed in 7.6.4.7 and 7.6.4.8, the credit for sprinklers shall not be permitted unless the hazardous area is separated from the rest of the living unit or the egress route by reasonably smoke-resisting barriers and doors.

7.6.4.2.4 Step 4 — Determine Degree of Deficiency and Assign Parameter Values. The parameter value ultimately is determined by the degree of the deficiency of the hazardous area based on the level of protection needed. Table 7.6.4.2.4 provides a matrix for determining the degree of deficiency to

Table 7.6.4.2.4 Hazardous Areas — Degree of Deficiency

	No protection	Sprinkler protection	Fire resistance–rated enclosure	Sprinklered and fire resistance–rated enclosure
Not structurally endangering	Single deficiency	No deficiency		
Structurally endangering	Double deficiency	Single deficiency	No deficiency* Double deficiency†	No deficiency* Single deficiency†

*If fire resistance and structural strength exceed maximum potential of hazard.
†If fire resistance and structural strength are not sufficient to withstand potential of hazard.

be assessed. In some situations, more than one hazardous area with the same or differing levels of deficiency exists. The overall charge is based on the single most serious deficiency for the hazardous area.

7.6.4.3 Manual Fire Alarm. Manual fire alarms are defined in 7.6.4.3.1 through 7.6.4.3.3.

7.6.4.3.1 None or Incomplete. There is no manual fire alarm system, or the system is incomplete and does not meet the requirements for a higher-scored category.

7.6.4.3.2 Without Fire Department Notification (W/O F.D. Notification). There is a manual fire alarm system, regardless of the number of stories or units, meeting the appropriate requirements of 30.3.4.1 through 30.3.4.3 (NFPA *101*) and those requirements applicable to existing Option 1 apartment buildings in 31.3.4.1 through 31.3.4.3 (NFPA *101*).

7.6.4.3.3 With Fire Department Notification (W/ F.D. Notification). There is a manual fire alarm system that complies with the requirements of 7.6.4.3.2 and, in addition, automatically transmits a signal to the fire department in accordance with 9.6.4 (NFPA *101*).

7.6.4.4 Smoke Detection and Alarm. These parameter values apply only to apartments other than the group residence and to the areas used for apartment corridors and other common spaces. A detection system as used herein is one based on the use of smoke detectors. No credit is given for thermal detectors.

7.6.4.4.1 None or Incomplete. There are no detectors, or, if any are present, they do not meet the requirements for a higher-scored category.

7.6.4.4.2 Interconnected Systems. Interconnected systems are those systems where the operation of any detector sounds alarm devices on other detectors, or other separate alarm systems, that are spread out sufficiently to alert all of the building occupants. Where the systems are of the total building variety, the credit shall be permitted to be given only if the building has a manual fire alarm system and the operation of the detection system sounds the manual fire alarm as though a fire alarm box on that floor had been operated. Interconnected systems must provide sounding devices that are sufficient in location and loudness to ensure the awakening of persons who sleep normally.

7.6.4.4.2.1 Corridors and Common Spaces. This parameter applies to those situations where there is at least one detector spaced every 30 ft (9.1 m) in corridors and an additional detector in all common use spaces for each 900 ft^2 (83.6 m^2) or less of floor space. Detectors shall be permitted to be omitted from common use spaces that comply with one of the following:

(1) They are both sprinklered and protected from any egress routes or area of refuge or staging that serves the board and care home by the use of automatic-closing doors operated by smoke detection or activation of the sprinkler system.
(2) They are separated from the egress route or area of refuge or staging in 7.6.4.4.2.1(1) by fire resistance–rated construction and by automatic-closing doors of sufficient fire resistance rating to withstand the maximum fire potential in the common space.

7.6.4.4.2.2 Corridors and Common Spaces plus Each Level of Living Units. To be credited in this category, detectors must be provided in both of the following locations:

(1) Each living unit such that there is one detector or more in each single-level living unit or one detector or more on each level of any multilevel living unit
(2) Corridors and common spaces in accordance with the requirements of 7.6.4.4.2.1

7.6.4.4.3 Total Building System. A dwelling has a total building system if it meets the requirements of 31.3.4.4 for Option 2 (NFPA *101*).

7.6.4.5 Automatic Sprinklers. The parameter values for automatic sprinklers are based on the protection of spaces outside the apartment used for group residences.

7.6.4.5.1 None or Incomplete. No credit is given if there are no sprinklers or if sprinklers, though present, are not sufficient to qualify for one of the other categories specified herein. Note that any space that is credited as being protected by automatic sprinklers and abuts a hazardous area judged deficient in accordance with 7.6.4.2 shall not be permitted to be considered as sprinkler protected unless that hazardous area also is sprinkler protected.

7.6.4.5.2 Corridors, Public Spaces. Sprinkler protection covers all of the corridors and public spaces that separate, directly expose, or are in the egress path from the living units (except fire resistance–rated, enclosed, noncombustible stairwells). Sprinklers shall be installed along the corridor ceiling, and, in addition, one sprinkler shall be installed opposite the center of and inside of any living unit door opening onto the corridor.

7.6.4.5.3 Living Units Only. All living units have sprinkler protection complying with the requirements for light hazard protection in NFPA 13, *Standard for the Installation of Sprinkler Systems*; NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*; or NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies*, as appropriate.

7.6.4.5.4 Corridor and Habitable Space. Such space meets the combined requirements for 7.6.4.5.2 and 7.6.4.5.3.

7.6.4.5.5 Total Building. The building is totally sprinkler protected in accordance with Section 9.7 (NFPA *101*) and is equipped with an automatic alarm initiating device that activates the building manual fire alarm system. Credit for total sprinkler protection shall not be given unless the living unit used for board and care purposes also is provided with total sprinkler protection.

7.6.4.6 Separation of Board and Care Home Unit and Its Exit Route from Other Spaces.

7.6.4.6.1 This parameter applies to all living units abutting corridors that might be used or involved in the exit system or to any areas of refuge or staging servicing the board and care unit. The separation requirements also apply to any common wall partitions between the board and care unit and any other living unit in the building.

7.6.4.6.2 Separation of living units from each other and from common spaces shall be based on the wall partition that makes up the separation and the protection of the openings in those partitions.

7.6.4.6.3 Duct penetrations where the duct is open on only one side of the partition and is of sheet steel construction shall be considered as equivalent to doors having a fire protection rating of at least 20 minutes. Where there are duct openings on both sides of the partition, the opening shall be considered unprotected unless there is a fire damper in the duct opening or the duct otherwise meets the requirements for omission of fire dampers as specified in NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

7.6.4.6.4 The partition shall be considered as "none or incomplete" if it has unprotected openings (louvers, gaps, transfer grilles, plain glass windows, or plain glass transoms) between the floor and the ceiling. If openings exist above the ceiling level (or even if the partition stops at the ceiling level), the walls shall be considered as complete if the ceiling itself is a complete membrane (such as plasterboard or lath and plaster). In this case, the fire resistance rating shall be based on that of the wall or ceiling system, whichever is less.

7.6.4.6.5 Walls shall be considered to have less than a ½-hour fire resistance rating if they are not equivalent to ½ in. (13 mm) gypsum wallboard, on both sides of studs, that is well nailed or fastened to the studs with appropriate taping and finishing of joints and fasteners. Walls shall be considered to be equivalent to or greater than a 1-hour fire resistance rating if they are part of any of the established systems recognized as having 1-hour or more fire resistance in accordance with recognized tests or approved listings.

7.6.4.6.6 Doors shall be considered as "none or incomplete" if any living unit does not have a door, or if the living unit has a door but there is some mechanism or obstruction that prevents closing of the door or otherwise leaves a significant opening between the door and the corridor, or the door has open louvers, or the door has ordinary glass lights or transoms. Doors that have been blocked open by doorstops, chocks, tiebacks, or other devices that need manual unlatching or releasing action to close the door shall be classified as "none or incomplete." Doors that are not provided with a latch or other device suitable for keeping the door tightly closed also shall be classified as "none or incomplete." Note that ordinary glass lights shall not be considered as requiring the "none or incomplete" classification in locations where both sides of the glass light are protected by automatic sprinklers.

7.6.4.6.7 Doors shall be considered as having 20-minute or greater fire protection rating if they are of 1¾ in. (44 mm) thick solid bonded wood core construction or an arrangement of equivalent or greater stability in fire integrity. The thermal insulation capability of the door is not considered. Hollow steel or sheet steel doors, therefore, meet the 20-minute requirement.

7.6.4.6.8 Doors shall be considered automatic-closing if they are provided with either traditional self-closing mechanisms or release mechanisms actuated by smoke detectors. In the case of doors separating living units from each other or from common spaces, self-closing doors shall be permitted whether or not they are equipped with devices that can be used to hold them in the open position, provided the normal routine of the living unit is to keep the door closed, particularly after the occupants have retired for the night. Note that this parameter category does not cover the charges for dead-end conditions, travel distance, interior finish in the egress routes (exit or exit access), or enclosure of stairways or other egress routes that pass from floor to floor. These elements are covered separately in 7.6.4.8, 7.6.4.9, and 7.6.4.10.

7.6.4.6.9 A separation is considered standard (i.e., rated as equivalent to walls greater than 1 hour, doors greater than 20 minutes) if the fire resistance of the doors and walls is equivalent to that specified by Chapters 30 and 31 (NFPA *101*) for the protection level involved.

7.6.4.7 Exit System. This parameter applies to the entirety of the exit routes serving the group residence. Exit routes are the paths of travel from the living unit to the outside, using any of the types and arrangements described in Chapter 7 (NFPA *101*).

7.6.4.7.1 Multiple Routes. Multiple routes exist where the occupants of any living unit have a choice of two separate exit routes to the outside, using those types permitted by Section 30.2 or 31.2, as appropriate (NFPA *101*). Occupants have a choice of routes either from the living unit or through access in a corridor adjacent to the living unit. Single exit routes complying with 30.2.4.6, 31.2.4.5, or 31.2.4.6 (NFPA *101*) qualify as multiple routes. *[See 7.6.4.7.6 for facilities complying with the single exit route provisions of 30.2.4.4 or 31.2.4.4 (NFPA 101).]*

7.6.4.7.2 Deficient. An exit route is deficient if it fails to meet any of the applicable criteria covered by Chapter 7 (NFPA *101*). The exit system also is classed as deficient if a smoke barrier, as required by 30.3.7 or 31.3.7 (NFPA *101*), is not provided.

7.6.4.7.3 Without Horizontal Exit (W/O Horiz. Exit). An egress system is based on this charge if there are multiple routes that are not deficient but the arrangement does not include a horizontal exit as defined in 7.6.4.7.4 or have an acceptable direct exit from each living unit as defined in 7.6.4.7.6.

7.6.4.7.4 With Horizontal Exit (W/ Horiz. Exit). A single horizontal exit on each floor containing living units shall be considered a horizontal exit if the space created is of sufficient size to provide at least 3 ft^2 (0.28 m^2) of accessible space for all of the potential occupants, including those already present in and those evacuating to such space. The details of horizontal exits also shall meet the requirements of 7.2.4 (NFPA *101*). A horizontal exit acts as a smoke barrier, and, where provided, is credited as both a smoke barrier in 7.6.4.11 and a horizontal exit in 7.6.4.7.

7.6.4.7.5 Smokeproof Enclosure. Credit for a smokeproof enclosure shall be permitted to be given if either the stairway so designated meets the requirements for a smokeproof enclosure specified in 7.2.3 (NFPA *101*) or the stairway has an acceptably designed smoke pressurization system maintaining a positive pressure in the stairwell sufficient to prevent intolerable contamination of the stairwell by smoke or other fire effects. To receive the credit for smokeproof enclosures, all exit stairs credited in 7.6.4.7 and 7.6.4.8 must meet the smokeproof enclosure requirement.

7.6.4.7.6 Direct Exit.

7.6.4.7.6.1 To be credited for direct exits, each living unit shall have within that unit a door that opens to the exterior at grade or onto an unenclosed exterior balcony with direct access to an unenclosed exterior exit or smokeproof enclosure. The credit for direct exit is applicable even if there are no other exit routes from the involved living unit and if the following apply:

(1) The opening is directly onto a grade.
(2) The exit is located so that any person egressing can move directly away from the building without further exposure.

7.6.4.7.6.2 Single exit routes complying with 30.2.4.4 or 31.2.4.4 (NFPA *101*) qualify as direct exits. *[See 7.6.4.7.1 for facilities complying with the single exit route provisions of 30.2.4.6, 31.2.4.5, or 31.2.4.6 (*NFPA *101).]* Existing buildings more than six stories in height with exterior exit access in accordance with 31.3.5.11.2 (NFPA *101*) qualify as having a direct exit.

7.6.4.8 Exit Access. This parameter applies only to the exit access route from the board and care home.

7.6.4.8.1 Exit access is a measurement of travel distance from the living unit to the outside or to an enclosed interior stairway or other exit (e.g., horizontal exit) or to a smoke barrier meeting the requirements in 7.6.4.11, whichever is shorter.

7.6.4.8.2 The charge for dead ends shall be made where any corridor affords access in only one direction to a required exit from the corridor. The calculation of the distance to determine the level of charge is the measurement from the centerline of the doorway exiting the living unit to the nearest point where a person has a choice of two directions or routes of egress.

7.6.4.9 Interior Finish (Egress Routes).

7.6.4.9.1 The interior finish within the living units is evaluated separately from the interior finish in the corridor and egress routes and other public space. Classification of interior finish is based on the flame-spread rating of the interior finish in accordance with ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*. The requirements apply to wall and ceiling finish materials as described in Section 10.2 (NFPA *101*). Choose the safety parameter value in Worksheet 7.7.2 based on the interior finish material provided. For example, if the interior wall finish material has a flame-spread rating of between 25 and 75, do not take the parameter value associated with a flame-spread rating of less than 25 regardless of the presence of automatic sprinkler protection. The mandatory values have been calibrated to take into consideration any sprinkler protection provided. Exposed portions of structural members complying with the requirements of Type IV(2HH) construction shall be permitted.

7.6.4.9.2 Interior wall and ceiling finish materials tested in accordance with NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, or NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, as permitted by Section 10.2 (NFPA *101*), and meeting the criteria established in Section 10.2 (NFPA *101*) for those test standards, shall be scored as Class A interior finish materials (flame spread ≤25).

7.6.4.9.3 Only floor coverings in the exit and exit access system are considered. For purposes of assigning the parameter values in Worksheet 7.7.2, such floor coverings are considered as having a flame spread ≤25 if they meet the requirements for Class I or II and as otherwise having a flame spread >75. Previously installed floor coverings shall be permitted, subject to the approval of the authority having jurisdiction.

7.6.4.9.4 No consideration is included in the safety parameter value for any finish with a flame-spread rating greater than 200 or for any material not rationally measured by ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*. Materials not rationally measured include foam plastics, asphalt-impregnated paper, or other materials capable of inducing extreme rates of fire growth and rapid flashover. In any case involving these materials, the resultant risk is considered beyond the capacity of this evaluation system and requires individual appraisal. Note that plywood of ¼ in. (6 mm) or greater thickness should be considered as having a flame-spread rating of ≤200.

7.6.4.10 Vertical Openings. This parameter applies to those portions of vertical openings exposing the floor containing the group residence or the exit routes from an apartment.

7.6.4.10.1 These values apply to vertical openings and penetrations including exit stairways, ramps, and any other vertical exits, pipe shafts, ventilation shafts, duct penetrations, and laundry and incinerator chutes. The charge for vertical openings shall be based on the presence or lack of enclosure and the fire resistance rating of the enclosure, if provided.

7.6.4.10.2 A vertical opening or penetration shall be classified as open or incomplete provided any of the following conditions apply:

(1) It is unenclosed.
(2) It is enclosed but does not have doors.
(3) It is enclosed but has openings other than doorways.
(4) It is enclosed with cloth, paper, or similar materials without any sustained firestopping capabilities.

7.6.4.10.3 If a shaft other than a credited exit route (i.e., credited as one of the multiple routes required in 7.6.4.7.1 or in determining travel distance in 7.6.4.8.1) is enclosed on all floors but one, and this results in an unprotected opening between that shaft and one, and only one, floor, the parameter value assigned to that shaft shall be 0. If a required egress route is contained in that shaft, the parameter value shall be (–2).

7.6.4.11 Smoke Control. This parameter applies to the floor containing the board and care home. Smoke control definitions are provided in 7.6.4.11.1 through 7.6.4.11.5.

7.6.4.11.1 None. There are no smoke barriers (or horizontal exits) on the floor, the floor is not served by a smokeproof enclosure, and there are no mechanically assisted smoke control systems serving the floor.

7.6.4.11.2 Smoke Barriers. Smoke barriers are partitions extending across the entire width of the building or so arranged

as to combine a partition in the corridor with existing building elements and subdividing partitions and walls to partition the building into two completely separate units. The smoke barrier must be equipped with doors in the corridor that are self-closing, closed upon detection by smoke detectors located at the door arches, or closed by smoke detector systems that have been credited with a six-point parameter value in 7.6.4.4. Smoke barriers also shall conform to the requirements of Section 8.5 (NFPA *101*). A horizontal exit acts as a smoke barrier and is credited as both a smoke barrier in 7.6.4.11 and a horizontal exit in 7.6.4.7.

7.6.4.11.3 Mechanically Assisted Automatic Systems — by Zone. Mechanically assisted smoke control systems protected on a zone basis shall include a smoke barrier (or a horizontal exit) supported by a mechanism of automatic control fans, smoke vent shafts, or a combination thereof to provide a pressure differential that assists in confining smoke to the compartment of origin. Fans shall be permitted to be special smoke control fans, or special adjustments of the normal building air movement fans shall be permitted to be made.

7.6.4.11.4 Mechanically Assisted Automatic Systems — by Unit. Mechanically assisted smoke control systems protected on a living unit basis are systems so designed as to provide a mechanism of automatically controlled fans, smoke vent shafts, or a combination thereof to ensure a positive pressure differential that prevents intrusion of smoke into any living unit not involved in fire. Therefore, the living unit has a pressure differential higher than that of the corridor and higher than that of any living unit where fire has been detected. Such systems shall be so arranged that the detection mechanism in each living unit prevents a fire-involved living unit from becoming positively pressurized.

7.6.4.11.5 Mechanically Assisted Automatic Systems — by Corridor. A mechanically assisted smoke control system protected on a corridor basis is a system initiated by a method of smoke detection that ensures operation of the smoke control system before significant smoke has entered into the corridor involved.

7.6.4.11.5.1 The mechanism must be capable of pressurizing the corridor sufficiently to prevent smoke from the living unit or space of origin from entering the corridor during the entire course of the fire. Such a system must be able to hold back the smoke through the expected maximum severity of the fire. It also must be capable of exhausting smoke from the corridor based on the assumption that the emergency evacuation procedures and other activities involving the opening and closing of doors will cause occasional brief periods during which the smoke control system is overpowered.

7.6.4.11.5.2 This results in the movement of the smoke from the fire area into the corridor. (The exhausting of the smoke normally would be accomplished by having an exhaust fan of lower capacity than that of the fan supplying air for pressurization exhaust from the corridor. The net pressurization force would occur from the effect of the pressurizing fan minus the effect of the removal or purging fan.)

7.6.4.11.5.3 The corridor's pressurizing system could involve early warning smoke detection, automatic closing of all living unit doors, sprinkler protection, or all three. Where these additional protection devices are provided to effect such a smoke control system, the individual credits for each of the involved protection devices are in addition to the credits for the smoke control system.

7.7 Worksheets for Evaluating Fire Safety in an Apartment Building with Board and Care Occupancies. For each apartment house containing one or more apartment units with a board and care occupancy, the seven-step process in Figure 7.7 should be followed when evaluating fire safety in an apartment building with board and care occupancies.

7.7.1 Step 1 — Complete Cover Sheet Using Worksheet 7.7.1. See Figure 7.7.

7.7.2 Step 2 — Determine Safety Parameter Values Using Worksheet 7.7.2. First, select and circle the safety value for each safety parameter in Worksheet 7.7.2 that best describes the conditions in the facility. Then, choose only one value for each of the parameters. If two or more values appear to apply, choose the one with the lowest point value.

7.7.3 Step 3 — Complete Individual Safety Evaluations Using Worksheet 7.7.3. The following steps should be taken:

(1) Transfer each of the 11 circled safety parameter values from Worksheet 7.7.2 to every available block in the line with the corresponding safety parameter in Worksheet 7.7.3. Where the block is marked "÷ 2 =," enter one-half the value shown in Worksheet 7.7.2.
(2) Add each of the four columns, keeping in mind that any negative numbers need to be deducted.
(3) Transfer the resulting values for S_1, S_2, S_3, and S_4 to the corresponding blocks in Worksheet 7.7.5.

7.7.4 Step 4 — Determine Mandatory Requirements Using Worksheets 7.7.4A through 7.7.4D. The following steps should be taken:

(1) Using the classifications of the building (i.e., "new" or "existing"), the building height, and the level of requirements established for small dwelling units, circle the appropriate value in each of the four columns in Worksheet 7.7.4A, 7.7.4B, 7.7.4C, or 7.7.4D as appropriate.
(2) Transfer the circled values from Worksheet 7.7.4A, 7.7.4B, 7.7.4C, or 7.7.4D to the corresponding blocks for S_a, S_b, S_c, and S_d in Worksheet 7.7.5.

7.7.5 Step 5 — Evaluate Fire Safety Equivalency. The following steps should be taken:

(1) Perform the subtractions indicated in Worksheet 7.7.5. Enter the differences in the appropriate answer blocks.
(2) For each row, check "yes" if the value in the answer block is zero (0) or greater. Check "no" if the value in the answer block is a negative number.

7.7.6 Step 6 — Evaluate Other Considerations Not Previously Addressed Using Worksheet 7.7.6. The equivalency covered by Worksheets 7.7.2 through 7.7.5 includes the majority of the considerations covered by the *Life Safety Code*. Some considerations are not evaluated by this method and must be considered separately. These additional considerations are covered in Worksheet 7.7.6, Facility Fire Safety Requirements Worksheet. Complete one copy of this separate worksheet for each facility.

7.7.7 Step 7 — Determine Equivalency Conclusion. Conclude whether the level of life safety is at least equivalent to that prescribed by the *Life Safety Code,* using Worksheet 7.7.7, Conclusions. Worksheet 7.7.7 combines the zone fire safety equivalency evaluation of Worksheet 7.7.5 and the additional considerations of Worksheet 7.7.6.

WORKSHEET 7.7.1 COVER SHEET

Fire Safety Evaluation Worksheet for an Apartment Building with Board and Care Occupancies

Building Identification _____

Evaluator _____ Date _____

WORKSHEET 7.7.2 SAFETY PARAMETER VALUES — APARTMENT BUILDING

Safety Parameters	Parameter Values							
1. Construction	Combustible					Noncombustible		
Stories in Height	Type V (000)	Type V (111)	Type III (200)	Type III (211)	Type IV (2HH)	Type II (000)	Type II (111)	Type II(222) & Type I
1 Story	−2( )[a]	0	−2( )[a]	0	0	0	2	2
2 Stories	−6( )[a]	0	−6( )[a]	0	0	−5( )[a]	2	2
3–4 Stories	−8( )[a]	−2(0)[k]	−8( )[a]	0	−2(0)[k]	−6( )[a]	2	2
5–6 Stories	−8	−2(0)[k]	−8( )[a]	0	−2(0)[k]	−6( )[a]	2	2
Over 6 Stories	−10	−4	−10	−2(0)[k]	−4(0)[k]	−8	0	2

2. Hazardous Areas (outside board & care home units)	Double Deficiency	Single Deficiency	None or No Deficiency
	−4(−7)[b,g]	0(−4)[g]	0

3. Manual Fire Alarm	None or Incomplete	Manual Alarm	
		W/O F.D. Notification	W/ F.D. Notification
	0(2)[i] (3)[m]	2	3

4. Smoke Detection and Alarm (outside board & care home units)	None or Incomplete	Interconnected System		Total Building
		Corrs. & Common Spaces	Corrs., Common Spaces, & Each Level of Living Units	
	0	3(0)[e] (3)[j]	4	6

5. Automatic Sprinklers (outside board & care home units)	None or Incomplete	Corrs., Public Spaces	Living Units Only	Corrs., Hab., & Public Spaces	Total Building
	0	2(0)[c]	4(0)[c]	6	8

6. Separation of Board & Care Home Unit and Its Exit Route from Other Spaces	None or Incomplete	Walls <30 min		Walls ≥30 min to <1 hr		Walls ≥1 hr	
		Doors <20 min W/O Closer	Doors ≥20 min W/O Closer	Doors <20 min W/Closer	Doors ≥20 min W/Closer	Doors <20 min W/Closer	Doors ≥20 min W/Closer
	−6	−2	0(−2)[b]	1(−2)[b]	2(−2)[b]	1(−2)[b]	4(−2)[b]

7. Exit System (serving board & care home units)	<2 Standard Routes	Multiple Routes				Direct Exit
		Deficient	W/O Horiz. Exit	W/ Horiz. Exit	Smokeproof Enclosure	
	−6	−2	0	2	2	4

8. Exit Access (serving board & care home units)	Max. Dead End Is		No Dead End > 50 ft and Travel Is				
	>100 ft	>50 ft or corridor common path >35 ft	>200 ft	>150 ft to ≤200 ft	>100 ft to ≤150 ft	>50 ft to ≤100 ft	≤50 ft
	−6(0)[d]	−4(0)[d]	−2	−1	0	1	2

9. Interior Finish (egress routes serving board & care home units)	Flame-Spread Ratings		
	>75 to ≤200	>25 to ≤75	≤25
	−3	−1	0

(Worksheet 7.7.2 continues)

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Apts.) (p. 1 of 4)

FIGURE 7.7 Worksheets for Evaluating Fire Safety in an Apartment Building with Board and Care Occupancies.

Worksheet 7.7.2 *Continued*

10. Vertical Openings	Open or Incomplete Enclosure			Enclosed [h]	
	Thru 5 or More Floors	3–4 Floors	2 Floors	<1 hour [f]	≥1 hour [f]
	−10	−7	−2	0	1(0)[b]

11. Smoke Control (serving floors having board & care home units)			Mechanically Assisted Systems		
	None	Smoke Barriers	By Zone	By Unit	By Corridor
	0(2)[l]	2	3	3	4

[a] Use (−1 × stories in height) if building is fully sheathed with plaster, gypsum board, or similar materials but not <−2 if Parameter 5 is 8.
[b] Use ( ) if Parameter 1 is based on Type V(000), Type III(200), or Type II(000), if Note [a] does not apply, and if Parameter 5 is ≤4.
[c] Use ( ) if Parameter 1 is based on Type V(000), Type III(200), or Type II(000).
[d] Use ( ) if Parameter 7 is −6.
[e] Use ( ) if Parameter 6 is based on "None or Incomplete," or "Walls or Doors" are ½-hr walls/20-min doors and Parameter 5 is ≤4.
[f] ≥30 min in existing building.
[g] Use ( ) if hazardous area is on exit route or in refuge area serving group home unit.
[h] Use 0 in 1-story building.
[i] Use (2) in 1–3 story buildings with <12 living units.
[j] Use (3) if corridors and common spaces are protected by quick response sprinklers.
[k] Use (0) if Parameter 5 is 8.
[l] Use ( ) where exemptions of 31.3.7.1 through 31.3.7.5 (NFPA *101*) apply.
[m] Use (3) if in compliance with 30.3.4.2.2 and 30.3.4.3.5 (NFPA *101*).

For SI units, 1 ft = 0.3048 m; 1 ft² = 0.092 m².

WORKSHEET 7.7.3 INDIVIDUAL SAFETY EVALUATIONS — APARTMENT BUILDINGS

Safety Parameters	Fire Control (S_1)	Egress Provided (S_2)	Refuge Provided (S_3)	General Fire Safety Provided (S_4)
1. Construction				
2. Hazardous Areas		÷ 2 =		
3. Manual Fire Alarm	÷ 2 =			
4. Smoke Detection and Alarm	÷ 2 =			
5. Automatic Sprinklers		÷ 2 =	÷ 2 = *(See note.)*	
6. Separation of Living Units		÷ 2 =		
7. Exit System			÷ 2 =	
8. Exit Access				
9. Interior Finish				
10. Vertical Openings	÷ 2 =			
11. Smoke Control				
Total	S_1 =	S_2 =	S_3 =	S_4 =

NOTE: Use full value if Safety Parameter 1 is based on Type V(000), Type III(200), or Type II(000) construction. Divide by 2 (÷2) in all other cases.

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Apts.) (p. 2 of 4)

FIGURE 7.7 *Continued*

WORKSHEET 7.7.4A MANDATORY SAFETY REQUIREMENTS — EXISTING APARTMENT BUILDINGS HOUSING EXISTING BOARD AND CARE FACILITIES

Stories in Height	Evacuation Capability	Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
1 Story	Prompt/Slow	2	5	3	5
	Impractical	5	5	6	8
2–6 Stories	Prompt/Slow	3	6	5	7
	Impractical	5	6	7	9
>6 Stories	Prompt/Slow	10.5	3.5	6	8
	Impractical	13.5	5.5	8	12

WORKSHEET 7.7.4B MANDATORY SAFETY REQUIREMENTS — NEW APARTMENT BUILDINGS

Stories in Height	Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
1 Story	9	3	4	6
2 Stories	11.5	4	7	9
≥3 Stories	13.5	4	9	11

WORKSHEET 7.7.4C MANDATORY SAFETY REQUIREMENTS — NONSPRINKLERED APARTMENT BUILDINGS MEETING 30.3.5.2 (NFPA *101*)

Stories in Height	Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
1 Story	3	10	4	10
2 Stories	5.5	11	7	13
≥3 Stories	7.5	11	9	15

WORKSHEET 7.7.4D MANDATORY SAFETY REQUIREMENTS — NEW BOARD AND CARE FACILITIES LOCATED IN EXISTING APARTMENT BUILDINGS

Stories in Height	Control Requirement (S_a)	Egress Requirement (S_b)	Refuge Requirement (S_c)	General Fire Safety Requirement (S_d)
1 Story	9	7.5	6	11
2 Stories	10.5	7.5	7	12
≥3 Stories	12.5	7.5	9	14

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Apts.) (p. 3 of 4)

FIGURE 7.7 *Continued*

WORKSHEET 7.7.5 EQUIVALENCY EVALUATION

						Yes	No
Control Provided (S_1)	minus	Required Control (S_a)	≥	0	S_1 ☐ – S_a ☐ = ☐		
Egress Provided (S_2)	minus	Required Egress (S_b)	≥	0	S_2 ☐ – S_b ☐ = ☐		
Refuge Provided (S_3)	minus	Required Refuge (S_c)	≥	0	S_3 ☐ – S_c ☐ = ☐		
General Fire Safety (S_4)	minus	Required Gen. Fire Safety (S_d)	≥	0	S_4 ☐ – S_d ☐ = ☐		

WORKSHEET 7.7.6 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

	Considerations	Met	Not Met	Not Applic.
A.	Utilities comply with the provisions of 32.3.6.1 and 33.3.6.1.			☒
B.	Heating, ventilating, and air conditioning equipment comply with the provisions of 32.3.6.2 and 33.3.6.2, except for enclosure of vertical openings, which have been considered in Safety Parameter 10 of Worksheet 7.7.2.			☒
C.	Elevators, dumbwaiters, and vertical conveyors comply with the provisions of 32.3.6.3 and 33.3.6.3.			
D.	Rubbish chutes, incinerators, and laundry chutes comply with the provisions of 32.3.6.4 and 33.3.6.4.			☒
E.	Complies with the applicable requirements of Sections 32.7 and 33.7.			

All references are to NFPA *101*, *Life Safety Code.*

WORKSHEET 7.7.7 CONCLUSIONS

1. ☐ All of the checks in Worksheet 7.7.5 are in the "Yes" column and all applicable considerations in Worksheet 7.7.6 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for an apartment building to house residential board and care occupancies.

2. ☐ All of the checks in Worksheet 7.7.5 are in the "Yes" column and all considerations identified in Worksheet 7.7.6 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for an apartment building to house residential board and care occupancies.

3. ☐ One or more of the checks in Worksheet 7.7.5 are in the "No" column or any consideration identified in Worksheet 7.7.6 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for an apartment building to house residential board and care occupancies.

(For use with NFPA 101A-2013/NFPA *101*-2012, B & C Apts.) (p. 4 of 4)

FIGURE 7.7 ***Continued***

▲ Chapter 8 Fire Safety Evaluation System for Business Occupancies

8.1 Introduction.

▲ **8.1.1** This chapter is part of an NFPA guide and, therefore, is not mandatory. The term *shall* in this chapter is used to indicate that if the provisions of the chapter are applied, the procedures mandated are to be followed to ensure the effectiveness of the evaluation system.

▲ **8.1.2** The Fire Safety Evaluation System (FSES) is a measuring system. It compares the level of safety provided by an arrangement of safeguards that differ from those specified in NFPA *101*, *Life Safety Code*, to the level of safety provided in a building that conforms exactly with the details of the *Code*.

8.1.3 This chapter is provided to assist in completion of Figure 8.6, Worksheets for Evaluating Fire Safety in Business Occupancies. The step-by-step instructions for completion appear in the text of Section 8.6. This chapter provides expanded discussion and definition of the various items in the worksheet to assist the user when questions of definitions or interpretation arise. The chapter is organized to follow the format of the worksheet progressively.

8.2 Procedure for Determining Equivalency.

▲ **8.2.1** Evaluate the factors affecting either every fire zone or the building as a whole using Figure 8.6, Worksheets for Evaluating Fire Safety in Business Occupancies.

8.2.1.1 Zoning must divide the building into units that consist of one or more complete fire/smoke zones. A fire/smoke zone is a portion of a building that is separated from all other portions of the building by vertical or horizontal fire barriers having at least a 1-hour fire resistance rating or vertical smoke barriers conforming to the requirements of Section 8.5 (NFPA *101*), or a combination of both. Any vertical openings (shafts, stairs) involved also must provide 1-hour separation. In facilities completely protected by automatic sprinkler protection, these fire resistance requirements do not apply. The elements separating one zone from another, however, must be of sound- and smoke-resisting construction. Doors in zone separations must be either self-closing or equipped with automatic closers operated by smoke detectors.

8.2.1.2 Zones shall be permitted to be either adjacent to each other (e.g., separate wings or building sections) or above each other (e.g., floors or groups of floors).

8.2.1.3 Each zone containing spaces used for business occupancy can be evaluated using this system.

8.2.1.4 Each of the safety parameters is to be analyzed, and the safety value for each parameter that best describes the condition in the building is to be identified.

8.2.2 Using the Facility Fire Safety Requirements Worksheet (Worksheet 8.6.6), determine the acceptability of the general building systems (utilities, HVAC, elevator installations, standpipes and fire extinguishers, and rubbish chutes, incinerators, and laundry chute installations).

8.2.3 Equivalency is achieved if the building or fire/smoke zone evaluations show equivalency or better in each and every zone and the requirements of the Facility Fire Safety Requirements Worksheet (Worksheet 8.6.6) are met.

8.3 Glossary for Fire Safety Evaluation Worksheet for Business Occupancies.

8.3.1 Introduction. This glossary is provided to assist in completing the Worksheets for Evaluating Fire Safety in Business Occupancies. This glossary provides expanded discussion and definitions for the various items in the worksheets to assist the user where questions of definition or interpretation arise. To the maximum extent possible, the glossary does not repeat the definitions already existing in NFPA *101*, *Life Safety Code*, but rather references the appropriate paragraphs in NFPA *101*.

8.3.2 Areas of Application.

▲ **8.3.2.1** The entire building can be evaluated on a single set of worksheets. The building might, however, be zoned by considering each zone separately or by using any convenient grouping of zones.

8.3.2.1.1 Charges for Safety Parameter 2, "Segregation of Hazards," in Worksheet 8.6.2, apply to any hazardous area in the zone being evaluated and to any hazardous area in zones adjacent to or below the zone being evaluated.

8.3.2.1.2 Where zones are located above each other, the value assigned to Parameter 1, "Construction," in Worksheet 8.6.2, in each zone is based on the highest story used for regular human occupancy in that "stack of zones" and the type of construction for that stack of zones.

8.3.2.1.3 The assignment of values for Safety Parameter 5, "Fire Alarm"; Parameter 9, "Exit Access"; and Parameter 10, "Egress Route," in Worksheet 8.6.2, does not consider conditions in unoccupied spaces in other zones where such are not involved in any egress paths.

8.3.2.1.4 The evaluation of Safety Parameter 10, "Egress Route," in Worksheet 8.6.2, includes those portions of any egress route that serve the zone being evaluated. Any exposures or deficiencies pertaining to any part of the egress route must be taken into account in the evaluation of the zone.

8.3.2.2 Zones that do not involve regular human occupancy are evaluated the same as those with regular human occupancy, with the following variations:

(1) Any such zone shall be permitted to be omitted from the numerical evaluation if both of the following conditions are met:
   (a) The zone is not involved in the egress route from any space with regular human occupancy.
   (b) The zone conforms to NFPA *101*, *Life Safety Code*, requirements applicable to its use.

(2) Alternatively, such zones shall be permitted to be evaluated using this system, on the condition that any additional egress capabilities and arrangements appropriate to the specific use of the space are provided.

▲ **8.4 Maintenance.** All protection systems, requirements, arrangements, and procedures shall be maintained in a dependable operating condition and a sufficient state of readiness and shall be used in such a manner that the intended safety function or hazard constraint is not impaired. Otherwise, they shall receive no credit in the evaluation.

8.5 Safety Parameters (Worksheet 8.6.2). The safety parameters are a measure of those building factors that bear on or contribute to the safety of those persons who might be in the building at the time of a fire. The safety parameters in Worksheet 8.6.2 are described in the following subsections.

▲ **8.5.1 Construction.** Construction types are classified in accordance with the definitions of NFPA 220, *Standard on Types of Building Construction*. Where the facility includes additions or connected structures of different construction, the rating and classification of the structure is based on one of the following:

(1) Separate buildings where the separation between the portions of the building is a fire barrier having at least a 1-hour fire resistance rating and any opening protectives have at least a 45-minute fire protection rating
(2) The lower safety parameter point score involved where such a separation does not exist

▲ **8.5.2 Segregation of Hazards.** The assignment of charges for unsegregated hazardous areas is a four-step process.

▲ **8.5.2.1 Step 1 — Identify Hazardous Areas.** A hazardous area is any space or compartment in which a storage or other activity exists that is not a part of normal office space arrangements and that possesses the potential for producing a fully involved fire.

▲ **8.5.2.2 Step 2 — Determine the Level of Hazard.**

8.5.2.2.1 There are two levels of hazard: structurally endangering and not structurally endangering.

8.5.2.2.1.1 Structurally Endangering. A hazardous area with a potential fire severity that might exceed the tested resistance of the enclosure and defeat the basic structural integrity of the building framing as defined in Safety Parameter 1, "Construction," of Worksheet 8.6.2. *[See Figure 8.5.2.2.1.1 for determining approximate potential fire severity.]*

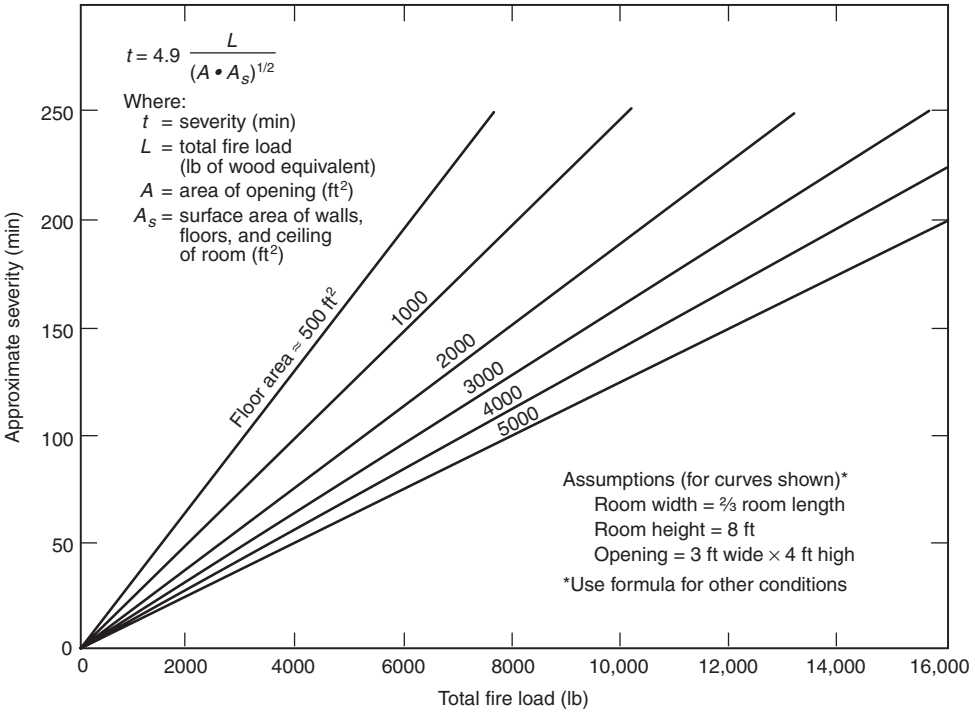
8.5.2.2.1.2 Not Structurally Endangering. A hazardous area with sufficient fire potential to build to full involvement (flashover) and present a danger of propagating through openings or wall partitions but not possessing sufficient total potential to endanger the structural framing or floor decking as defined in Safety Parameter 1 of Worksheet 8.6.2. *[See Figure 8.5.2.2.1.2 for assistance in estimating the fire size needed to flash over the area containing various combustible contents.]*

8.5.2.2.2 Example of Structurally Endangering. For a room 20 ft × 30 ft × 8 ft high (6.1 m × 9.1 m × 2.4 m high) with a (window) opening 3 ft wide × 4 ft high (0.9 m wide × 1.4 m high), 3000 lb (1361 kg) of ordinary fuel can produce a fire severity of approximately 95 minutes. If the fire resistance of the hazardous area enclosure is less than 95 minutes and the fire is likely to continue to its estimated duration, the hazardous area shall be permitted to be classed as structurally endangering.

▲ **8.5.2.3 Step 3 — Determine the Fire Protection Provided.**

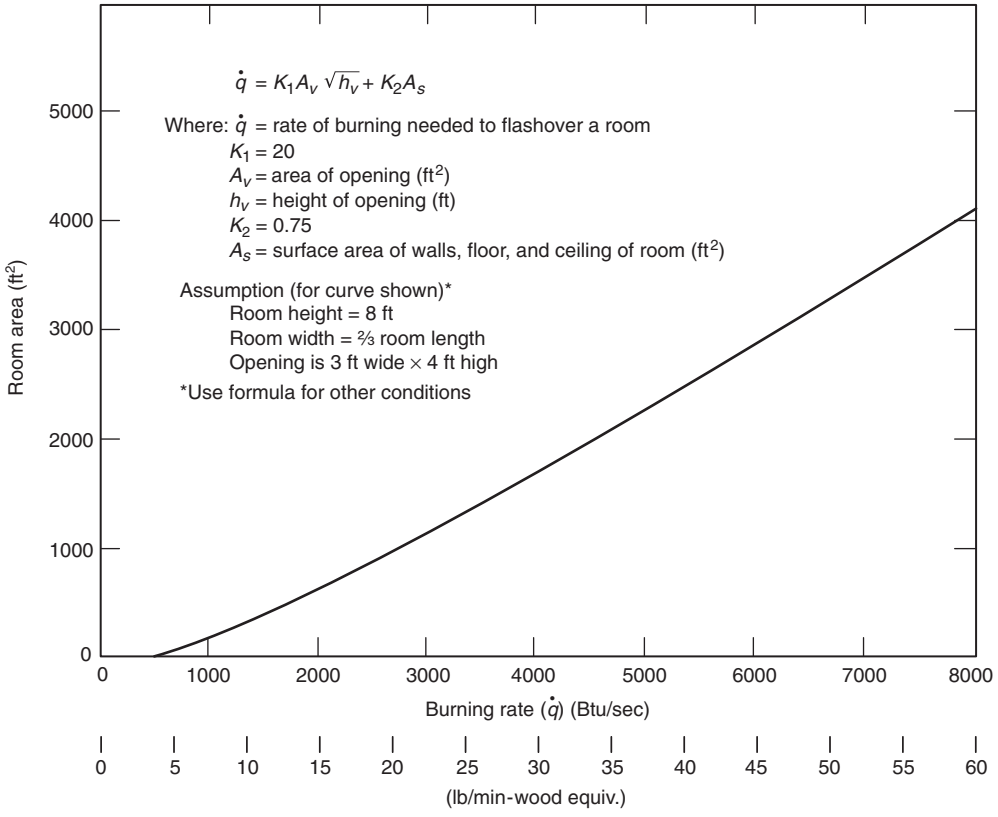
8.5.2.3.1 The parameter value for hazardous areas is based on the presence or absence of the fire protection necessary to control or confine the hazard. Two different types of fire protection are considered. The first consists of automatic sprinklers or other appropriate extinguishing systems covering the entire hazard. The credit for sprinklers shall not be given unless the hazardous area is separated from the rest of human occupancy or the egress route by reasonably smoke-resistant partitions and doors. The second is a complete fire enclosure having a sufficient fire resistance rating to contain the potential fire severity of the hazardous area. This includes the following:

(1) The separation of the hazardous area from any structural framing members
(2) Partitions separating the hazardous area from all other spaces
(3) Fire protection–rated doors sufficient to exceed the potential of the fire load involved



For SI units, 1 lb = 0.4536 kg; 1 ft = 0.3048 m; 1 ft² = 0.0929 m².

FIGURE 8.5.2.2.1.1 Approximate Fire Severity.



For SI units, 1 lb = 0.4536 kg; 1 ft = 0.3048 m; 1 ft² = 0.0929 m²; 1 Btu/sec = 1.055 kW.

FIGURE 8.5.2.2.1.2 Approximate Flashover Energy.

8.5.2.3.2 Any hazardous space that has any of these protection systems is classified as having single protection.

▲ **8.5.2.4 Step 4 — Determine Degree of Deficiency and Assign Parameter Values.**

8.5.2.4.1 The parameter value ultimately is determined by the degree of the deficiency of the hazardous area based on the level of protection needed. Table 8.5.2.4.1 provides a matrix to be used for determining the degree of deficiency to be assessed.

8.5.2.4.2 In some situations, more than one hazardous area with the same or differing levels of deficiency exists. The overall charge is based on the single most serious deficiency for the hazardous area.

8.5.2.4.3 Open-Plan Office Space.

8.5.2.4.3.1 A sprinkler-protected open-plan office space is not considered a hazardous space.

8.5.2.4.3.2 An unsprinklered open-plan office space is not considered a hazardous space unless it involves such a collection of fuel that flashover is likely to occur. This can be estimated in the following manner:

(1) Appraise the largest fuel concentrations. A fuel concentration is a collection of combustible materials (desks, files, or other material or items) that is separated from other fuel concentrations by a clear space that is 24 in. (610 mm) wide or one-half the height of the collection, whichever is greater. Floor covering is not considered in this estimate.

Table 8.5.2.4.1 Segregation of Hazards — Degree of Deficiency

	No protection	Sprinkler protection	Fire resistance–rated enclosure*	Sprinklered and fire resistance–rated enclosure*
Not structurally endangering	Single deficiency	No deficiency		
Structurally endangering	Double deficiency	Single deficiency	No deficiency	

*Complete enclosure having sufficient fire resistance to contain the potential of the hazardous contents area.

(2) The burning rate is based on the best available data. If test data are available, use those data; otherwise use Table 8.5.2.4.3.2. If data are not available and Table 8.5.2.4.3.2 is not sufficient, the burning rate is based on 125 Btu/sec · ft^2 of actual fuel-covered floor space for typical wooden desk modules. Ignore space occupied by metal desks or metal file cabinets. For open-shelf storage or similar piled or stacked concentrations of combustible materials, estimate 100 Btu/sec · ft^2 of covered floor space for each foot of height of combustible material. Double these figures for the portion of the fuel assembly that is foamed plastic.

Table 8.5.2.4.3.2 Some Typical Peak Rates of Heat Release

Btu/sec · ft^2	Growth Rate[b]	Potential Fuel
1.5	S	Fire retardant–treated mattress (including normal bedding)
15[a]	M	Lightweight Type C upholstered furniture[c]
35[a]	S	Moderate weight Type C upholstered furniture[c]
35	F	Mail bags (full) stored 5 ft high
50[a]	M	Cotton/polyester innerspring mattress (including bedding)
60[a]	M	Lightweight Type B upholstered furniture[c]
60[a]	S	Medium weight Type C upholstered furniture[c]
65[a]	VF	Methyl alcohol pool fire
70[a]	S	Heavy weight Type C upholstered furniture[c]
80[a]	F	Polyurethane innerspring mattress (including bedding)
90[a]	M	Moderate weight Type B upholstered furniture[c]
125	M	Wooden pallets 1½ ft high
145[a]	M	Medium weight Type B upholstered furniture[c]
150[a]	F	Lightweight Type A upholstered furniture[c]
150	F	Empty cartons 15 ft high
175[a]	M	Heavy weight Type B upholstered furniture[c]
175	F	Diesel oil pool fire (> about 3 ft diameter)
175	VF	Cartons containing polyethylene bottles 15 ft high
220[a]	F	Moderate weight Type A upholstered furniture[c]
225[a]	F	Particleboard wardrobe/chest of drawers
290	VF	Gasoline pool fire (> about 3 ft diameter)
340[a]	VF	Thin plywood wardrobe with fire-retardant paint on all surfaces (50 in. × 24 in. × 72 in. high)
350	F	Wooden pallets 5 ft high
360[a]	F	Medium weight Type A upholstered furniture[c]
450[a]	F	Heavy weight Type A upholstered furniture[c]
600[a]	VF	Thin plywood wardrobe (50 in. × 24 in. × 72 in. high)

For SI units, (Btu/sec)/ft^2 = 11.35 kW/m^2; 1 in. = 25.4 mm; 1 Btu/sec = 1.055 kW; 1 ft = 0.3048 m; 1 lb = 0.4536 kg; 1 ft^2 = 0.0929 m^2.

[a]Peak rates of heat release were of short duration. These fuels typically showed a rapid rise to the peak and a corresponding rapid decline. In each case, the fuel package tested consisted of a single item.

[b]Growth Rates:

S — Slow: Burning rate in the range of a *t*-squared fire that reaches 1000 Btu/sec in 600 seconds.

M — Moderate: Burning rate in the range of a *t*-squared fire that reaches 1000 Btu/sec in 300 seconds.

F — Fast: Burning rate in the range of a *t*-squared fire that reaches 1000 Btu/sec in 150 seconds.

VF — Very Fast: Burning rate in the range of a *t*-squared fire that reaches 1000 Btu/sec in 75 seconds.

[c]The classification system used to describe upholstered furniture is as follows:

Lightweight — Less than about 5 lb/ft^2 of floor area. A typical 6 ft long couch weighs under 75 lb.

Moderate weight — About 5 lb/ft^2 to 10 lb/ft^2 of floor area. A typical 6 ft long couch weighs between 75 lb and 150 lb.

Medium weight — About 10 lb/ft^2 to 15 lb/ft^2 of floor area. A typical 6 ft long couch weighs between 150 lb and 300 lb.

Heavy weight — More than about 15 lb/ft^2 of floor area. A typical 6 ft long couch weighs over 300 lb.

Type A — Furniture with untreated or lightly treated foam plastic padding and nylon or other melting fabric.

Type B — Furniture with untreated or lightly treated foam plastic padding or with nylon or other melting fabric, but not both.

Type C — Furniture with cotton or heavily treated foam plastic padding and having cotton or other fabric that resists melting.

The estimated heat release rates are based on furniture having simple lines. For ornate or convoluted shapes, increase the indicated rates by up to 50 percent based on elaborateness.

Additional potential fuel heat release information can be found in *NFPA 72, National Fire Alarm and Signaling Code*; NFPA 204, *Standard for Smoke and Heat Venting*; the *SFPE Handbook of Fire Protection Engineering*; and other references.

(3) Based on the estimated burning rate, appraise the flashover potential. Use Figure 8.5.2.2.1.1.
(4) If flashover is shown as a potential, use Figure 8.5.2.2.1.2 to appraise severity, classify the space as a hazardous area, and assign charges, as appropriate.

▲ **8.5.3 Vertical Openings.** These values apply to vertical openings and penetrations including exit stairways, ramps, and any other vertical exits, pipe shafts, ventilation shafts, duct penetrations, and laundry and incinerator chutes. The charge for vertical openings is based on the fire resistance of the enclosure, if provided. Where the protection of vertical openings (other than exits) meets the requirements of 38.3.1 and 39.3.1 (NFPA *101*), the parameter is assessed on the basis of "Enclosed, >1 hr" for new buildings >75 ft in height, and "Enclosed, 30 min to 1 hr" for all other buildings.

8.5.3.1 A vertical opening or penetration is classified as open if it has any of the following characteristics:

(1) Unenclosed
(2) Enclosed but has doorways (or similar portals) that are without doors
(3) Enclosed but has unprotected openings other than doorways
(4) Enclosed with cloth, paper, or similar materials without any sustained firestopping capabilities

8.5.3.2 The credit for vertical opening protection varies depending on the number of stories connected by the vertical opening and the degree of enclosure.

▲ **8.5.4 Sprinklers.**

8.5.4.1 Where an automatic sprinkler is installed for either total or partial building coverage, the system shall be in accordance with the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*.

8.5.4.2 To receive credit for protection, the sprinkler system must be equipped with an automatic alarm initiating device that activates the building manual fire alarm system or otherwise sounds an alarm sufficiently audible to be heard in all occupied areas.

8.5.4.3 To receive credit for "total building" sprinkler protection, the entire building must be provided with sprinkler coverage and that coverage must cover all zones of the building.

▲ **8.5.5 Fire Alarm.** Fire alarms are defined in 8.5.5.1 through 8.5.5.4.

8.5.5.1 None. There is no fire alarm system, or the system is incomplete and does not meet the requirements for a higher-scored category.

8.5.5.2 Without Fire Department Notification (W/O F.D. Notification). There is a fire alarm system that meets the requirements of Section 9.6 (NFPA *101*).

8.5.5.3 With Fire Department Notification (W/ F.D. Notification). There is a fire alarm system that complies with the requirements of 8.5.5.2 and, in addition, automatically transmits a signal to the fire department that is committed to serve the area in which the building is located through a direct connection, an approved central station, or other acceptable means.

8.5.5.4 With Voice Communication. There is a fire alarm system with voice alarm in accordance with 11.8.4 (NFPA *101*).

▲ **8.5.6 Smoke Detection.**

8.5.6.1 All references to detectors herein refer to smoke detectors. No credit is given for heat detectors in habitable space except as specifically noted in 8.5.6.2 through 8.5.6.5. Heat detectors can be credited in uninhabitable spaces where ambient temperatures can be expected to reach 120°F (50°C) or fall below 0°F (–18°C), provided separation from inhabited spaces is at least ½-hour fire resistance–rated.

8.5.6.2 To meet the requirements for smoke detector coverage, the spaces must be provided with smoke detectors installed in accordance with *NFPA 72, National Fire Alarm and Signaling Code*.

8.5.6.3 Only those detectors whose activation will sound the alarm throughout the zone of origin are to be credited in this parameter.

8.5.6.4 If the building is evaluated by zones as defined in 8.3.2, the evaluation is based solely on detection within the zone.

8.5.6.5 To receive credit for smoke detection in corridors only, all corridors in the building or zone must have smoke detectors.

▲ **8.5.7 Interior Finish.**

8.5.7.1 Classification of interior finish is based on the flame-spread rating of the interior finish tested in accordance with ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*. The requirements apply to wall and ceiling finish materials as described in Section 10.2 (NFPA *101*).

8.5.7.2 No consideration is included in the safety parameter value for any finish with a flame-spread rating of more than 200 or for any finish not rationally measured by ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*. Thus, this FSES should not be used where such conditions exist. Such materials include foamed plastics; asphalt-impregnated paper; materials that melt, drip, or delaminate; or those capable of inducing extreme rates of fire growth and rapid flashover. In any case involving these materials, the resultant risk is considered beyond the capacity of this evaluation system and requires individual appraisal.

8.5.7.3 Interior wall and ceiling finish materials tested in accordance with NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, or NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, as permitted by Section 10.2 (NFPA *101*), and meeting the criteria established in Section 10.2 (NFPA *101*) for those test standards, shall be scored as Class A interior finish materials (flame spread ≤25).

8.5.7.4 Any interior finish having a flame spread of 75 or less that is protected by automatic sprinklers is evaluated as having a flame spread not exceeding 25. Any interior finish having a flame spread of more than 75 but not more than 200 that is protected by automatic sprinklers is evaluated as having a flame spread not exceeding 75.

▲ **8.5.8 Smoke Control.** Smoke control definitions are provided in 8.5.8.1 through 8.5.8.2.2.

8.5.8.1 No Control. There are no smoke barriers or horizontal exits to a separated fire/smoke zone on the floor and no mechanically assisted smoke control systems serve the floor.

8.5.8.2 Smoke Barriers. Smoke barriers consist of installations conforming to the requirements of Section 8.5 (NFPA *101*).

8.5.8.2.1 Passive. The smoke control system is passive if it consists of continuous vertical membranes designed to restrict the movement of smoke. Passive smoke barriers might or might not have a fire resistance rating and might have protected openings.

8.5.8.2.2 Active. The smoke control system is active if it has a tested and accepted smoke control system that obstructs the leakage of smoke between compartments or zones. One method of judging acceptance of smoke control systems is contained in NFPA 92, *Standard for Smoke Control Systems.*

▲ **8.5.9 Exit Access.**

8.5.9.1 The charge for dead-end access is made where any corridor affords access in only one direction to a required exit.

8.5.9.2 If dead-end distances exceed 100 ft (30 m), a separate analysis must be made to evaluate the potential of flashover of any spaces that could block egress from the dead end and to determine the potential rate of smoke-filling of the egress system involved. If the safe time is shorter than the expected egress time, the evaluation should be discontinued unless a corrective action is specified.

8.5.9.3 The 50 ft (15 m) dead-end limit is applicable to existing buildings or new fully sprinklered buildings. A value of 20 ft (6.1 m) should be used for other new buildings.

8.5.9.4 Any system with common path of travel in excess of that permitted by NFPA *101* should be considered deficient under Safety Parameter 10, "Egress Route."

▲ **8.5.10 Egress Route.**

8.5.10.1 Egress routes are the paths of travel from any point within a room to the public way using any types and arrangements described in Sections 38.2 or 39.2 (NFPA *101*).

8.5.10.2 Egress routes are defined in 8.5.10.2.1 through 8.5.10.2.5.

8.5.10.2.1 Single Egress Route. A single egress route exists where the occupants on any floor do not have either a direct exit to the public way or multiple egress routes as defined in 8.5.10.2.2.

8.5.10.2.2 Multiple Egress Routes. Multiple egress routes exist where the occupants on a floor have a choice of at least two separate means of egress routes to the public way using the permitted types in Sections 38.2 or 39.2 (NFPA *101*).

8.5.10.2.3 Deficient — Multiple Routes. An egress route is deficient if it fails to meet any of the applicable criteria of NFPA *101*, *Life Safety Code*, including capacity. Any system with a common path of travel in excess of that permitted by NFPA *101* should be considered deficient under Parameter 10, "Egress Route."

8.5.10.2.4 Smokeproof Enclosure. Credit for a smokeproof enclosure shall be permitted to be given for a stairway designed and tested in accordance with the requirements of 7.2.3 (NFPA *101*) for a smokeproof enclosure. To receive credit for a smokeproof enclosure, all exit stairs credited in Safety Parameter 10, "Egress Route," shall meet the smokeproof enclosure requirements.

8.5.10.2.5 Direct Exit. To be credited for direct exits, each room shall have within that unit a door that opens to the exterior at grade level or onto an exterior balcony with direct access to an exterior exit. Where such openings are directly onto grade in a location where any person egressing can move directly away from the building without further exposure, the credit for direct exit shall be given even if there are no other exit routes from the space.

▲ **8.5.11 Corridor/Room Separation.** The values assigned in Safety Parameter 11, "Corridor/Room Separation," are based on the quality of separation between the room and the corridor. For purposes of this evaluation, corridor separation in new buildings is considered as complete (i.e., 1 hour with door closer) if it meets the requirements of 38.3.6 (NFPA *101*).

8.5.11.1 Corridor/room separation is defined in 8.5.11.1.1 through 8.5.11.1.3.

8.5.11.1.1 Incomplete.

8.5.11.1.1.1 The separation is judged as "incomplete" if the wall to the corridor has unprotected openings (no door, or there are louvers, gaps, or transfer grilles) between the floor and ceiling. If openings exist above the ceiling level, the separation is considered complete if the ceiling in the room is a completed membrane. In this case, the separation rating is based on the level of resistance involved in the wall/ceiling system.

8.5.11.1.1.2 The score for incomplete separation is based on the potential time that at least the lower 5 ft (1.5 m) of the corridor could be expected to remain free of smoke if a fully involved fire were to occur in an exposing room. This is dependent on the amount of leakage from the exposing room with the greatest leakage and the size of the corridor *(see Figure 8.5.11.1.1.2)*. The scores are shown in Table 8.5.11.1.1.2.

8.5.11.1.2 Complete Separation. The separation, if not judged to be "incomplete" based on the criteria in Table 8.5.11.1.1.2, is considered "complete."

8.5.11.1.3 No Separation. There is "no separation" if the floor or the smoke zone is not subdivided (i.e., there is no corridor leading to an exit). *[See 38.3.6.1(1) through 38.3.6.1(3) (NFPA 101).]*

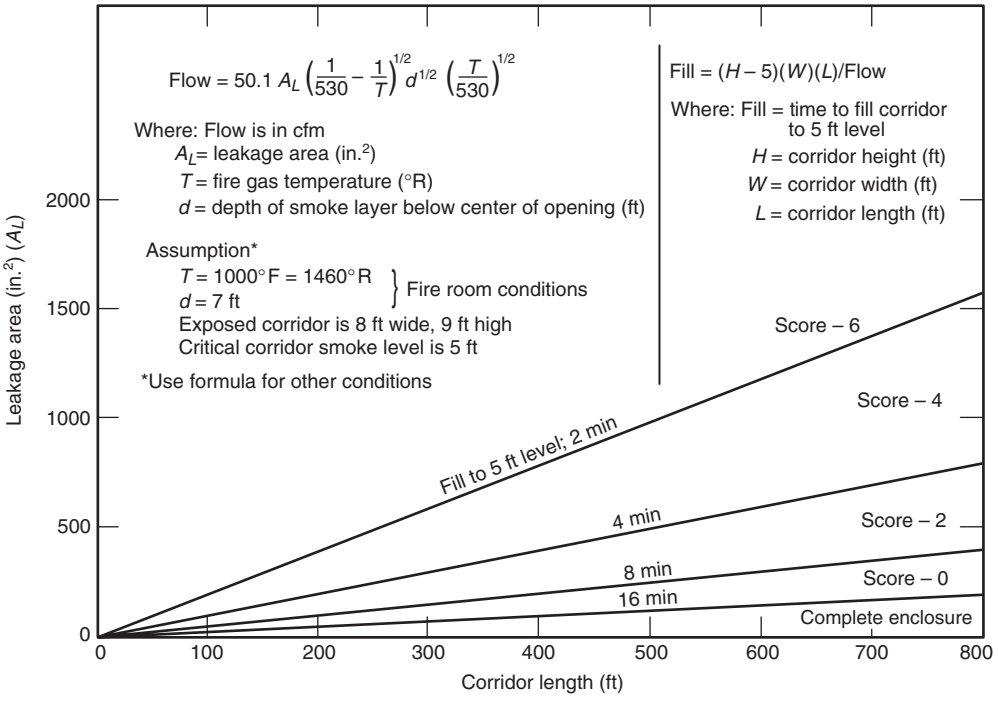
8.5.11.2 For information on credit for door closers, "smoke resistive" versus "≥½ hr" or "1 hr," see Note e to Worksheet 8.6.2.

▲ **8.5.12 Occupant Emergency Program.**

8.5.12.1 The value of this parameter is determined by the number of fire exit drills conducted in the building each year. If no fire exit drills are conducted, the parameter is assessed a value of –2. If drills are conducted once or twice a year, the value is zero (0). If drills are conducted more than twice a year, this parameter is given a value of 1. If the building occupant load is fewer than 500 persons with fewer than 100 persons above or below the street level, this parameter should be given, as a minimum, a value of 1.

8.5.12.2 To qualify for credit, a majority of the building or zone occupants must take part in scenario-oriented fire exit drills. The scenarios should be based on the hazardous conditions that could develop during a fire in the facility.

8.5.12.3 The fire exit drills should be conducted in accordance with the appropriate provisions of NFPA *101*, *Life Safety Code*.



For SI units, 1 in.^{2} = 6.452 cm^2; 1 ft = 0.3048 m; $\frac{5}{9}$ (°F – 32) = °C.

FIGURE 8.5.11.1.1.2 Approximate Time to Smoke Impact.

Table 8.5.11.1.1.2 Incomplete Separation Scores

Safe Time (min)	Score
<2	–6
≥2 but <4	–4
≥4 but <8	–2
≥8 but <16	0
≥16	Complete separation

▲ **8.6 Worksheets for Evaluating Fire Safety in Business Occupancies.** The worksheets for evaluating fire safety use a five-step process found in Figure 8.6.

▲ **8.6.1 Step 1 — Complete the Cover Sheet Using Worksheet 8.6.1.** See Figure 8.6.

▲ **8.6.2 Step 2 — Determine Individual Safety Evaluations Using Worksheet 8.6.2.** The following steps should be taken:

(1) Select and circle the safety value for each parameter in Worksheet 8.6.2 that best describes the conditions in the facility. Only one value for each of the parameters is to be chosen. If two or more values appear to apply, the one with the lowest point value governs.
(2) Transfer each of the 12 circled safety parameter values from Worksheet 8.6.2 to the available blocks corresponding to each safety parameter in Worksheet 8.6.3. Where the blocks indicate "÷ 2 =," enter one-half the value from Worksheet 8.6.2.
(3) Add each of the three columns, keeping in mind that any negative numbers need to be deducted.
(4) Transfer the resulting values for S_1, S_2, and S_3 to Worksheet 8.6.5.

▲ **8.6.3 Step 3 — Determine Mandatory Requirements Using Worksheet 8.6.4.** The following steps should be taken:

(1) Circle the mandatory values in Worksheet 8.6.4 for the building being evaluated.
(2) Transfer the circled values from Worksheet 8.6.4 to the boxes marked S_a, S_b, and S_c in Worksheet 8.6.5.

▲ **8.6.4 Step 4 — Evaluate Fire Safety Equivalency Using Worksheet 8.6.5.** The following steps should be taken:

(1) Perform the subtractions indicated in Worksheet 8.6.5. Enter the differences in the appropriate boxes.
(2) For each row, check "yes" if the value in the answer box is zero (0) or greater. Check "no" if the value in the answer box is negative.

▲ **8.6.5 Step 5 – Evaluate Other Considerations Not Previously Addressed, Using Worksheet 8.6.6.** The equivalency covered by Worksheets 8.6.2 through 8.6.5 includes the majority of the considerations covered by the *Life Safety Code*. Some considerations are not evaluated by this method and must be considered separately. These additional considerations are covered in Worksheet 8.6.6, Facility Fire Safety Requirements Worksheet. Complete one copy of this separate worksheet for each facility.

▲ **8.6.6 Step 6— Determine Equivalency Conclusion.** Conclude whether the level of life safety is at least equivalent to that prescribed by the *Life Safety Code*, using Worksheet 8.6.7, Conclusions. Worksheet 8.6.7 combines the fire safety equivalency evaluation of Worksheet 8.6.5 and the additional considerations of Worksheet 8.6.6.

WORKSHEET 8.6.1 COVER SHEET

Fire Safety Evaluation Worksheet for Business Occupancies

Facility Identification _____

Evaluator _____ Date _____

Notes:

▲ WORKSHEET 8.6.2 SAFETY PARAMETERS

Safety Parameters	Parameter Values							
1. Construction	Noncombustible			Combustible				
NFPA 220 Bldg. Constr. Types/Stories in Height	Type I (442) or (332) Type II(222)	Type II (111)	Type II (000)	Type III (211)	(200)	Type IV (2HH)	Type V (111)	(000)
1–2 Stories	0	0	0	0	–1	0	0	–1
3 Stories	2	2	–6	0	–6	0	0	–12
4–5 Stories but ≤75 ft	2	2	–10	0	–12	0	–3	–12
>5 Stories but ≤75 ft	2	2	NV	0	NV	0	–6	NV
>75 ft but <150 ft	2	–1	NV	0	NV	0	NV	NV
≥150 ft	2	NV	NV	0	NV	0	NV	NV

2. Segregation of Hazards	Exposed Exit System		Segregation from Exit Routes		None or No Deficiencies
	Double Def.	Single Def.	Double Def.	Single Def.	
	–7	–4	–4	0	0

3. Vertical Openings[a]	Open (or incomplete enclosure)				Enclosed		
	Connects 5 or More Floors	4 Flrs.	3 Flrs.	2 Flrs.	<30 min	30 min to 1 hr	>1 hr[g]
	–10	–7	–4	–2	–1	0	1

4. Sprinklers		Corridors Only	All but Corridors and Lobbies		Total Building	
	None		Standard	Fast Resp.	Standard	Fast Resp.
	0	0	4	6	10	12

5. Fire Alarm		W/O F. D. Notification		W/ F. D. Notification	
	None	W/O Voice Commun.	W/ Voice Commun.	W/O Voice Commun.	W/ Voice Commun.
	0 (–2)[k]	1(0)[k] (–1)[p]	2(0)[p]	2(1)[k] (–1)[p]	4(2)[p]

(Worksheet 8.6.2 continues)

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

FIGURE 8.6 Worksheets for Evaluating Fire Safety in Business Occupancies.

Worksheet 8.6.2 ***Continued***

6. Smoke Detection	None		Corridor		Rooms		Total Bldg. (zone)
	0		1		2		4
7. Interior Finish	Flame-Spread Ratings[b]						
Exit Routes	>75 to ≤200		>25 to ≤75		≤25		
Rooms/Suites	>75 to ≤200	≤75	>75 to ≤200	≤75	>25 to ≤200	≤25	
	–3	–1	0	1	1	2	
8. Smoke Control	None		Passive		Active		
	0		3		4(3)[j]		
9. Exit Access	Max. Dead Ends			No Dead End >50 ft and Travel Is			
	>75 ft to ≤100 ft	>50 ft (20 ft)[h] to ≤75 ft		>200 ft[c] to <400 ft	>100 ft to 200 ft[c]	>50 ft to 100 ft	≤50 ft
	–2[d]	–1		–1	0	1	3
10. Egress Route	Single	Multiple Routes				Direct Exits	
		Deficient	Not Deficient	Smokeproof Enclosures			
	–6(0)[i]	–2	0	3		5	
11. Corridor/Room Separation (compartmentation)	Separation Exists and Level of Protection Is						No Separation, or Single Tenant, or Parameter 4 Value ≥10
	Incomplete	Smoke Resistive[e]		≥½ hr [e]		≥1 hr[e]	
		W/O Door Closer	W/Door Closer	W/O Door Closer	W/Door Closer	W/Door Closer	
	–6 to 0[l]	0	1(2)[f]	1	2(3)[f]	3(4)[f]	3
12. Occupant Emergency Program	Number of Fire Drills Conducted Per Year						
	0		1 to 2		>2		
	–2(–3)[m]		0(1)[n]		1(2)[n]		

NV – Where these conditions exist, this FSES does not evaluate overall safety. Other analysis techniques shall be permitted to be applied in accordance with the equivalency concept of Section 1.4 of NFPA *101*, *Life Safety Code*.

[a] Use 0 if building is one level.

[b] In any sprinkler-protected spaces, consider flame-spread rating to be 25 or 75 if the interior finish material flame spread does not exceed 75 or 200, respectively.

[c] Increase 200 to 300 if Parameter 4 is 10 or more.

[d] Use 0 if Parameter 11 is –6.

[e] Rate separation as ½ hr (or use actual separation, if greater) if Parameter 4 is 10 or more. Rate separation as "smoke resistive" if Parameter 1 is based on construction Type II(000), III(200), or V(000) and Parameter 4 value < 10.

[f] Use ( ) if separation between rooms also meets criteria.

[g] Use only if all vertical openings have more than 1-hr enclosure and meet the requirements of 7.1.3 and 38.3.1 or 39.3.1 (NFPA *101*).

[h] Use 50 ft for existing buildings and 20 ft for new construction.

[i] Use ( ) for single exit in accordance with 38.2.4 and 39.2.4 (NFPA *101*).

[j] Use (3) if Parameter 4 value <10.

[k] Use ( ) for building that has:
(a) ≥2 stories above level of exit discharge, or
(b) Occupant load ≥50 (≥100 in existing buildings) above or below level of exit discharge, or
(c) Total occupant load ≥300 (≥1,000 in existing buildings).

[l] See 8.5.11.1.1 for guidance.

[m] Use ( ) in buildings over 150 ft in height with no formal occupant emergency organization program.

[n] Use ( ) in any building, regardless of height, with a formal occupant emergency organization program.

[p] Use ( ) for new high-rise buildings.

For SI units, 1 ft = 0.3048 m; 1 ft² = 0.092 m².

FIGURE 8.6 ***Continued***

WORKSHEET 8.6.3 INDIVIDUAL SAFETY EVALUATION

Safety Parameters	Fire Control (S_1)	Egress Provided (S_2)	General Fire Safety Provided (S_3)
1. Construction			
2. Segregation of Hazards			
3. Vertical Openings	÷ 2 =		
4. Sprinklers		÷ 2 =	
5. Fire Alarm	÷ 2 =		
6. Smoke Detection	÷ 2 =		
7. Interior Finish	÷ 2 =		
8. Smoke Control		÷ 2 =	
9. Exit Access			
10. Exit Systems			
11. Corridor/Room Separation	÷ 2 =	÷ 2 =	
12. Occupant Emergency Program			
Total	S_1 =	S_2 =	S_3 =

WORKSHEET 8.6.4 MANDATORY SAFETY REQUIREMENTS

Stories in Height	Control Requirement (S_a)		Egress Requirement (S_b)		General Fire Safety Requirement (S_c)	
	New	Existing	New	Existing	New	Existing
1–2 Stories	0.5	–1.0	1.5	0	2	–1
3 Stories	2.0	0	2.5	0	4	0
>3 Stories and ≤75 ft	4.5	2.0	3.5	0	7	2
>75 ft but <150 ft	10.5	7.5	9.5	5	12	6
≥150 ft	13.5	10.5	9.5	5	15	9

(For use with NFPA 101A-2013/NFPA *101*-20012) (p. 3 of 4)

FIGURE 8.6 ***Continued***

WORKSHEET 8.6.5 EQUIVALENCY EVALUATION

						Yes	No
Control Provided (S_1)	minus	Required Control (S_a)	≥	0	S_1 ☐ – S_a ☐ = ☐		
Egress Provided (S_2)	minus	Required Egress (S_b)	≥	0	S_2 ☐ – S_b ☐ = ☐		
General Fire Safety (S_3)	minus	Required Gen. Fire Safety (S_c)	≥	0	S_3 ☐ – S_c ☐ = ☐		

WORKSHEET 8.6.6 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

	Considerations	Met	Not Met	Not Applic.
A.	Building utilities conform to the requirements of Section 9.1.			☒
B.	The air conditioning, heating, and ventilating systems conform to Section 9.2, except for enclosure of vertical openings, which have been considered in Safety Parameter 3 of Worksheet 8.6.2.			☒
C.	Elevator installations are made in accordance with the requirements of Section 9.4.			
D.	Rubbish chutes, incinerators, and laundry chutes are installed in accordance with Section 9.5.			
E.	Portable fire extinguishers are installed and maintained in accordance with the requirements of 38.3.5/39.3.5 and 9.7.4.1.			☒
F.	Standpipes are provided in all new high-rise buildings as required by 38.4.2.			

All references are to NFPA *101*, *Life Safety Code.*

WORKSHEET 8.6.7 CONCLUSIONS

1. ☐ All of the checks in Worksheet 8.6.5 are in the "Yes" column and all applicable considerations in Worksheet 8.6.6 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for business occupancies.
2. ☐ All of the checks in Worksheet 8.6.5 are in the "Yes" column and all considerations identified in Worksheet 8.6.6 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for business occupancies.
3. ☐ One or more of the checks in Worksheet 8.6.5 are in the "No" column or any consideration identified in Worksheet 8.6.6 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for business occupancies.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

FIGURE 8.6 ***Continued***

▲ Chapter 9 Fire Safety Evaluation System for Educational Occupancies

9.1 Introduction.

▲ **9.1.1** This chapter is part of an NFPA guide and, therefore, is not mandatory. The term *shall* in this chapter is used to indicate that if the provisions of the chapter are applied, the procedures mandated are to be followed to ensure the effectiveness of the evaluation system.

▲ **9.1.2** The Fire Safety Evaluation System (FSES) is a measuring system. It compares the level of safety provided by an arrangement of safeguards that differ from those specified in NFPA *101*, *Life Safety Code*, to the level of safety provided in a building that conforms exactly with the details of the *Code*.

9.1.3 This Fire Safety Evaluation System is designed and intended to be used for evaluating educational occupancies (as defined in NFPA *101* as applying through the 12th grade). It is not designed or intended to be used for evaluating day care occupancies, assembly occupancies, or other non-educational occupancy uses of educational facilities. Neither is it designed or intended to be used for evaluating educational occupancies located in high-rise buildings.

9.2 Procedure for Determining Equivalency.

▲ **9.2.1** Evaluate the factors affecting either every fire zone or the building as a whole using Figure 9.6, Worksheets for Evaluating Fire Safety in Educational Occupancies.

9.2.1.1 Zoning must divide the building into units that consist of one or more complete fire/smoke zones. A fire/smoke zone is a portion of a building that is separated from all other portions of the building by building construction having at least a 1-hour fire resistance rating or smoke barriers having a 30-minute fire resistance rating and conforming to the requirements of Section 8.5 (NFPA *101*), or a combination of both. Any vertical openings (shafts, stairs) involved also must provide 1-hour separation. In facilities completely protected by automatic sprinkler protection, these fire resistance requirements do not apply. The elements separating one zone from another, however, must be of sound, smoke-resisting construction. Doors in zone separations must be either self-closing or equipped with automatic closers operated by smoke detectors.

9.2.1.2 Zones shall be permitted to be either adjacent to each other (for example, separate wings or building sections) or above each other (for example, floors or groups of floors).

9.2.1.3 Each zone containing spaces used for an educational occupancy can be evaluated using this system.

9.2.1.4 Each of the 14 safety parameters is to be analyzed, and the safety value for each parameter that best describes the condition in the building is to be identified. Only one value for each of the parameters is to be chosen. If two or more values appear to apply, the one with the lowest point value governs.

9.2.2 Using Worksheet 9.6.6, Facility Fire Safety Requirements, determine the acceptability of the general building systems (i.e., utilities, HVAC, elevator installations, and rubbish chutes, incinerators, and laundry chute installations).

9.2.3 Equivalency is achieved if the building or fire/smoke zone evaluations show equivalency or better in each and every zone and the requirements of Worksheet 9.6.6, Facility Fire Safety Requirements, are met. See Steps 1 through 6 in Section 9.6.

9.3 Glossary for Fire Safety Evaluation Worksheet for Educational Occupancies.

9.3.1 Introduction. This glossary is provided to assist in completing the Worksheet for Evaluating Fire Safety in Educational Occupancies. This glossary provides expanded discussion and definitions for the various items in the worksheets to assist the user where questions of definition or interpretation arise. To the maximum extent possible, the glossary does not repeat the definitions already existing in NFPA *101*, *Life Safety Code*, but rather references the appropriate paragraphs in NFPA *101*.

9.3.2 Areas of Application.

▲ **9.3.2.1** The entire building can be evaluated on a single set of worksheets. The building might, however, be zoned by considering each zone separately or by using any convenient grouping of zones.

9.3.2.1.1 Charges for Safety Parameter 2, "Segregation of Hazards," in Worksheet 9.6.2, Safety Parameters, apply to any hazardous area as described in 9.5.2 in the zone being evaluated and to any hazardous area in zones adjacent to or below the zone being evaluated.

9.3.2.1.2 Where zones are located above each other, the value assigned to Parameter 1, "Construction," in Worksheet 9.6.2, Safety Parameters, in each zone is based on the highest story used for regular human occupancy in that "stack of zones" and the type of construction for that stack of zones.

9.3.2.1.3 The assignment of values for Safety Parameter 5, "Detection, Alarm, and Communication"; Parameter 10, "Exit Access Corridors"; and Parameter 11, "Egress Routes," in Worksheet 9.6.2, Safety Parameters, does not consider conditions in unoccupied spaces in other zones where such are not involved in any egress paths.

9.3.2.1.4 The evaluation of Safety Parameter 11, "Egress Routes," in Worksheet 9.6.2, Safety Parameters, includes those portions of any egress route that serve the zone being evaluated. Any exposures or deficiencies pertaining to any part of the egress route must be taken into account in the evaluation of the zone.

9.3.2.2 Zones that do not involve regular human occupancy are evaluated the same as those with regular human occupancy, with the following variations:

(1) Any such zone shall be permitted to be omitted from the numerical evaluation if both of the following conditions are met:
   (a) The zone is not involved in the egress route from any space with regular human occupancy.
   (b) The zone conforms to NFPA *101*, *Life Safety Code*, requirements applicable to its use.
(2) Alternatively, such zones shall be permitted to be evaluated using this system, provided any additional egress capabilities and arrangements appropriate to the specific use of the space are provided.

▲ **9.4 Maintenance.** All protection systems, requirements, arrangements, and procedures shall be maintained in a dependable operating condition and a sufficient state of readiness and shall be used in such a manner that the intended safety function or hazard constraint is not impaired. Otherwise, they shall receive no credit in the evaluation.

9.5 Safety Parameters (Worksheet 9.6.2). The safety parameters are a measure of those building factors that bear upon or contribute to the safety of those persons who might be in the building at the time of a fire. The safety parameters in Worksheet 9.6.2 are described in 9.5.1 through 9.5.14.

▲ **9.5.1 Construction.** Construction types are classified in accordance with the definitions of NFPA 220, *Standard on Types of Building Construction*. Where the facility includes additions or connected structures of different construction, the rating and classification of the structure is based on one of the following:

(1) Separate buildings where the separation between the portions of the building is a fire barrier having at least a

2-hour fire resistance rating and any opening protectives have at least a 1½-hour fire protection rating
(2) The lower safety parameter point score involved where such a separation does not exist

▲ **9.5.2 Segregation of Hazards.** The assignment of charges for unsegregated hazardous contents areas is a four-step process.

▲ **9.5.2.1 Step 1 — Identify Hazardous Contents Areas.** A hazardous area is any space or compartment in which a hazardous activity or storage of flammable or readily combustible products exists that possesses the potential for producing a fully involved fire. Examples of these types of areas in typical educational occupancies include the following:

(1) Laundries
(2) Chemistry storage rooms
(3) Maintenance (such as woodworking and painting areas)
(4) Janitor closets
(5) Boiler rooms and furnace rooms
(6) Rooms used for the storage or processing of combustible supplies
(7) Rooms used for the storage or processing of hazardous materials, flammable liquids, or combustible liquids

▲ **9.5.2.2 Step 2 — Determine the Level of Hazard.** There are two levels of hazard: structurally endangering and not structurally endangering.

9.5.2.2.1 Structurally Endangering. A hazardous area with a potential fire severity that might exceed the tested resistance of the enclosure and defeat the basic structural integrity of the building framing as defined in Safety Parameter 1, "Construction," of Worksheet 9.6.2. In educational occupancies, shops and industrial technology areas involving the use of open flames, welding operations, and limited quantities of flammable liquids should be considered structurally endangering. Other areas not having these types of uses should be considered not structurally endangering.

9.5.2.2.2 Not Structurally Endangering. A hazardous area with sufficient fire potential to build to full involvement (flashover) and present a danger of propagating through openings or wall partitions but not possessing sufficient total potential to endanger the structural framing or floor decking as defined in Safety Parameter 1 of Worksheet 9.6.2.

▲ **9.5.2.3 Step 3 — Determine the Fire Protection Provided.**

9.5.2.3.1 The parameter value for hazardous areas is based on the presence or absence of the fire protection necessary to control or confine the hazard. Two different types of fire protection are considered. The first consists of automatic sprinklers or other appropriate extinguishing systems covering the entire hazard. The credit for sprinklers shall not be given unless the hazardous area is separated from the rest of human occupancy or the egress route by reasonably smoke-resistant partitions and doors (other than sprinklered janitor closets with louvered doors in accordance with 14.3.2.1 or 15.3.2.1 of NFPA *101*). The second is a complete fire enclosure having a sufficient fire resistance rating to contain the potential fire severity of the hazardous area. This includes the following:

(1) The separation of the hazardous area from any structural framing members
(2) Partitions separating the hazardous area from all other spaces
(3) Fire protection–rated doors sufficient to exceed the potential of the fire load involved

9.5.2.3.2 Any hazardous space that has any of these protection systems is classified as having single protection.

▲ **9.5.2.4 Step 4 — Determine Degree of Deficiency and Assign Parameter Values.**

9.5.2.4.1 The parameter value ultimately is determined by the degree of the deficiency of the hazardous contents area based on the level of protection needed. Table 9.5.2.4.1 provides a matrix to be used to determine the degree of deficiency to be assessed.

9.5.2.4.2 In some situations, more than one hazardous area with the same or differing levels of deficiency exists. The overall charge is based on the single most serious deficiency for the hazardous area.

▲ **9.5.3 Vertical Openings.** These values apply to vertical openings and penetrations including exit stairways, ramps, and any other vertical exits, pipe shafts, ventilation shafts, duct penetrations, and laundry and incinerator chutes. The charge for vertical openings is based on the fire resistance of the enclosure, if provided.

9.5.3.1 A vertical opening or penetration is classified as open if it has any of the following characteristics:

(1) Unenclosed
(2) Unenclosed but is the only vertical opening and is in accordance with the convenience opening provisions of 8.6.9.1 of NFPA *101*, in which case the parameter value of 9.5.3.1(2) is to be assigned
(3) Enclosed but has doorways (or similar portals) that are without doors
(4) Enclosed but has unprotected openings other than doorways
(5) Enclosed with cloth, paper, or similar materials without any sustained fire-stopping capabilities

9.5.3.2 The credit for vertical opening protection varies depending on the number of stories connected by the vertical opening and the degree of enclosure.

▲ **9.5.4 Sprinklers.**

9.5.4.1 Where an automatic sprinkler is installed for either total or partial building coverage, the system shall be in accordance with Section 9.7 (NFPA *101*) for the sprinklered areas.

Table 9.5.2.4.1 Segregation of Hazards — Degree of Deficiency

	No protection	Sprinkler protection	Fire resistance–rated enclosure*	Sprinklered and fire resistance–rated enclosure*
Not structurally endangering	Single deficiency	No deficiency		
Structurally endangering	Double deficiency	Single deficiency	Single deficiency	No deficiency

*Complete enclosure having sufficient fire resistance to contain the potential of the hazardous contents area.

9.5.4.2 To receive credit for protection, the sprinkler system must be equipped with an automatic alarm-initiating device that activates the building's fire alarm system or otherwise sounds an alarm sufficiently audible to be heard in all occupied areas.

9.5.4.3 To receive credit for "complete building" sprinkler protection, the entire building must be provided with sprinkler coverage and must cover all zones of the building.

9.5.4.4 To receive credit for "partial – occupied areas" sprinkler protection, sprinklers must be provided throughout all areas subject to occupancy and all hazardous contents areas.

▲ **9.5.5 Detection, Alarm, and Communication.** Fire alarm systems are defined in 9.5.5.1 through 9.5.5.4.

9.5.5.1 None. There is no fire alarm system, or the system is incomplete and does not meet the requirements for a higher-scored category.

9.5.5.2 Manual System Only. There is a manual fire alarm system that provides automatic occupant notification and meets the requirements of Section 9.6 (NFPA *101*). An alternative protection system in accordance with 14.3.4.2.3 or 15.3.4.2.3 (NFPA *101*) is to be considered an alarm system with manual initiation.

9.5.5.3 Manual with Fire Detection in Hazardous Areas. There is a manual fire alarm system that provides automatic occupant notification, where additional initiation occurs via automatic fire detection in hazardous areas such as boiler rooms, shops, laboratories, kitchens, laundry rooms, and storage rooms, and such system meets the requirements of Section 9.6 (NFPA *101*).

9.5.5.4 Manual with Smoke Detection. There is a manual fire alarm system that provides automatic occupant notification, where additional initiation occurs via automatic smoke detection throughout the building, and such system meets the requirements of Section 9.6 (NFPA *101*).

▲ **9.5.6 Emergency Forces Notification.** Emergency forces notification means are defined in 9.5.6.1 through 9.5.6.3.

9.5.6.1 None. There is no emergency forces notification, or the system is incomplete and does not meet the requirements for a higher-scored category.

9.5.6.2 Administrative. Administrative emergency forces notification is a system in accordance with 15.3.4.3.2.1 (NFPA *101*).

9.5.6.3 Automatic. Automatic emergency forces notification is a system in accordance with 9.6.4 (NFPA *101*).

▲ **9.5.7 Interior Finish in Exits.**

9.5.7.1 Classification of interior finish is based on the flame-spread rating of the interior finish tested in accordance with ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*. The requirements apply to wall and ceiling finish materials as described in Section 10.2 (NFPA *101*).

9.5.7.2 No consideration is included in the safety parameter value for any finish with a flame-spread rating of more than 200 or for any finish not rationally measured by ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*. Thus, this FSES should not be used where such conditions exist. Such materials include foamed plastics; asphalt-impregnated paper; materials that melt, drip, or delaminate; or those capable of inducing extreme rates of fire growth and rapid flashover. In any case where these materials are involved, the resultant risk is considered beyond the capacity of this evaluation system and requires individual appraisal.

9.5.7.3 Interior wall and ceiling finish materials tested in accordance with NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, or NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, as permitted by Section 10.2 (NFPA *101*), and meeting the criteria established in Section 10.2 (NFPA *101*) for those test standards, shall be scored as Class A interior finish materials (flame spread ≤25).

9.5.7.4 Any interior finish having a flame spread of 75 or less that is protected by automatic sprinklers is evaluated as having a flame spread not exceeding 25. Any interior finish having a flame spread of more than 75 but not more than 200 that is protected by automatic sprinklers is evaluated as having a flame spread not exceeding 75.

▲ **9.5.8 Interior Finish in Corridors and Lobbies.** See 9.5.7.

▲ **9.5.9 Interior Finish in Rooms.** See 9.5.7.

▲ **9.5.10 Exit Access Corridor.**

9.5.10.1 The charge for dead-end access is made where any corridor affords access in only one direction to a required exit.

9.5.10.2 If a dead-end corridor distance exceeds 75 ft (23 m), a separate analysis must be made to evaluate the potential of flashover of any spaces that could block egress from the dead-end corridor and to determine the potential rate of smoke-filling of the egress system involved. If the safe time is shorter than the expected egress time, the evaluation should be discontinued unless a corrective action is specified.

9.5.10.3 Any system with common path of travel in excess of that permitted by NFPA *101* should be considered deficient under Safety Parameter 11, "Egress Routes."

▲ **9.5.11 Egress Routes.**

9.5.11.1 Egress routes are the paths of travel from any point within a room to the public way using any types and arrangements described in Chapters 14 and 15 (NFPA *101*).

9.5.11.2 Egress routes are defined in 9.5.11.2.1 through 9.5.11.2.5.

9.5.11.2.1 Single Egress Route. A single route exists where occupants on any floor do not have either a direct exit to a public way or multiple egress routes as defined in 9.5.11.2.2.

9.5.11.2.2 Multiple Egress Routes. Multiple routes exist where the occupants on a floor have a choice of two separate means of egress routes to a public way using the permitted types in Chapters 14 and 15 (NFPA *101*).

9.5.11.2.3 Deficient — Multiple Egress Routes. An egress route is deficient if it fails to meet any of applicable criteria of NFPA *101*, *Life Safety Code*, including capacity. Any system with common path of travel in excess of that permitted by Chapters 14 and 15 (NFPA *101*) should be considered deficient under Parameter 11, "Egress Routes." An egress route is deficient if a room or space larger than 1000 ft^2 (92.9 m^2) or with an occupant load of more than 50 persons does not have a minimum of two exit access doors providing access to separate exits.

9.5.11.2.4 Smokeproof Enclosure. Credit for a smokeproof enclosure shall be permitted to be given for a stairway designed and tested in accordance with the requirements of 7.2.3 (NFPA *101*) for a smokeproof enclosure. To receive credit for a smokeproof enclosure, all exit stairs credited in Safety Parameter 10, "Exit Access Corridor," and Safety Parameter 11, "Egress Routes," shall meet the smokeproof enclosure requirements.

9.5.11.2.5 Direct Exit. To be credited for direct exits, each room shall have within that unit a door that opens to the exterior at grade level or onto an exterior balcony with direct access to an exterior exit. Where such openings are directly onto grade in a location where any person egressing can move directly away from the building without further exposure, the credit for direct exit shall be given even if there are no other egress routes from the space.

▲ **9.5.12 Corridor/Room Separation.** The values assigned in Safety Parameter 12, "Corridor/Room Separation," are based on the quality of separation between the room and the corridor. For purposes of this evaluation, corridor separation in educational occupancy buildings is considered as complete if it meets the requirements of 14.3.6 or 15.3.6 (NFPA *101*). For areas within educational occupancies that use an "open-plan" concept where all of the classrooms egress through an intervening space (such as a media or activity center), a separate evaluation is recommended that calculates fuel loading and available safe egress time.

9.5.12.1 Corridor/room separation is defined in 9.5.12.1.1 through 9.5.12.1.4.

9.5.12.1.1 No Separation Exists or Multiple Penetrations. The separation is judged to be nonexistent if there is no corridor leading to an exit, there are no barriers against smoke or fire spread, there are no doors between corridors and adjacent rooms, or there are multiple penetrations. Examples of penetrations include transfer grilles for air movement, transoms, and non-fire-rated glass.

9.5.12.1.2 Incomplete. The separation is judged as "incomplete" if the wall to the corridor has some unprotected openings (for example, louvers, gaps, or transfer grilles) between the floor and ceiling but these openings are minor in relation to the area of the room or are located low in walls or doors. If openings exist above the ceiling level, the separation is considered complete if the ceiling in the room is a completed membrane. In this case, the separation rating is based on the level of resistance involved in the wall/ceiling system.

9.5.12.1.3 Solid Core Doors. This parameter should be used if the corridor/room doors are solid core wood or metal doors at least 1¾ in. (44 mm) thick.

9.5.12.1.4 Doors with ≥20 Minute Fire Protection Rating. Use this parameter if doors and frames are fire protection–rated for 20 minutes or greater protection and are self-closing or automatic-closing.

▲ **9.5.13 Smoke Control.**

9.5.13.1 The active smoke control value should be used when an engineered smoke control system complying with NFPA 92, *Standard for Smoke Control Systems*, is installed and the building is protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 9.7 (NFPA *101*).

9.5.13.2 The passive smoke control with auto-closing doors value should be used when the building is subdivided into compartments by smoke partitions having a 1-hour fire resistance rating complying with Section 8.4 (NFPA *101*), and all doors located within the smoke partition are designed to close automatically upon the activation of the fire alarm system or the fire sprinkler system per *NFPA 72, National Fire Alarm and Signaling Code*.

9.5.13.3 The passive smoke control value should be used when the building is subdivided into compartments by smoke partitions having a 1-hour fire resistance rating complying with Section 8.4 (NFPA *101*), but not meeting the provisions of 9.5.13.2.

▲ **9.5.14 Occupant Emergency Program.**

9.5.14.1 The value of this parameter is determined by the number of emergency egress and relocation drills conducted in the building each year.

9.5.14.2 To receive a parameter value other than –6, the building or zone occupants are required to take part in scenario-oriented emergency egress and relocation drills conducted in accordance with the appropriate provisions of NFPA *101*, *Life Safety Code*. The scenarios should be based on the hazardous conditions that could develop during a fire in the facility. The scenarios should also include planning and provisions for the evacuation or relocation of occupants with disabilities.

▲ **9.6 Worksheets for Evaluating Fire Safety in Educational Occupancies.** The worksheets for evaluating fire safety in educational occupancies use a six-step process found in Figure 9.6.

▲ **9.6.1 Step 1 — Complete the Cover Sheet Using Worksheet 9.6.1.** See Figure 9.6.

▲ **9.6.2 Step 2 — Determine Individual Safety Evaluations Using Worksheet 9.6.2.** The following steps should be taken:

(1) Select and circle the safety value for each parameter in Worksheet 9.6.2, Safety Parameters, that best describes the conditions in the facility. Only one value for each of the parameters is to be chosen. If two or more values appear to apply, the one with the lowest point value governs.
(2) Transfer each of the 14 circled safety parameter values from Worksheet 9.6.2 to the available blocks corresponding to each safety parameter in Worksheet 9.6.3, Individual Safety Evaluation. Where the blocks indicate "÷2," enter one-half the value from Worksheet 9.6.2.
(3) Add each of the three columns, keeping in mind that any negative numbers need to be deducted.
(4) Transfer the resulting values for S_1, S_2, and S_3 to Worksheet 9.6.5, Equivalency Evaluation.

▲ **9.6.3 Step 3 — Determine Mandatory Requirements Using Worksheet 9.6.4A or 9.6.4B.** The following steps should be taken:

(1) Circle the mandatory values in Worksheet 9.6.4A or 9.6.4B, Mandatory Safety Requirements, as appropriate for the building being evaluated.
(2) Transfer the circled values from Worksheet 9.6.4A or 9.6.4B to the boxes marked S_a, S_b, and S_c in Worksheet 9.6.5, Equivalency Evaluation.

▲ **9.6.4 Step 4 — Evaluate Fire Safety Equivalency Using Worksheet 9.6.5.** The following steps should be taken:

(1) Perform the subtractions indicated in Worksheet 9.6.5. Enter the differences in the appropriate boxes.
(2) For each row, check "yes" if the value in the answer box is zero (0) or greater. Check "no" if the value in the answer box is negative.

▲ **9.6.5 Step 5 — Evaluate Other Considerations Not Previously Addressed, Using Worksheet 9.6.6.** The equivalency covered by Worksheets 9.6.2 through 9.6.5 includes the majority of considerations covered by the *Life Safety Code*. Some considerations are not evaluated by this method and must be considered separately. These additional considerations are covered in Worksheet 9.6.6, Facility Fire Safety Requirements. Complete one copy of this separate worksheet for each facility.

▲ **9.6.6 Step 6 — Determine Equivalency Conclusion.** Conclude whether the level of life safety is at least equivalent to that prescribed by the *Life Safety Code*, using Worksheet 9.6.7, Conclusions. Worksheet 9.6.7 combines the zone fire safety equivalency evaluation of Worksheet 9.6.5 and the additional considerations of Worksheet 9.6.6.

WORKSHEET 9.6.1 COVER SHEET

Fire Safety Evaluation Worksheet for Educational Occupancies

Facility Identification _____

Evaluator _____ Date _____

Notes:

▲ WORKSHEET 9.6.2 SAFETY PARAMETERS

Safety Parameters	Parameter Values							
1. Construction	Combustible					Noncombustible		
NFPA 220 Building Construction Types/ Stories in Height	Type V (000)	Type V (111)	Type IV (2HH)	Type III (200)	Type III (211)	Type II (000)	Type II (111)	Type I(442), Type I(332), Type II(222)
1 Story	1	2	2	1	2	1	2	2
2 Stories	0	1	1	0	1	0	1	2
3 Stories	–4	0	0	–4	0	–4	0	2
≥4 Stories but not High Rise	–8	–1	–1	–8	–1	–8	–1	2

2. Segregation of Hazards	Exposed to Exit System		Segregated from Exit Routes		None or No Deficiencies
	Double Def.	Single Def.	Double Def.	Single Def.	
	–7	–4	–4	0	0

3. Vertical Openings	Open (or incomplete enclosure)			No Opening	Enclosed		
	Connects 4 or More Stories	Connects 3 Stories	Connects 2 Stories	Single Story Building W/O Basement	Smoke Resistant or <30 min	≥30 min to <1 hr	≥1 hr
	–10	–6	–2(2)[a]	2(1)[b]	1	1	2(1)[c,d]

4. Sprinklers[e]		Partial		Complete Building	
	None	Hazardous Contents Areas Only	Occupied Areas but not Throughout Unoccupied Areas	Standard Response Sprinklers	Quick Response Sprinklers
	0(–2)[f,g]	1(–1)[f,g]	6(0)[g]	10	12

5. Detection, Alarm, and Communication[h]				
	None	Alarm System with Manual Initiation and Automatic Occupant Notification	Alarm System with Manual Initiation, Fire Detection in Hazardous Contents Areas, and Automatic Occupant Notification	Alarm System with Manual Initiation, Complete Smoke Detection, and Automatic Occupant Notification
	–6	0	2	6

(Worksheet 9.6.2 continues.)

FIGURE 9.6 Worksheets for Evaluating Fire Safety in Educational Occupancies.

Worksheet 9.6.2 *Continued*

6. Emergency Forces Notification	None	Administrative			Automatic	
	–1	0(–1)[i]			1(–1)[i]	
7. Interior Finish in Exits (Flame Spread Ratings)	>75 to ≤200		>25 to ≤75		≤25	
	–2		–1		0	
8. Interior Finish in Corridors and Lobbies (Flame Spread Ratings)	>75 to ≤200		>25 to ≤75		≤25	
	–3		–2		0	
9. Interior Finish in Rooms (Flame Spread Ratings)	>75 to ≤200		>25 to ≤75		≤25	
	–2		–1		0	
10. Exit Access Corridors	Max. Dead End Length		No Dead Ends >20 ft (>50 ft if Parameter 4 is ≥10) and Travel Is			
	>50 ft to ≤75 ft	>20 ft to ≤50 ft and Parameter 4 is <10	>200 ft	>150 ft to ≤200 ft	>50 ft to ≤150 ft	≤50 ft
	–2	–1	–2	–1	0	2
11. Egress Routes	Single Route	Multiple Routes			Direct Exit	
		Deficient	Not Deficient	Smokeproof Enclosures		
	NV(–6)[j]	–2	0	1	5	
12. Corridor/Room Separation	No Separation Exists or Multiple Penetrations	Separation Exists and Level of Protection is				
		Incomplete	Smoke Partitions		Fire-Rated Walls (≥½ hr Existing, ≥1 hr New)		
			Smoke-Resistant Door W/O Closer	Smoke-Resistant Door W/Closer	Smoke-Resistant Door W/Closer	Solid-Core Doors (no nonrated glazing) W/Closer	Doors W/≥20-min FPR
	–3	–2	–1(0)[l]	0(0)[m]	0(0)[m]	1	2
13. Smoke Control	None	Passive	Passive with Auto Closing Doors	Active		
	–2	0(0)[k]	1	2		
14. Occupant Emergency Program	Number of Emergency Egress and Relocation Drills Conducted					
	None	≥2 during first 2 months, plus ≥2 others spread out during remainder of school year		≥2 during first month, plus ≥1 per month during remainder of school year		
	–6	–3		0		

NV – Where a single egress route exists for other than a 1-story building, this FSES does not evaluate overall safety. Other analysis techniques might be applied in accordance with the equivalency concept of Section 1.4 of NFPA *101, Life Safety Code*.

[a] Use (2) if only vertical opening is in accordance with 8.6.9.1 (NFPA *101*).

[b] Use (1) if educational occupancy is existing.

[c] Use (1) if vertical opening enclosure is existing.

[d] Use (1) if building construction is Type II(000), Type III(200) or Type V(000).

[e] For sprinkler parameter values >0, sprinkler system must be electrically supervised.

[f] Use ( ) in existing educational occupancy if student occupied level below LED is not sprinklered.

[g] Use ( ) in new educational occupancy if level below LED is not sprinklered.

[h] If alternative protection system is provided in accordance with 14.3.4.2.3 or 15.3.4.2.3 (NFPA *101*), see 9.5.5.2.

[i] Use (-1) if Parameter 5 value is -6.

[j] Use (-6) for 1-story buildings only; for other than 1-story buildings the NV note applies.

[k] Use (0) if no smoke control but aggregate floor area having a common atmosphere <30,000 ft^2 and building <300 ft length and <300 ft width.

[l] Use (0) if room is normally occupied classroom and Parameter 4 is ≥10.

[m] Use (0) where door is without closer if room is normally occupied classroom and Parameter 4 is ≥10.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 2 of 4)

FIGURE 9.6 *Continued*

WORKSHEET 9.6.3 INDIVIDUAL SAFETY EVALUATION

Safety Parameters	Fire Control (S_1)	Egress Provided (S_2)	General Fire Safety Provided (S_3)
1. Construction			
2. Segregation of Hazards			
3. Vertical Openings			
4. Sprinklers		÷ 2 =	
5. Detection, Alarm, and Communication	÷ 2 =		
6. Emergency Forces Notification			
7. Interior Finish in Exits	÷ 2 =		
8. Interior Finish in Corridors and Lobbies	÷ 2 =		
9. Interior Finish in Rooms	÷ 2 =		
10. Exit Access Corridor			
11. Egress Routes			
12. Corridor/Room Separation	÷ 2 =	÷ 2 =	
13. Smoke Control			
14. Occupant Emergency Program			
Total	S_1 =	S_2 =	S_3 =

WORKSHEET 9.6.4A MANDATORY SAFETY REQUIREMENTS — NEW BUILDINGS ≤20,000 ft² OR EXISTING BUILDINGS

	Control Requirement (S_a)		Egress Requirement (S_b)		General Fire Safety Requirement (S_c)	
Stories in Height	New	Existing	New	Existing	New	Existing
1 Story	2.5	0.5	2	1.5	2	–1
2 Stories	3.5	0.5	3	1.5	3	–1
3 Stories	2.5	–0.5	3	1.5	2	–2
≥4 Stories but not High Rise[a]	11.5	1.5	6	1.5	7	0

[a] See 9.1.3.

WORKSHEET 9.6.4B MANDATORY SAFETY REQUIREMENTS — NEW BUILDINGS >20,000 ft²

Stories in Height	Control Requirement (S_a)	Egress Requirement (S_b)	General Fire Safety Requirement (S_c)
1 Story	9.5	5	5
2 Stories	10.5	6	6
3 Stories	9.5	6	5
≥4 Stories but not High Rise[a]	11.5	6	7

[a] See 9.1.3.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

FIGURE 9.6 ***Continued***

WORKSHEET 9.6.5 EQUIVALENCY EVALUATION

						Yes	No
Fire Control Provided (S_1)	minus	Required Control (S_a)	≥	0	S_1 ☐ – S_a ☐		
Egress Provided (S_2)	minus	Required Egress (S_b)	≥	0	S_2 ☐ – S_b ☐		
Gen. Fire Safety Provided (S_3)	minus	Required Gen. Fire Safety (S_c)	≥	0	S_3 ☐ – S_c ☐		

WORKSHEET 9.6.6 FACILITY FIRE SAFETY REQUIREMENTS

	Considerations	Met	Not Met	Not Applic.
A.	Building utilities conform to the requirements of Section 9.1 (NFPA *101*).			X
B.	The air conditioning, heating, and ventilating systems conform to Section 9.2 (NFPA *101*), except for enclosure of vertical openings, which have been considered in Safety Parameter 3 of Table 9.6.2.			X
C.	Elevator installations are made in accordance with the requirements of Section 9.4 (NFPA *101*).			
D.	Rubbish chutes, incinerators, and laundry chutes are installed in accordance with Section 9.5 (NFPA *101*).			
E.	Emergency lighting is provided in accordance with the requirements of 14.2.9 and 15.2.9 (NFPA *101*).			
F.	Exit signs are provided in accordance with the requirements of 14.2.10 and 15.2.10 (NFPA *101*).			
G.	Kindergarten, first and second grade student occupancy within the building conforms to the requirements of 14.2.1.2 through 14.2.1.4 and 15.2.1.2 through 15.2.1.4 (NFPA *101*).			X
H.	Artwork on walls and ceilings conforms to the requirements of 14.7.4.3 and 15.7.4.3 (NFPA *101*).			X

WORKSHEET 9.6.7 CONCLUSIONS

1. ☐ All of the checks in Worksheet 9.6.5 are in the "Yes" column and all applicable considerations in Worksheet 9.6.6 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for educational occupancies.

2. ☐ All of the checks in Worksheet 9.6.5 are in the "Yes" column and all considerations identified in Worksheet 9.6.6 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for educational occupancies.

3. ☐ One or more of the checks in Worksheet 9.6.5 are in the "No" column or any consideration identified in Worksheet 9.6.6 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for educational occupancies.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

FIGURE 9.6 ***Continued***

Annex A Explanatory Material

Annex A is not a part of the recommendations of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.3.1 The mandatory values presented in worksheets in the various FSES chapters are calibrated to measure safety against the provisions of the most current edition of NFPA *101*, *Life Safety Code*, which, in the case of this 2013 edition of NFPA 101A, is the 2012 edition. The spreadsheets used to calculate the mandatory values serve as a record of the safety parameters and associated point values determined by the technical committee as the baseline required by the *Code*. The spreadsheets are maintained in the permanent committee files at NFPA headquarters, serve as the historical record, and are consulted when each new edition of NFPA *101* is published to determine what mandatory values need further calibration.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.5 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

Annex B Informational References

B.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this guide and are not advisory in nature unless also listed in Chapter 2 for other reasons.

B.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA *101*®, *Life Safety Code*®, 2012 edition.

B.1.2 Other Publications. (Reserved)

B.2 Informational References. The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

National Technical Information Service (NTIS), Sales and Order Desk, 5285 Port Royal Road, Springfield, VA 22161; telephone: (800) 553-6847; (703) 605-6900; E-mail orders: orders@ntis.gov; Internet: http://www.ntis.gov/ordering.htm.

Nelson, H. E., *Fire Safety Evaluation System for NASA Office/Laboratory Buildings*, NBSIR 86-3404, National Bureau of Standards, Gaithersburg, MD, November 1986. NTIS PB87-134300.

Nelson, H. E., and A. J. Shibe, *System for Fire Safety Evaluation of Health Care Facilities*, NBSIR 78-1555-1, National Bureau of Standards, Gaithersburg, MD, May 1980. [U.S./Japan Government Cooperative Program on Natural Resources (UJNR), Fire Research and Safety, Fourth Joint Panel Meeting of UJNR Panel, February 5–9, 1979, Tokyo, Japan.] NTIS PB80-195795.

Nelson, H. E., and A. J. Shibe, *System for Fire Safety Evaluation for Multifamily Housing*, Interim Report, NBSIR 82-2562, National Bureau of Standards, Gaithersburg, MD, September 1982. NTIS PB83-119909.

Nelson, H. E., and A. J. Shibe, *Development of a Fire Safety Evaluation System for Detention and Correctional Occupancies*, NBSIR 84-2976, National Bureau of Standards, Gaithersburg, MD, January 1985. NTIS PB85-177913.

Nelson, H. E., B. M. Levin, A. J. Shibe, N. E. Groner, R. L., Paulsen, D. M. Alvord, S. D. Thorne, *Fire Safety Evaluation Systems for Board and Care Homes*, Final Report, NBSIR 83-2659, National Bureau of Standards, Gaithersburg, MD, March 1983. NTIS PB83-192674.

Nelson, H. E., A. J. Shibe, B. M. Levin, S. D. Thorne, L. Y. Cooper, *Fire Safety Evaluation System for National Park Service Overnight Accommodations*, NBSIR 84-2896, National Bureau of Standards, Gaithersburg, MD, September 1984. NTIS PB85-105518.

B.3 References for Extracts in Informational Sections. (Reserved)

Index

Formal Interpretation

NFPA 101A

Alternative Approaches to Life Safety

2013 Edition

Reference: 4.6.10.3.2
F.I. No.: 101A-01-1

Question: Is it the intent to permit NFPA 101A, Chapter 4, Fire Safety Evaluation System for Health Care Occupancies to be used to evaluate the level of safety provided for a health care occupancy that does not conform with the provisions of NFPA *101*, Section 7.7, Discharge from Exits, such as that related to the exit discharge path to a public way?

Answer: Yes.

Issue Edition: 2001
Reference: 4.6.10.3.2
Issue Date: January 10, 2006
Effective Date: January 30, 2006

Sequence of Events Leading to Issuance of this NFPA Committee Document

Step 1: Call for Proposals

- Proposed new Document or new edition of an existing Document is entered into one of two yearly revision cycles, and a Call for Proposals is published.

Step 2: Report on Proposals (ROP)

- Committee meets to act on Proposals, to develop its own Proposals, and to prepare its Report.
- Committee votes by written ballot on Proposals. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.
- Report on Proposals (ROP) is published for public review and comment.

Step 3: Report on Comments (ROC)

- Committee meets to act on Public Comments to develop its own Comments, and to prepare its report.
- Committee votes by written ballot on Comments. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.
- Report on Comments (ROC) is published for public review.

Step 4: Technical Report Session

- "*Notices of intent to make a motion*" are filed, are reviewed, and valid motions are certified for presentation at the Technical Report Session. ("Consent Documents" that have no certified motions bypass the Technical Report Session and proceed to the Standards Council for issuance.)
- NFPA membership meets each June at the Annual Meeting Technical Report Session and acts on Technical Committee Reports (ROP and ROC) for Documents with "certified amending motions."
- Committee(s) vote on any amendments to Report approved at NFPA Annual Membership Meeting.

Step 5: Standards Council Issuance

- Notification of intent to file an appeal to the Standards Council on Association action must be filed within 20 days of the NFPA Annual Membership Meeting.
- Standards Council decides, based on all evidence, whether or not to issue Document or to take other action, including hearing any appeals.

Committee Membership Classifications

The following classifications apply to Technical Committee members and represent their principal interest in the activity of the committee.

M *Manufacturer:* A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.

U *User:* A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.

I/M *Installer/Maintainer:* A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.

L *Labor:* A labor representative or employee concerned with safety in the workplace.

R/T *Applied Research/Testing Laboratory:* A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards.

E *Enforcing Authority:* A representative of an agency or an organization that promulgates and/or enforces standards.

I *Insurance:* A representative of an insurance company, broker, agent, bureau, or inspection agency.

C *Consumer:* A person who is, or represents, the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in the *User* classification.

SE *Special Expert:* A person not representing any of the previous classifications, but who has a special expertise in the scope of the standard or portion thereof.

NOTES:
1. "Standard" connotes code, standard, recommended practice, or guide.
2. A representative includes an employee.
3. While these classifications will be used by the Standards Council to achieve a balance for Technical Committees, the Standards Council may determine that new classifications of members or unique interests need representation in order to foster the best possible committee deliberations on any project. In this connection, the Standards Council may make appointments as it deems appropriate in the public interest, such as the classification of "Utilities" in the National Electrical Code Committee.
4. Representatives of subsidiaries of any group are generally considered to have the same classification as the parent organization.

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Job Title *(check one)*

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- ❑ Fire Chief, Other Fire Service (A11)
- ❑ Loss Control, Risk Manager (L11)
- ❑ Inspector, Building Official, Fire Marshal (F03)
- ❑ Owner, President, Manager, Administrator (C10)
- ❑ Other (please specify): (G11)_____

Type of Organization *(check one)*

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Chapter 1

The NFPA *Manual of Style* dictates that Chapter 1 of each NFPA code, standard, guide, and recommended practice be titled Administration, and provide framework relative to scope, purpose, and application. NFPA 101A provides alternative methods to measuring life safety based on NFPA *101, Life Safety Code*. As such, NFPA 101A does not have its own scope and purpose statements. The usual items relegated to Chapter 1 of NFPA documents are adequately detailed in NFPA 101A in Section 1.3, Application.

Units of Measurement. NFPA *101* presents inch-pound values for measurements with SI values (metric units) given in parentheses, with each being acceptable for use as primary units for satisfying *Code* requirements. Similarly, NFPA 101A — in its text portion — presents inch-pound values for measurements with SI values given in parentheses. The inch-pound numerical measurements presented in NFPA 101A are typically limited to that of feet and square feet. Much of NFPA 101A consists of worksheets (e.g., see Worksheet 4.7.1 through Worksheet 4.7.11, comprising Figure 4.7, on pages 101A-13 through 101A-16). The worksheets are simplified to use only inch-pound units and avoid visual clutter. Those worksheets employing numerical measurements also present conversion factors for metric values. For example, Worksheet 4.7.6 includes the line that follows: For SI units, 1 ft = 0.3048 m; 1 ft^2 = 0.092 m^2.

1.3.1*

The "alternative approaches to life safety" addressed in NFPA 101A-2013 subsection 1.3.1 are six in number. Each appears in a separate chapter. Five of the alternative approaches consist of fire safety evaluation systems (FSESs). Each FSES applies to a specific occupancy — health care (Chapter 4), detention and correctional (Chapter 5), board and care (Chapter 7), business (Chapter 8), and educational (Chapter 9). Each FSES provides a formalized method or tool for measuring the level of life safety against that required by NFPA *101*-2012, *Life Safety Code*, for use in an equivalency submittal to the authority having jurisdiction (AHJ) as permitted by NFPA *101* as follows:

> **1.4* Equivalency.** Nothing in this *Code* is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this *Code*.
>
> **1.4.1 Technical Documentation.** Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.
>
> **1.4.2 Approval.** The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.
>
> **1.4.3* Equivalent Compliance.** Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this *Code*.

One additional, non-FSES, alternative approaches system is provided in Chapter 6. It provides a mathematical method for determining evacuation capability for existing board and care occupancies. See the annotated text associated with Chapter 6.

1.3.2

The 2013 edition of NFPA 101A is tied specifically to the 2012 edition of NFPA *101*, *Life Safety Code*. Each edition of NFPA 101A is published one year after the associated (i.e., tied-to) edition of NFPA *101*. The one-year delay permits changes to the requirements of NFPA *101* to be known so that the "mandatory values" in each NFPA 101A fire safety evaluation system (FSES) can reflect accurately what is required by NFPA *101*. For examples of mandatory values used in an NFPA 101A FSES, see Worksheet 4.7.8A, Worksheet 4.7.8B, and Worksheet 4.7.8C.

As a guide (see annotated text associated with 1.3.1), use of NFPA 101A can neither be mandated nor referenced in a mandatory fashion in NFPA *101*, which is a code. NFPA *101* Section 1.4 permits equivalency (again, see annotated text associated with 1.3.1), and the advisory annex text points the user to the tools in NFPA 101A. Examples of NFPA *101* advisory annex text addressing the use of NFPA 101A follow.

Equivalency for new health care occupancies

A.18.1.1.1.1 In determining equivalency for conversions, modernizations, renovations, or unusual design concepts of hospitals or nursing homes, the authority having jurisdiction is permitted to accept evaluations based on the health care occupancies fire safety evaluation system (FSES) of NFPA 101A, *Guide on Alternative Approaches to Life Safety,* utilizing the parameters for new construction.

Equivalency for existing health care occupancies

A.19.1.1.1.1 In determining equivalency for existing hospitals or nursing homes, the authority having jurisdiction is permitted to accept evaluations based on the health care occupancies fire safety evaluation system (FSES) of NFPA 101A, *Guide on Alternative Approaches to Life Safety,* utilizing the parameters for existing buildings.

Evacuation capability for existing board and care occupancies

A.3.3.76 Evacuation Capability. The evacuation capability of the residents and staff is a function of both the ability of the residents to evacuate and the assistance provided by the staff. It is intended that the evacuation capability be determined by the procedure acceptable to the authority having jurisdiction. It is also intended that the timing of drills, the rating of residents, and similar actions related to determining the evacuation capability be performed by persons approved by or acceptable to the authority having jurisdiction. The evacuation capability can be determined by the use of the definitions in 3.3.76, the application of NFPA 101A, *Guide on Alternative Approaches to Life Safety,* Chapter 6, or a program of drills (timed).

1.3.3

The index method addressed in 1.3.3 is in reference to hazard or risk/hazard indexing employed in the five fire safety evaluation systems (FSESs) presented in Chapters 4 through 5 and 7 through 9. Chapter 6, in its system for determining evacuation capability for board and care occupancies, was produced by other than hazard or risk/hazard indexing.

The hazard or risk/hazard indexing systems presented in the FSESs were developed utilizing a version of the Delphi method, recognizing that decisions from a structured group of experts are more accurate than those from individuals acting alone or in loosely structured groups. The first FSES, addressing health care occupancies and contained in current Chapter 4, was developed in the late 1970s at what was then the Fire Safety Engineering Division of the Center for Fire Research at the National Bureau of Standards (today a part of the National Institute of Standards and Technology — NIST). A team of expert fire scientists, fire protection engineers, and related researchers met in face-to-face sessions. Factors affecting equivalency, relative to requirements of NFPA *101* for health care occupancies, and the weighting of those factors were identified, quantified, and refined through rounds of meetings in response to the input of the team members. Over subsequent iterations of the process, the team converged on what became the first FSES. NFPA published the FSES for health care occupancies as advisory Appendix C of NFPA *101*-1981.

Additional FSESs, addressing detention and correctional occupancies and board and care facilities, as well as a procedure for determining evacuation capability for board and care facilities, were published as advisory appendices to the 1985 edition of NFPA *101*. In 1988, the material was moved to the first edition of NFPA 101A, at which time an FSES for business occupancies was added.

Chapter 2

Chapter 2 provides an accurate list of all NFPA and non-NFPA publications referenced throughout Chapter 1 and Chapters 3 through 9. It provides the edition date for each referenced publication that this edition of NFPA 101A intends to be used. Further, the referenced publications are shown with full title as not every citation, in Chapter 1 and Chapters 3 through 9, is complete. For example, throughout most of NFPA 101A, reference to NFPA *101, Life Safety Code*, is simplified to read as NFPA *101*.

2.2

It is NFPA policy, relative to the referencing of NFPA publications, to cite the most current edition available at time of document issuance. Thus, the 2013 edition of NFPA 101A cites the 2013 editions of NFPA 13, *Standard for the Installation of Sprinkler Systems*, and *NFPA 72®*. *National Fire*

Alarm and Signaling Code. Yet, as explained in 1.3.2 and the associated annotated text, the 2013 edition of NFPA 101A is tied to the 2012 edition of NFPA *101*. NFPA *101*-2012 references the 2010 editions of NFPA 13 and *NFPA 72*. This should not present a problem to the AHJ where an equivalency prepared in accordance with NFPA 101A-2013 depends on the presence of automatic sprinklers in accordance with NFPA 13 or a fire alarm system in accordance with *NFPA 72*, as NFPA *101*-2012 A.2.1(3) and its advisory annex state the following:

> **2.1(3)** Existing buildings or installations that do not comply with the provisions of the codes or standards referenced in this chapter shall be permitted to be continued in service, provided that the lack of conformity with these documents does not present a serious hazard to the occupants as determined by the authority having jurisdiction.
>
> **A.2.1(3)** The Committee on Safety to Life recognizes that it is sometimes impractical to continually upgrade existing buildings or installations to comply with all the requirements of the referenced publications included in Chapter 2.

The bullet (•) that appears between the entries for NFPA 252 and NFPA 265 indicates the deletion of NFPA 255, which was withdrawn and replaced within NFPA *101* and NFPA 101A by references to the ASTM equivalent fire test standard, ASTM E 84, and the UL equivalent fire test standard, ANSI/UL 723. See the entry for ASTM E 84 in 2.3.1 and the entry for ANSI/UL 723 in 2.3.3.

Chapter 3

Chapter 3 provides definitions. See Section 3.1, General. Also, see the annotated text associated with Section 3.3, General Definitions, relative to relying on the definitions of NFPA *101* when using NFPA 101A.

3.2

Official definitions are under the purview of the NFPA Standards Council, not the Technical Committee on Alternative Approaches that writes this guide. They are the same in all NFPA documents.

3.2.3

NFPA 101A is a guide, as contrasted with a code or a standard. Each of the terms *guide, code,* and *standard* has an NFPA official definition. The term *guide* is defined in 3.2.3 and repeated below for easy comparison with the NFPA official definitions of *code* and *standard*, which, although not appearing in NFPA 101A, are also shown.

> **Guide.** A document that is advisory or informative in nature and that contains only nonmandatory provisions. A guide may contain mandatory statements such as when a guide can be used, but the document as a whole is not suitable for adoption into law.
>
> **Code.** A standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law independently of other codes and standards.
>
> **Standard.** A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

3.2.6

NFPA 101A is unique in that, although it is a guide, the chapters presenting FSESs (Chapters 4 through 5 and 7 through 9) utilize the word *shall*. The context in which the FSESs are written in mandatory language is explained at the beginning of each FSES chapter in the general provisions. For example, 4.1.1, applicable to the FSES for health care occupancies, states the following:

> **4.1.1** This chapter is part of an NFPA guide and, therefore, is not mandatory. The term *shall* in this chapter is used to indicate that if the provisions of the chapter are applied, the procedures mandated are to be followed to ensure the effectiveness of the evaluation system.

3.3

The general definitions section, Section 3.3, is shown as being reserved. Yet, NFPA 101A is tied to NFPA *101* as detailed in 1.3.2 and the associated annotated text. Terms used in NFPA 101A, for which a definition appears in NFPA *101*, are meant to be defined per the NFPA *101* definition.

Chapter 4

Chapter 4 presents the first of five fire safety evaluation systems (FSESs). Each FSES applies to a specific occupancy. Each FSES provides a formalized method or tool for measuring the level of life safety against that required by NFPA *101*-2012, *Life Safety Code*, for use in an equivalency submittal to the authority having jurisdiction (AHJ).

Chapter 4 applies only to the inpatient form of health care addressed in NFPA *101* Chapter 18, New Health Care Occupancies, and Chapter 19, Existing Health Care Occupancies. Inpatient health care includes hospitals, nursing homes, and limited care facilities. There is no NFPA 101A FSES for the outpatient form of health care occupancies addressed in NFPA *101* Chapter 20, New Ambulatory Health Care Occupancies, and Chapter 21, Existing Ambulatory Health Care Occupancies. NFPA 101A Chapter 8, Fire Safety Evaluation System for Business Occupancies, is not appropriate for use with ambulatory health care occupancies. Equivalencies related to ambulatory health care occupancies need to be prepared using tools other than those provided in NFPA 101A.

4.1.1

NFPA 101A is unique in that, although it is a guide, the chapters presenting FSESs utilize the word *shall*. The context in which the health care occupancies FSES is written in mandatory language is explained in the second sentence of 4.1.1.

4.1.2

NFPA *101* applies both to new construction and to existing buildings. Where a new health care occupancy is compliant with the requirements of NFPA *101* Chapter 18 for new health care occupancies, there is no need to utilize NFPA 101A Chapter 4. Similarly, where an existing health care occupancy is compliant with the requirements of NFPA *101* Chapter 19 for existing health care occupancies, there is no need to utilize NFPA 101A Chapter 4. The user of NFPA *101* Chapter 18 or 19 might employ NFPA 101A where the facility is not compliant with the requirements of the applicable chapters of NFPA *101* and an equivalency submittal is to be prepared for submittal to the AHJ.

NFPA 101A presents a formalized method for preparing an equivalency submittal, for health care occupancies, in accordance with the equivalency concept permitted by NFPA *101* Section 1.4, which reads as follows:

> **1.4* Equivalency.** Nothing in this *Code* is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this *Code*.
>
> **1.4.1 Technical Documentation.** Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.
>
> **1.4.2 Approval.** The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.
>
> **1.4.3* Equivalent Compliance.** Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this *Code*.

Once the AHJ approves an NFPA 101A equivalency submittal as providing a facility with life safety that, *in toto*, is equivalent to that provided by compliance with all applicable provisions of NFPA *101*, such facility is deemed to comply with NFPA *101* as stated above in the text from NFPA *101* 1.4.3. However, such equivalency is relative to compliance with the provisions of a specific edition of NFPA *101*. Where a jurisdiction adopts a newer edition of NFPA *101*, the equivalency submittal will need to be conducted anew, utilizing the applicable editions of NFPA *101* and NFPA 101A. For example, in a jurisdiction that enforces the 2000 edition of NFPA *101*,

an equivalency submittal is prepared using the 2001 edition of NFPA 101A. The jurisdiction then updates to the 2012 edition of NFPA *101*, and a new equivalency submittal is prepared using the 2013 edition of NFPA 101A.

As an example of the case cited in the previous paragraph, at the time a health care occupancy equivalency submittal was prepared for an existing hospital per NFPA 101A-2001, the hospital was subject to the requirements of NFPA *101*-2000 for an existing health care occupancy. The NFPA 101A FSES mandatory values used for the hospital were those applicable to existing hospitals. In 2013, the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used for the existing hospital are those applicable to existing hospitals. The new equivalency submittal reflects that the NFPA *101* requirements applicable to existing hospitals might have changed between the 2000 and 2012 editions.

As another example, at the time a health care occupancy equivalency submittal was prepared for a hospital per NFPA 101A-2001, the hospital was new and subject to the requirements of NFPA *101*-2000 for a new health care occupancy. The NFPA 101A FSES mandatory values used for the hospital were those applicable to new hospitals. In 2013, the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used, for what has become an existing hospital, are those applicable to existing hospitals. Some might argue that the hospital is being held to a lesser level of scrutiny given that it is to be evaluated via the provisions applicable to existing buildings, which typically are less stringent than those applied to new construction. They are concerned that the new equivalency submittal, based on the mandatory values of NFPA 101A applicable to existing hospitals, will permit life safety features to go unrecognized that were abandoned, or not otherwise maintained, in the years between equivalency submittals. Given that NFPA *101* and NFPA 101A are to be used together, such situation is avoided because the AHJ will enforce the following provision of NFPA *101*-2012:

> **4.6.12.2** No existing life safety feature shall be removed or reduced where such feature is a requirement for new construction.

4.1.3

The provisions of 4.1.3 help make clear that the FSES is more than the forms presented in Worksheet 4.7.1 through Worksheet 4.7.11. The four pages of forms are supplemented by nearly seven pages of text detailing, mainly, the considerations requiring attention for purposes of completing Worksheet 4.7.2 related to occupancy risk parameter factors and Worksheet 4.7.4 related to safety parameter values. In addition to the forms and detailed text of 4.2 through 4.6.13.4.3, the NFPA 101A user needs a well-based foundation in the use of NFPA *101* Chapters 18 and 19, and related core Chapters 1 through 11. **Note that persons without experience in the use of NFPA *101* should not attempt an equivalency submittal preparation using NFPA 101A.** Each equivalency submittal needs to be evaluated, via careful scrutiny of the AHJ, with due consideration of the preparer's credentials.

4.2.1

The provisions of 4.2.1 direct the user to evaluate every fire zone. Yet, it might not be necessary to evaluate all zones depending on the purpose for which the FSES is applied, as detailed in the two examples that follow.

Example 1. An existing, sprinklered, four-story Type II(111) building that houses nursing home residents on all four floors, in similar floor plans and arrangements, is deficient in building construction type, as addressed in NFPA *101* 19.1.6. The FSES is to be used to prepare an equivalency submittal documenting whether other fire and life safety features, provided in excess of *Code* requirements, can compensate for the deficient building construction type. In such a case, it will typically be necessary to evaluate a fire zone on each floor because the Safety Parameter Values associated with Type II(111) construction in Safety Parameter 1, "Construction," of Worksheet 4.7.6 vary depending on fire zone location — first floor, second floor, third floor, or fourth floor and above.

Example 2. A new hospital is planned to comply with the requirements of NFPA *101* Chapter 18 except those relative to suite size, as the intensive care unit (ICU) will exceed the 10,000 ft^2 (930 m^2) maximum size as addressed in NFPA *101* 18.2.5.7.2.3(C) for sleeping suites. It might be sufficient for purposes of an equivalency submittal to evaluate only one fire zone, that constituting the ICU as addressed in NFPA 101A 4.3.2(5)(d).

The provisions of 4.2.1 also direct the user to perform the evaluation of the fire zone using Worksheet 4.7.1 through Worksheet 4.7.11 of Figure 4.7, found on pages 101A-13 through 101A-16. In completing the worksheets, the user should rely heavily on the text portion of the chapter presented in Sections 4.3 through 4.6.

4.2.2

Worksheet 4.7.10 is included as part of the FSES in recognition that the risk/hazard indexing system (see annotated text associated with 1.3.3) employing the safety parameters of Worksheet 4.7.6 does not evaluate some considerations required by NFPA *101* for *Code* compliance. Those considerations must be considered separately. The combined effect of the equivalency evaluation performed using Worksheet 4.7.1 through Worksheet 4.7.9 and the additional evaluation performed using Worksheet 4.7.10 are addressed, as conclusions, in Worksheet 4.7.11.

4.2.3

For the 2013 edition of NFPA 101A, Worksheet 4.7.11 was revised to formalize the process of concluding whether equivalency has been achieved by taking into account both the equivalency evaluation performed using Worksheets 4.7.1 through 4.7.9 and the additional evaluation performed using Worksheet 4.7.10.

4.3

The text associated with defining and selecting fire/smoke zones is extensive, and includes 4.3.1 through 4.3.2(5)(e). The subject is particularly important in that it establishes boundaries around each building area requiring an individual equivalency evaluation using Worksheets 4.7.1 through 4.7.11.

4.3.1

The provisions of 4.3.1 dictate that floors, horizontal exits, or smoke barriers establish the boundaries for a fire/smoke zone. It does not warn the user that the guideline is changed by provisions such as 4.3.2(5)(c), (d), and (e) relative to a suite of rooms constituting a zone, even if such suite is separated from the remainder of the floor by corridor walls or equivalent walls between suites, and not by horizontal exits or smoke barriers. The user needs to read through all the provisions of 4.3.2 to learn the intricacies of zone selection.

4.3.2

The fourth sentence of 4.3.2 advises that for a complete evaluation, every zone in the health care facility should be evaluated individually. The text goes on to temper that guideline by advising that from a practical standpoint, most health care facilities have repetitive arrangements so that a complete picture can be developed by evaluating typical zones until all combinations are evaluated. See the annotated text related to 4.2.1, providing examples of conditions under which it might not be necessary to evaluate all zones depending on the purpose for which the FSES is applied.

4.4

The provision of 4.4 makes clear that the presence of a building feature or system does not, by itself, provide positive credit in the evaluation. Such feature or system needs to be maintained in order to receive credit contributing toward the equivalency. For example, where a manual fire alarm system without emergency forces notification is present but not maintained, Safety Parameter 11 of Worksheet 4.7.6 would be scored with a value of -4, rather than a value of +1.

4.5

The health care occupancies FSES, as presented in Chapter 4, is different from the FSESs for detention and correctional, board and care, business, and educational occupancies in that it includes an additional consideration relative to occupancy risk. The occupancy risk consideration, as detailed in the text of 4.5 through 4.5.5.2 and recorded in Worksheet 4.7.2 through Worksheet 4.7.5, fits into the equivalency determination by establishing the mandatory value for the individual safety evaluation labeled as General Safety (S_4). See the last line of Worksheet 4.7.9.

In the FSES for detention and correctional, board and care, business, and educational occupancies, the individual safety evaluation labeled as General Safety (S_4) uses a fixed mandatory value that is independent of an occupancy risk consideration specific to the zone being evaluated. In the FSES for health care occupancies, an Occupancy Risk *(R)* value is calculated for each zone being evaluated. See the text of 4.5(1) through (4), where the concept is well explained.

Nursing home residents are typically referred to as residents, rather than patients. Where the FSES is performed for a nursing home, the word *resident* should be substituted for the word *patient* in 4.5.1, 4.5.2, 4.5.4, and 4.5.5, where the categories of patient mobility, patient density, ratio of patients to attendants, and patient average age are addressed.

4.5.1

Where the zone being evaluated has no patients, the patient mobility risk factor value, as addressed in Risk Parameter 1 in Worksheet 4.7.2, should be scored as 1.0. This is consistent with the text of 4.3.2(4)(a), which directs the user to set the value of factor *F* in Worksheet 4.7.3 to the assigned value of factor *L*, Zone Location, from Worksheet 4.7.2. In other words, the patient mobility, patient density, ratio of patients to attendants, and patient average age risk parameters are set to unity, and the only factor to have an effect on the occupancy risk is that for zone location.

The text of 4.5.1.1 and 4.5.1.2, applicable to the patient mobility risk factor, is well explained so as to obviate the need for additional annotated text.

4.5.2

Where the zone being evaluated has no patients, the patient density risk factor value, as addressed in Risk Parameter 2 in Worksheet 4.7.2, should be scored as 1.0. This is consistent with the text of 4.3.2(4)(a), which directs the user to set the value of factor *F* in Worksheet 4.7.3 to the assigned value of factor *L*, Zone Location, from Worksheet 4.7.2. In other words, the patient mobility, patient density, ratio of patients to attendants, and patient average age risk parameters are set to unity, and the only factor to have an effect on the occupancy risk is that for zone location.

The text of 4.5.2.1 and 4.5.2.2, applicable to the patient density risk factor, is well explained so as to obviate the need for additional annotated text.

4.5.4

Where the zone being evaluated has no patients, the ratio of patients to attendants risk factor value, as addressed in Risk Parameter 4 in Worksheet 4.7.2, should be scored as 1.0. This is consistent with the text of 4.3.2(4)(a), which directs the user to set the value of factor *F* in Worksheet 4.7.3 to the assigned value of factor *L*, Zone Location, from Worksheet 4.7.2. In other words, the patient mobility, patient density, ratio of patients to attendants, and patient average age risk parameters are set to unity, and the only factor to have an effect on the occupancy risk is that for zone location.

The text of 4.5.4.1 through 4.5.4.2.2, applicable to the ratio of patients to attendants risk factor, is well explained so as to obviate the need for additional annotated text.

4.5.5

Where the zone being evaluated has no patients, the patient average age risk factor value, as addressed in Risk Parameter 5 in Worksheet 4.7.2, should be scored as 1.0. This is consistent with the text of 4.3.2(4)(a), which directs the user to set the value of factor *F* in Worksheet 4.7.3 to the assigned value of factor *L*, Zone Location, from Worksheet 4.7.2. In other words, the patient mobility, patient density, ratio of patients to attendants, and patient average age risk parameters are set to unity, and the only factor to have an effect on the occupancy risk is that for zone location.

The text of 4.5.5.1 and 4.5.5.2, applicable to the patient average age risk factor, is well explained so as to obviate the need for additional annotated text.

4.6

The text of 4.6 explains the FSES developers' rationale for choice of safety parameters, why some components of a safety parameter need to be heavily emphasized, and — by omission from Worksheet 4.7.6 — factors that need not be directly evaluated in the FSES. See the annotated text related to 4.2.2 explaining that Worksheet 4.7.6 does not evaluate some considerations required by NFPA *101* for *Code* compliance. Those considerations must be considered separately, using Worksheet 4.7.10.

4.6.1

The text associated with scoring Safety Parameter 1, "Construction," of Worksheet 4.7.6 appears in 4.6.1 through 4.6.1.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 1, is reflected in the third position of the related text paragraph numbers, in this case 4.6.1. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 1, "Construction," of Worksheet 4.7.6 is not formatted as clearly as comparable construction safety parameters in other FSES chapters of NFPA 101A. For example, the three columns at the right side of the parameter values address Type I and Type II construction. The user might be incorrectly led to believe that there is a Type I(000), Type I(111), and Type II(222) construction — there are no such construction types. See, for example, Worksheet 5.5.3 or Worksheet 9.6.2, where the building construction types are shown more completely, with less abbreviation. The user needs to be familiar with the building construction type notations as used in NFPA *101* 18.1.6 and 19.1.6 and explained further in NFPA *101* Table A.8.2.1.2.

Building construction type, relative to the story of the health care occupancy zone being evaluated, is an important consideration in the FSES. The health care occupancy provisions of NFPA 101 employ a defend-in-place strategy permitting horizontal relocation to an adjacent smoke compartment. The building must have structural integrity to avoid collapse well into a fire.

4.6.1.1

The provision of 4.6.1.1 is consistent in concept with that expressed in NFPA *101* 8.2.1.3. The term *additions or connected structures* is meant to apply to sections of the building that sit side-by-side, and not the condition where floors of a given construction type are stacked atop floors of a different construction type. NFPA *101* 8.2.1.3 clarifies the issue by referring to the separating barrier between the differing construction types as a vertically aligned fire barrier.

4.6.1.2

The provision of 4.6.1.2 applies the building construction type consideration in a slightly different way than NFPA *101* 18.1.6 and 19.1.6. In NFPA *101* the minimum construction criteria are applied based on the total number of stories in the building, even if the upper stories are not occupied as health care occupancies. In the NFPA 101A evaluation, Safety Parameter 1, "Construction," of Worksheet 4.7.6 is scored based on consideration of the floor of the fire zone being evaluated. So as not to lose the construction concept employed by NFPA *101*, the provision of NFPA 101A 4.3.2(4)(c) allows evaluation of unoccupied floors above the health care occupancy to be omitted only if such unoccupied floors meet the construction requirements of NFPA *101* 18.1.6 for new buildings or NFPA *101* 19.1.6 for existing buildings, or if each unoccupied floor is protected by automatic sprinklers.

4.6.2

The text associated with scoring Safety Parameter 2, "Interior Finish (Corridors and Exits)," of Worksheet 4.7.6 appears in 4.6.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 2, is reflected in the third position of the related text paragraph number, in this case 4.6.2. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note that the interior finish consideration, required for scoring Safety Parameter 2 and Safety Parameter 3 of Worksheet 4.7.6, includes both interior wall finish and interior ceiling finish. Walls and ceilings are grouped into the category of *interior wall and ceiling finish* as used in NFPA *101* 10.2.3.

In scoring any safety parameter of Worksheet 4.7.6 it is paramount that the surveyor choose the value associated with what is present. This is particularly important relative to the interior finish safety value. NFPA *101* permits the required interior wall or ceiling classification to be reduced by one category due to the presence of automatic sprinkler protection (e.g., where the *Code* requires nothing inferior to Class B, the presence of sprinklers permits the use of Class C). If the surveyor sees existing Class C interior finish (i.e., flame spread index of between 76 and 200), the surveyor is to circle the safety parameter value for Class C regardless of the presence of sprinklers, not that for Class B — although this rule is changed in one case as explained in the next paragraph. The FSES mandatory values (as addressed in Worksheet 4.7.8A through Worksheet 4.7.8C) are calibrated to provide credit for sprinklers without the surveyor taking credit

for the presence of sprinklers relative to the scoring of Safety Parameter 2 and Safety Parameter 3. This prevents the surveyor from incorrectly taking a double credit.

Worksheet 4.7.6, Note *f*, modifies, in one special case, the "circle the value that you see" guideline of the above paragraph. Where Safety Parameter 13, "Automatic Sprinklers," is scored as *None*, with the associated value of 0, but the corridor is protected by sprinklers, Class C and Class B interior finish are scored using the parenthetical value shown in the appropriate cell of the lines associated with Safety Parameter 2 and Safety Parameter 3.

The sentence relative to Class D and Class E interior finish materials not being permitted says, in effect, that any material with a flame spread index exceeding 200 is not acceptable as an interior wall or ceiling finish material. Where the presence of an interior wall or ceiling finish material with a flame spread index exceeding 200 is noted, the equivalency evaluation using this FSES is ended. Equivalency must be substantiated by a method other than that provided by the FSES of NFPA 101A.

Worksheet 4.7.6, Note *f*, awards additional points where the corridor with the Class C or Class B interior finish is sprinklered and Safety Parameter 13, "Automatic Sprinklers," is scored as 0 because the habitable spaces are not sprinklered. This is consistent with NFPA *101* 10.2.8.1, which permits Class C interior finish materials to be used where Class B is required if the area is sprinklered, and permits Class B interior finish materials to be used where Class A is required if the area is sprinklered.

4.6.3

The text associated with scoring Safety Parameter 3, "Interior Finish (Rooms)," of Worksheet 4.7.6 appears in 4.6.3. The worksheet value should not be scored without consulting the text portion of the document that refers the user to the text in 4.6.2, as the guidelines for scoring interior finish in rooms are the same as those for scoring interior finish in corridors and exits. Note that the safety parameter number, in this case 3, is reflected in the third position of the related text paragraph number, in this case 4.6.3. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

See the second, third, and fourth paragraphs of the annotated text associated with 4.6.2.

4.6.4

The text associated with scoring Safety Parameter 4, "Corridor Partitions/Walls," of Worksheet 4.7.6 appears in 4.6.4 through 4.6.4.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 4, is reflected in the third position of the related text paragraph numbers, in this case 4.6.4. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The corridor partitions/walls, as addressed in Safety Parameter 4 of Worksheet 4.7.6, are scored relative to their time-rated fire resistance rating.

The text of 4.6.4 directs that the omission of corridor doors results in the scoring of Safety Parameter 4 of Worksheet 4.7.6, relative to corridor partitions/walls, with a value of -10. Worksheet 4.7.6, Note *a*, then permits the score to be changed to a value of 0 if Safety Parameter 5, relative to corridor doors, is scored as a value of -10. The penalty for omitting doors is applied only once in the combined considerations of Safety Parameter 4 and Safety Parameter 5. The purpose of initially scoring the partition wall with a value of -10 is to prohibit taking any positive credit (i.e., a value of +1 or +2) regardless of the fire resistance rating of the partition/wall if doors are omitted.

4.6.4.1

The user is advised to score Safety Parameter 4, "Corridors Partitions/Walls," of Worksheet 4.7.6 based on what is present. Consider the case where an existing corridor wall, separating a nursing home resident room from a corridor, has no fire resistance rating but is solid, resists the passage of smoke, and terminates tightly against the underside of a ceiling that is, itself, resistant to the passage of smoke. The arrangement described occurs in a sprinklered smoke compartment as permitted by NFPA *101* 19.3.6 as an exemption to the requirement that the corridor wall provide a minimum of ½-hour fire resistance rating. The user is not to assume that the arrangement permits the wall to be scored as "≥ ½ hr to <1 hr" with the associated value of 1 just because the *Code* considers such arrangement acceptable in a sprinklered smoke compartment. Rather, the user is to score the safety parameter as "<½ hr" with its associated value of 0. The FSES mandatory values (addressed in Worksheet 4.7.8B as applicable to an existing nursing home) are calibrated

to provide credit for sprinklers without the surveyor taking credit for the presence of sprinklers relative to the scoring of Safety Parameter 4. This prevents the surveyor from incorrectly taking a double credit.

4.6.4.2

Worksheet 4.7.6, Note *a*, has the effect of lessening the compounding effect of incomplete walls (Safety Parameter 4) and missing doors (Safety Parameter 5), as explained in the third paragraph of the annotated text associated with 4.6.4. Similarly, Note *a* has the effect of negating point values of +1 or +2 that would otherwise be scored for corridor walls having a fire resistance rating of more than ½ hour and 1 or more hours, respectively, where corridor doors are missing. The evaluation system recognizes that good corridor walls do not improve a situation where doors are missing.

4.6.5

The text associated with scoring Safety Parameter 5, "Doors to Corridors," of Worksheet 4.7.6 appears in 4.6.5 through 4.6.5.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 5, is reflected in the third position of the related text paragraph numbers, in this case 4.6.5. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note that the consideration of corridor doors is limited in scope to the corridor doors addressed in NFPA *101* 18.3.6 and 19.3.6. That means that doors for the protection of vertical openings (such as exit stair enclosure doors) and doors for the protection of hazardous areas (such as doors to storage rooms) are excluded from this consideration. Doors for the protection of vertical openings are addressed in Safety Parameter 7 of Worksheet 4.7.6. Doors for the protection of hazardous areas are addressed in Safety Parameter 8 of Worksheet 4.7.6. See the text associated with 4.6.7 and 4.6.8.

4.6.5.3

The provision of 4.6.5.3 clarifies that minimum 1 ¾ in. (44 mm) thick, solid, bonded wood core doors are permitted to be scored as having a ≥20-minute fire protection rating, even where such door is not a listed fire door assembly. Further, NFPA *101* typically requires the door leaf of a fire-rated assembly to be self-closing. But NFPA *101* 18.3.6.3.11 and 19.3.6.3.11 permit self-closers to be omitted from patient room doors. The absence of a self-closer permits the solid core door, addressed above, to be scored as having a ≥20-minute fire protection rating. Similarly, a 20-minute fire protection–rated door assembly for which the self-closing device is not installed is permitted to be scored as having a ≥20-minute fire protection rating.

Worksheet 4.7.6, Note *d*, has the effect of negating point values of +1 or +2 that would otherwise be scored for corridor doors having a fire protection rating of ≥20 minutes and ≥20 minutes with automatic closer, respectively, where corridor walls are incomplete. The evaluation system recognizes that good doors do not improve a situation where walls are incomplete.

4.6.6

The text associated with scoring Safety Parameter 6, "Zone Dimensions," of Worksheet 4.7.6 appears in 4.6.6 through 4.6.6.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 6, is reflected in the third position of the related text paragraph numbers, in this case 4.6.6. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The "Zone Dimensions" consideration of Safety Parameter 6 of Worksheet 4.7.6 relate to the dimensions of smoke compartments as addressed in NFPA *101* 18.3.7 and 19.3.7. Note that zone length applies to the greater dimension of the smoke compartment, regardless of whether that greater dimension is called the length or the width. The concept is captured in the text of 4.6.6.4.

Worksheet 4.7.6, Note *b*, lessens the effect of negative values that would typically be scored in Safety Parameter 6 where dead-end corridors or excessive zone length exist and fewer than two emergency movement routes, as addressed in Safety Parameter 10, are provided. The evaluation system works properly without having to assess a double penalty.

4.6.6.1

The provision of 4.6.6.1 explains dead-end corridor measurement in a manner consistent with that of NFPA *101* A.7.5.1.5. The user of NFPA 101A needs to be familiar with the provisions of

NFPA *101*, but there is no assurance the user would otherwise know to consult the advisory annex. Thus, NFPA 101A 4.6.6.1 provides desirable redundancy.

Safety Parameter 6, "Zone Dimensions," of Worksheet 4.7.6 is scored using a two-step approach. First, the user determines whether the zone being evaluated has any dead-end corridors in excess of 30 ft (9.1 m). If *yes*, the user works in the three columns at the center of the table (i.e., those grouped under the heading *Dead End*) and scores the value based on the longest dead-end corridor. If *no*, the user works in the three columns at the right of the table and scores the value based on the maximum dimension of the smoke compartment.

Note *c* to Worksheet 4.7.6 recognizes that NFPA *101* requires existing health care occupancies to have smoke barriers, to subdivide a floor into smoke compartments, only if the floor is used for sleeping by more than 30 patients.

Note *h* to Worksheet 4.7.6 recognizes that NFPA *101* limits new smoke compartments to a maximum area and travel distance arrangement, and not to a maximum zone length criterion. Similarly, Note *h* to the worksheet recognizes that NFPA *101* permits existing smoke compartments to comply with a maximum area and travel distance arrangement in lieu of a maximum zone length criterion. It is important to read all applicable notes so as not to unfairly score the applicable safety parameter.

4.6.6.3

The provision of 4.6.6.3 is important in establishing that the zone being evaluated is not to be penalized twice where a single movement route involves a dead-end corridor. Thus, where Safety Parameter 10, "Emergency Movement Routes," of Worksheet 4.7.6 is identified as "<2 Routes" with the associated score of -8, the consideration is adequately assessed without the additional penalty that would otherwise result from consideration of dead-end corridor length. See Note *b* of Worksheet 4.7.6.

4.6.7

The text associated with scoring Safety Parameter 7, "Vertical Openings," of Worksheet 4.7.6 appears in 4.6.7 through 4.6.7.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 7, is reflected in the third position of the related text paragraph numbers, in this case 4.6.7. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 7, "Vertical Openings," of Worksheet 4.7.6 considers all forms of vertical openings, not just those associated with egress routes such as penetrations of exit stair enclosures.

Where Worksheet 4.7.10, Item C, requires the user to evaluate whether the facility's HVAC systems comply with the provisions of NFPA *101* Section 9.2 (i.e., compliance with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*), such evaluation is made using the requirements of NFPA 90A other than those related to enclosure of vertical openings, as the subject of vertical openings will have already been considered in Safety Parameter 7 of Worksheet 4.7.6.

Worksheet 4.7.6 Note *e* prevents the user from unfairly scoring a positive safety parameter value (i.e., a value of +2 or +3) where shafts with more than 1-hour fire resistance rating are present, if the zone being evaluated is located on the first floor of the building construction type for which floor assemblies are not required to have any fire resistance rating. The concept recognizes that a first floor zone is evaluated less harshly than zones on other floors, so the evaluation system should not credit a shaft system that does little to protect the floor. The concept also recognizes that a vertical shaft with high fire resistance rating does little to keep fire from spreading to another floor via a non-rated floor assembly.

4.6.8

The text associated with scoring Safety Parameter 8, "Hazardous Areas," of Worksheet 4.7.6 appears in 4.6.8 through 4.6.8.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 8, is reflected in the third position of the related text paragraph numbers, in this case 4.6.8. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The provision of 4.6.8 sends the user to NFPA *101* Section 8.7 to determine hazardous areas. The concept is one of identifying spaces within a health care occupancy where the contents/uses present a greater hazard than that typically associated with spaces such as patient

sleeping and treatment rooms. Hazardous areas are specifically addressed for health care occupancies in NFPA *101* in 18.3.2 and 19.3.2. The areas and uses listed in NFPA *101* Table 18.3.2.1 and 19.3.2.1.5 constitute hazardous areas requiring protection.

Note that 4.6.8 requires identification and evaluation of hazardous areas that are not only within the zone being evaluated but also those in adjacent (either side-by-side or below the zone) zones unless there is a minimum 2-hour fire resistance–rated separation between the zones.

4.6.8.1

Severe hazards are addressed in NFPA *101* 8.7.1.1(3) and include hazardous areas that are required to be separated from the remainder of the floor by minimum 1-hour fire resistance–rated barriers and protected by automatic sprinklers. All the entries in NFPA *101* Table 18.3.2.1 for which the second column requires 1-hour separation are to be considered severe hazards for purposes of applying NFPA 101A Table 4.6.8.1, as all new health care occupancy buildings are required to be sprinklered in accordance with 18.3.5.1. Existing hazardous areas subject to the provisions of NFPA *101* 19.3.2.1.5 are to be considered not severe hazards for purposes of applying NFPA 101A Table 4.6.8.1, as 19.3.2.1 requires the existing hazardous areas to be separated from the remainder of the floor by minimum 1-hour fire resistance–rated barriers or protected by automatic sprinklers.

4.6.9

The text associated with scoring Safety Parameter 9, "Smoke Control," of Worksheet 4.7.6 appears in 4.6.9 through 4.6.9.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 9, is reflected in the third position of the related text paragraph numbers, in this case 4.6.9. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The provisions of Safety Parameter 9, "Smoke Control," require the user to elect one of three options. Each is well defined in 4.6.9.1, 4.6.9.2, or 4.6.9.3.

4.6.10

The text associated with scoring Safety Parameter 10, "Emergency Movement Routes," of Worksheet 4.7.6 appears in 4.6.10 through 4.6.10.3.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 10, is reflected in the third position of the related text paragraph numbers, in this case 4.6.10. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The text for Safety Parameter 10, "Emergency Movement Routes," of Worksheet 4.7.6 is extensive and includes 4.6.10 through 4.6.10.3.4. The explanation is quite detailed and leaves little need for additional annotated text. The user should continue reading through all of the associated text of 4.6.10 even if it appears that an early paragraph provides the needed information for the zone being evaluated. With full knowledge of all the options for scoring emergency movement routes, the user can feel confident that nothing was overlooked and useful text was not abandoned prematurely.

4.6.10.3

The provision of 4.6.10.3 is presented to emphasize that the emergency movement route parameter needs to be scored accurately without diminishing the effect of any deficiency under the guise that the subject was already addressed via consideration of vertical openings in Safety Parameter 7. Yet, the text of 4.6.10.3 is not entirely accurate. Where 4.6.7.2, relative to Safety Parameter 7, "Vertical Openings," is used to take an increased positive value for a zone separation barrier that has more fire resistance rating than that offered by the shaft walls surrounding a vertical opening in an adjacent compartment, travel through that adjacent compartment is not credited with providing an emergency movement route for purposes of scoring Safety Parameter 10.

4.6.11

The text associated with scoring Safety Parameter 11, "Manual Fire Alarm," of Worksheet 4.7.6 appears in 4.6.11. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 11, is reflected in the third position of the related text paragraph number, in this case 4.6.11. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The consideration related to Safety Parameter 11, "Manual Fire Alarm," involves first determining whether a manual fire alarm system, as required and detailed by NFPA *101* 18.3.4 and 19.3.4, is provided. If such manual fire alarm system is provided, the user next needs to determine whether the fire alarm system is provided with fire department connection, as might be accomplished via an approved central station connection. See NFPA *101* 9.6.4.2.

4.6.12

The text associated with scoring Safety Parameter 12, "Smoke Detection and Alarm," of Worksheet 4.7.6 appears in 4.6.12 through 4.6.12.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 12, is reflected in the third position of the related text paragraph numbers, in this case 4.6.12. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The consideration scored in Safety Parameter 12 uses the term *smoke detection and alarm*, to emphasize that the smoke detection is a system that initiates the fire alarm system addressed in Safety Parameter 11, "Manual Fire Alarm." Further, the parameter is scored relative to the presence of smoke detection in the zone being evaluated. The lack of a smoke detection system in other zones does not affect the scoring of the parameter for the zone being evaluated.

Automatic sprinklers are heat detectors that provide fire control. Automatic sprinklers utilizing quick-response (QR) technology are expected to activate while the fire is small, initiating the fire alarm system before conditions in the vicinity of the operating sprinkler become untenable. QR sprinklers, therefore, provide some degree of early detection and notification. This is recognized by Worksheet 4.7.6 Note *g*, which provides as many as three extra points to Safety Parameter 12, "Smoke Detection and Alarm," based on the presence of QR sprinklers.

4.6.13

The text associated with scoring Safety Parameter 13, "Automatic Sprinklers," of Worksheet 4.7.6 appears in 4.6.13 through 4.6.13.4.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 13, is reflected in the third position of the related text paragraph numbers, in this case 4.6.13. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

See the third paragraph of the annotated text associated with 4.6.12 relative to Worksheet 4.7.6 Note *g*, which provides extra points to Safety Parameter 12, "Smoke Detection and Alarm," based on the presence of QR sprinklers.

4.7

A full set of worksheets — Worksheet 4.7.2 through Worksheet 4.7.11 — must be completed for each zone evaluated. The user will need multiple sets of forms. The NFPA 101A Origin and Development section, printed on page 101A-1, advises that the worksheets are copyrighted by NFPA, but users are permitted to copy them for private use.

4.7.1

Worksheet 4.7.1, Cover Sheet, identifies the zone being evaluated as well as other information that might remain relatively constant from one zone evaluation to another.

4.7.2

Worksheet 4.7.2, Occupancy Risk Parameter Factors, is utilized by circling the appropriate risk factor value associated with each risk parameter. For text and associated annotations related to occupancy risk, see 4.5 through 4.5.5.2.

4.7.3

The risk factor values, circled in Worksheet 4.7.2, are transferred to the corresponding blocks of Worksheet 4.7.3, Occupancy Risk Factor Calculation. The risk parameters (i.e., *M, D, L, T*, and *A*) are interdependent on, and not independent of, each other. The occupancy risk factor, *F*, is therefore calculated by multiplying the values by each other as denoted on the worksheet by the presence of multiplication symbols, ×. A calculated value that is not a whole number (e.g., 2.79) is recorded as calculated. There is no intent that a value be rounded, either up or down.

4.7.4

The occupancy risk factor, *F*, is transferred to Worksheet 4.7.4 or 4.7.5 — depending, respectively, on whether the zone being evaluated is new construction or an existing situation — and an

adjusted occupancy risk factor, *R*, is calculated. Note that Worksheet 4.7.5 adjusts the weighting of the occupancy risk factor for existing situations by considering only 60 percent of the value calculated in Worksheet 4.7.3. This is consistent with the philosophy of NFPA *101* that existing situations are held to a different set of requirements than new construction, as evidenced by the inclusion of Chapter 18 for new health care occupancies and Chapter 19 for existing health care occupancies.

The adjusted occupancy risk factor, *R*, is transferred to Worksheet 4.7.9, where it is stored awaiting completion of other needed information.

4.7.5

Worksheet 4.7.6 is employed, like Worksheet 4.7.2, by circling the value selected for each of the thirteen safety parameters. See the text, and associated annotations, in 4.6 through 4.6.13.4.3. Interspersed in the annotated text are individual explanations of Worksheet 4.7.6 Note *a* through Note *h*.

4.7.6

Each of the thirteen circled safety parameter values of Worksheet 4.7.6 is transferred to Worksheet 4.7.7, Individual Safety Evaluations. The word "individual" in the title of the worksheet emphasizes that safety is to be evaluated from multiple perspectives. The four safety evaluations conducted include containment safety (S_1), extinguishment safety (S_2), people movement safety (S_3), and general safety (S_4). Each of the safety parameter values needs to be transferred two, or three, or four times to Worksheet 4.7.7 depending on whether the safety parameter contributes to the specific safety evaluation. Where a safety parameter has no effect on a given safety evaluation, the corresponding cell of the worksheet is X-ed out. Note also that the safety parameter value associated with automatic sprinklers is weighted in the people movement safety evaluation column so as to have only half the effect that the other six applicable safety parameter values have. This is explained in the text of 4.6.13.2. The automatic sprinkler value is divided by two (as indicated by the ÷2= notation).

Each of the four columns of safety parameter values in Worksheet 4.7.7 is added. The text reminds the user that any negative numbers need to be deducted. The arithmetic exercises produce values for S_1, S_2, S_3, and S_4. Those values are transferred to Worksheet 4.7.9, which already contains the adjusted occupancy risk factor, *R*, calculated in Step 4.

4.7.7

The user first identifies which of the three mandatory safety requirements worksheets — Worksheet 4.7.8A, Worksheet 4.7.8B, or Worksheet 4.7.8C — is applicable to the zone being evaluated based on the title of each worksheet. Working within the applicable worksheet, the user circles the appropriate value in each of the three columns identified based upon whether the zone is subject to the requirements of NFPA *101* for new construction or existing situations, and the floor where the zone is located.

Note that Worksheet 4.7.8A, Worksheet 4.7.8B, and Worksheet 4.7.8C address only three of four subjects addressed in the individual safety evaluations of Worksheet 4.7.7. No mandatory safety requirement is specified for general safety, as that mandatory requirement value is derived uniquely for the zone in question via the occupancy risk consideration addressed in 4.5 through 4.5.5.2 and calculated as the adjusted occupancy risk factor, *R*, from Step 4.

The mandatory safety requirements values contained in Worksheet 4.7.8A, Worksheet 4.7.8B, and Worksheet 4.7.8C are calculated by the technical committee responsible for NFPA 101A to reflect a code-compliant situation in accordance with the requirements of NFPA *101*-2012. For a more detailed explanation, see the NFPA 101A annex material numbered A.1.3.1.

The mandatory safety requirements values — S_a for containment, S_b for extinguishment, and S_c for people movement — are transferred to Worksheet 4.7.9.

4.7.8

Eight of the twelve boxes in Worksheet 4.7.9 represent values transferred in earlier steps as follows:

1. The values for S_1, S_2, S_3, and S_4 represent individual fire safety evaluations values calculated in Worksheet 4.7.7 and transferred to Worksheet 4.7.9 in Step 6.

2. The values for S_a, S_b, and S_c represent the mandatory safety requirements values selected from Worksheet 4.7.8A, Worksheet 4.7.8B, or Worksheet 4.7.8C and transferred to Worksheet 4.7.9 in Step 7.
3. The value for *R* represents the adjusted occupancy risk factor calculated in Worksheet 4.7.4 or Worksheet 4.7.5 and transferred to Worksheet 4.7.9 in Step 4.

The values for the remaining four boxes, represented by *C*, *E*, *P*, and *G*, are calculated by subtracting S_a from S_1, S_b from S_2, S_c from S_3, and *R* from S_4. The user then identifies whether each of the resultants, *C*, *E*, *P*, and *G*, is greater than, or equal to, zero. The appropriate box for *Yes* or *No* is checked.

4.7.9

Worksheet 4.7.10 is completed. See the text, and related annotation, on 4.2.2. All references in the worksheet are to NFPA *101*. Items A, C, D, F, G, and I must be checked either as *Met* or as *Not Met*. For Items B, E, H, J, K, and L, a third option exists for checking that the provision is *Not Applicable*. For example, Item B applies only to new facilities and is therefore not applicable to existing situations.

4.7.10

Worksheet 4.7.11, Conclusions, was revised for the 2013 edition to require mitigation of any considerations checked as *Not Met* in Worksheet 4.7.10 before a zone can be judged to provide fire and life safety equivalent to that prescribed in NFPA *101*.

(FIGURE 4.7) Worksheet 4.7.6 Safety Parameter Values

It is important that the user of the Chapter 4 FSES not attempt to score the parameter values of Worksheet 4.7.6 without consulting the associated text in 4.6 through 4.6.13.4.3. Those paragraphs are accompanied by significant annotated text on how to use the worksheet, including Note *a* through Note *h*.

For ease in moving between Worksheet 4.7.6 and the detailed text, note the correlative numbering scheme employed where the safety parameter number appears in the third position of the associated text paragraph number. The numbering scheme is illustrated in Exhibit 1.

Safety Parameter No.	Parameter Heading	Associated Text
1	Construction	4.6.**1**
2	Interior finish (corridors and exits)	4.6.**2**
3	Interior finish (rooms)	4.6.**3**
4	Corridor partitions/walls	4.6.**4**
5	Doors to corridor	4.6.**5**
6	Zone dimensions	4.6.**6**
7	Vertical openings	4.6.**7**
8	Hazardous areas	4.6.**8**
9	Smoke control	4.6.**9**
10	Emergency movement routes	4.6.**10**
11	Manual fire alarm	4.6.**11**
12	Smoke detection and alarm	4.6.**12**
13	Automatic sprinklers	4.6.**13**

Exhibit 1 Correlative numbering between safety parameter number and associated text.

(FIGURE 4.7) Worksheet 4.7.11

Zone Equivalency Evaluation Examples. The examples that follow use the NFPA 101A Chapter 4 health care occupancies FSES to evaluate a new zone of a hospital — the Oncology Services Building of City Hospital — because the single-zone building does not fully comply with the requirements of NFPA *101*, given that the clean utility (storage) room walls stop at the underside of the suspended ceiling and the room door is not fire-rated. The floor plan appears as Exhibit 2.

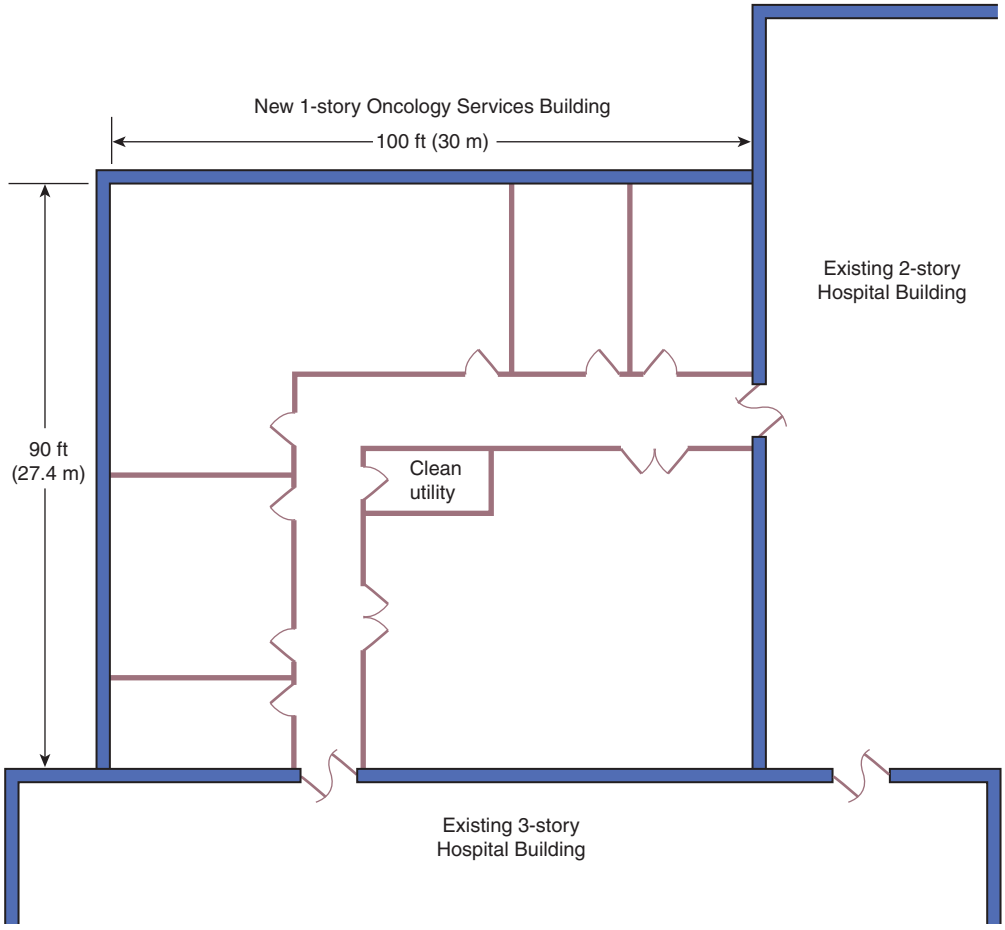

Exhibit 2 New Oncology Services Building floor plan.

The NFPA 101A user surveys the Oncology Services Building and takes note of features and conditions that must be considered in using the FSES. The survey notes follow.

1. The Oncology Services Building is a new one-story structure abutting a three-story and a two-story building within the large medical facility called City Hospital. The Oncology Services Building provides in-patient and out-patient treatment to cancer patients of all ages.
2. The patient mix in the Oncology Services Building varies from those who are fully ambulatory to those who are incapable of self-preservation and rely on staff to move them.
3. Eleven staff members normally occupy the Oncology Services Building when patients are present. All staff are well trained in the implementation of the facility's written emergency plan and their individual duties under fire and similar emergencies.
4. The oncology services exterior walls are of masonry construction, as are the walls of the two existing buildings that it abuts. The steel deck roof is supported on steel bar joists and steel columns.
5. Corridor walls are of painted concrete block to which protective plastic panels (flame spread index of 70) have been added up to a 4 ft (1.2 m) height.

6. Room-to-room partitions are painted gypsum wallboard on steel studs.
7. The corridor walls extend to the underside of a lay-in tile ceiling in a metal suspension grid. The ceiling/wall joint is tight so as to limit the transfer of smoke. No ceiling tiles are missing, and other penetrations, such as lighting fixtures, are shrouded so as to complete the smoke-resisting barrier.
8. The openings in the corridor walls are protected by doors of 1¾ in. (44 mm) thick, solid-bonded wood core construction; doors are smoke resistant, without self-closers but not blocked open.
9. The 200 ft^2 (18.6 m^2) clean utility (storage) room has the same wall/partition construction and doors as described above for the corridor walls and the room-to-room separations. However, these doors are self-closing.
10. The single-story Oncology Services Building has no vertical openings. Vertical openings in the abutting three-story and two-story buildings are enclosed as required by NFPA *101* 19.3.1.
11. The walls between the Oncology Services Building and the abutting three- and two-story buildings are constructed as smoke barriers in accordance with NFPA *101* 18.3.7.
12. The egress routes from the Oncology Services Building involve traveling down the corridor and through the smoke barriers into the adjacent buildings, where there are doors to the outside at grade level.
13. The manual fire alarm system in the Oncology Services Building reports as one zone of the medical facility's integrated alarm and communications systems. The fire alarm system is arranged to provide fire department notification automatically via a central station connection.
14. There are no smoke detectors in the Oncology Services Building except at the smoke barrier doors, which are automatic closing.
15. The entire medical facility is protected by automatic sprinkler systems. The sprinkler system in the Oncology Services Building uses quick-response sprinklers in all areas except the clean utility room, which is protected by standard response sprinklers. The sprinkler system is interconnected electrically with the facility's fire alarm system.

Initial Run — Evaluating the Current Conditions

Exhibit 3 presents the completed worksheets — Worksheet 4.7.1 through Worksheet 4.7.11 — using the FSES to evaluate the Oncology Services Building features, as they currently exist, as described in the fifteen numbered paragraphs above.

Note in Worksheet 4.7.9 that two of the four individual safety evaluations — those for Containment Safety and General Safety — fail to achieve the required score of 0 or greater, and are marked as such in the *No* column. The evaluator moves to Worksheet 4.7.11 and checks conclusion number 3. The level of fire safety is not shown by the FSES to be equivalent to that prescribed by NFPA *101* for health care occupancies.

WORKSHEET 4.7.1 COVER SHEET

Fire/Smoke Zone* Evaluation Worksheet for Health Care Facilities

Facility City Hospital Building Oncology Services
Zone(s) evaluated Floor 1 – Initial run – Actual conditions surveyed
Evaluator Ron Cote' Date 2/1/2013

Complete this worksheet for each zone. Where conditions are the same in several zones, one worksheet can be used for those zones.

*Fire/smoke zone is a space separated from all other spaces by floors, horizontal exits, or smoke barriers.

WORKSHEET 4.7.2 OCCUPANCY RISK PARAMETER FACTORS

Risk Parameters	Risk Factor Values					
1. Patient Mobility (*M*)	Mobility Status	Mobile	Limited Mobility	Not Mobile	Not Movable	
	Risk Factor	1.0	1.6	3.2	(4.5)	
2. Patient Density (*D*)	No. of Patients	1–5	6–10	11–30	>30	
	Risk Factor	1.0	1.2	1.5	(2.0)	
3. Zone Location (*L*)	Floor	1st	2nd or 3rd	4th to 6th	7th and Above	Basements
	Risk Factor	(1.1)	1.2	1.4	1.6	1.6
4. Ratio of Patients to Attendants (*T*)	Patients / Attendant	1–2 / 1	3–5 / 1	6–10 / 1	>10 / 1	One or More* / None
	Risk Factor	1.0	(1.1)	1.2	1.5	4.0
5. Patient Average Age (*A*)	Age	<65 Years and >1 Year		≥65 Years or ≤1 Year		
	Risk Factor	(1.0)		1.2		

*A risk factor of 4.0 is charged to any zone that houses patients without any staff in immediate attendance.

WORKSHEET 4.7.3 OCCUPANCY RISK FACTOR CALCULATION

	M		*D*		*L*		*T*		*A*		*F*
Occupancy Risk	[4.5]	×	[2.0]	×	[1.1]	×	[1.1]	×	[1.0]	=	[10.9]

WORKSHEET 4.7.4 ADJUSTED OCCUPANCY RISK FACTOR — NEW BUILDINGS

	F		*R*
1.0 ×	[10.9]	=	[10.9]

WORKSHEET 4.7.5 ADJUSTED OCCUPANCY RISK FACTOR — EXISTING BUILDINGS

	F		*R*
0.6 ×	[ ]	=	[ ]

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 3 Worksheets for initial run of FSES.

WORKSHEET 4.7.6 SAFETY PARAMETER VALUES

Safety Parameters	Parameter Values						
1. Construction	Combustible Types III, IV, and V				Noncombustible Types I and II		
Floor or Zone	000	111	200	211, 2HH	000	111	222, 322, 442
First	−2	0	−2	0	0	2	2
Second	−7	−2	−4	−2	−2	2	4
Third	−9	−7	−9	−7	−7	2	4
4th and Above	−13	−7	−13	−7	−9	−7	4

2. Interior Finish (Corridors and Exits)	Class C	Class B	Class A		
	−5(0)[f]	0(3)[f]	3		
3. Interior Finish (Rooms)	Class C	Class B	Class A		
	−3(1)[f]	1(3)[f]	3		
4. Corridor Partitions/Walls	None or Incomplete	<½ hr	≥½ hr to <1 hr	≥1 hr	
	−10(0)[a]	0	1(0)[a]	2(0)[a]	
5. Doors to Corridor	No Door	<20 min FPR	≥20 min FPR	≥20 min FPR and Auto Clos.	
	−10	0	1(0)[d]	2(0)[d]	

6. Zone Dimensions	Dead End			No Dead Ends >30 ft and Zone Length Is		
	>100 ft	>50 ft to 100 ft	30 ft to 50 ft	>150 ft	100 ft to 150 ft	<100 ft
	−6(0)[b]	−4(0)[b]	−2(0)[b]	−2(0)[c](0)[h]	0(0)[h]	1

7. Vertical Openings	Open 4 or More Floors	Open 2 or 3 Floors	Enclosed with Indicated Fire Resist.		
			<1 hr	≥1 hr to <2 hr	≥2 hr
	−14	−10	0	2(0)[e]	3(0)[e]
8. Hazardous Areas	Double Deficiency		Single Deficiency		No Deficiencies
	In Zone	Outside Zone	In Zone	In Adjacent Zone	
	−11	−5	−6	−2	0
9. Smoke Control	No Control	Smoke Barrier Serves Zone	Mech. Assisted Systems by Zone		
	−5(0)[c]	0	3		
10. Emergency Movement Routes	<2 Routes	Multiple Routes			Direct Exit(s)
		Deficient	W/O Horizontal Exit(s)	Horizontal Exit(s)	
	−8	−2	0	1	5
11. Manual Fire Alarm	No Manual Fire Alarm		Manual Fire Alarm		
			W/O F.D. Conn.	W/ F.D. Conn.	
	−4		1	2	
12. Smoke Detection and Alarm	None	Corridor Only	Rooms Only	Corridor and Habit. Spaces	Total Spaces in Zone
	0(3)[g]	2(3)[g]	3(3)[g]	4	5
13. Automatic Sprinklers	None	Corridor and Habit. Space	Entire Building		
	0	8	10		

[a] Use (0) where Parameter 5 is −10.
[b] Use (0) where Parameter 10 is −8.
[c] Use (0) on floor with fewer than 31 patients (existing buildings only).
[d] Use (0) where Parameter 4 is −10.
[e] Use (0) where Parameter 1 is based on first floor zone or on an unprotected type of construction (columns marked "000" or "200").
[f] Use ( ) if the area of Class B or C interior finish in the corridor and exit or room is protected by automatic sprinklers and Parameter 13 is 0; use ( ) if the room with existing Class C interior finish is protected by automatic sprinklers, Parameter 4 is greater than or equal to 1, and Parameter 13 is 0.
[g] Use this value in addition to Parameter 13 if the entire zone is protected with quick-response automatic sprinklers.
[h] Use (0) where zone area ≤ 22,500 ft² and distance from any point to reach a door in smoke barrier ≤ 200 ft.

For SI units, 1 ft = 0.3048 m; 1 ft² = 0.092 m².

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 2 of 4)

Exhibit 3 continued

WORKSHEET 4.7.7 INDIVIDUAL SAFETY EVALUATIONS

Safety Parameters	Containment Safety (S_1)	Extinguishment Safety (S_2)	People Movement Safety (S_3)	General Safety (S_4)
1. Construction	0	0		0
2. Interior Finish (Corr. and Exit)	0		0	0
3. Interior Finish(Rooms)	3			3
4. Corridor Partitions/Walls	1			1
5. Doors to Corridor	1		1	1
6. Zone Dimensions			0	0
7. Vertical Openings	0		0	0
8. Hazardous Areas	−6	−6		−6
9. Smoke Control			0	0
10. Emergency Movement Routes			0	0
11. Manual Fire Alarm		2		2
12. Smoke Detection and Alarm		0	0	0
13. Automatic Sprinklers	10	10	10 ÷ 2 = 5	10
Total Value	S_1 = 9	S_2 = 6	S_3 = 6	S_4 = 9

WORKSHEET 4.7.8A MANDATORY SAFETY REQUIREMENTS — NEW HOSPITALS, EXISTING HOSPITALS, OR NEW NURSING HOMES

	Containment (S_a)		Extinguishment (S_b)		People Movement (S_c)	
Zone Location	**New**	**Exist.**	**New**	**Exist.**	**New**	**Exist.**
1st story	11	5	15(12)[a]	4	8(5)[a]	1
2nd or 3rd story[b]	15	9	17(14)[a]	6	10(7)[a]	3
4th story or higher but not high rise	18	9	19(16)[a]	6	11(8)[a]	3
High rise	18	17	19(16)[a]	16	11(8)[a]	7

[a] Use ( ) in zones that do not contain patient sleeping rooms.

[b] For a 2nd story zone location in a *sprinklered* EXISTING hospital, as an alternative to the mandatory safety requirement values set specified in the table, the following mandatory values set shall be permitted to be used: $S_a = 7$, $S_b = 10$, and $S_c = 7$.

WORKSHEET 4.7.8B MANDATORY SAFETY REQUIREMENTS — EXISTING NURSING HOMES

Zone Location	Containment (S_a)	Extinguishment (S_b)	People Movement (S_c)
1st story	0	10	0
2nd story	2	10	2
3rd story	6	14	2
4th story or higher	8	16	2

WORKSHEET 4.7.8C MANDATORY SAFETY REQUIREMENTS — MAJOR REHABILITATION IN NONSPRINKLERED EXISTING HOSPITALS

Zone Location	Containment (S_a)	Extinguishment (S_b)	People Movement (S_c)
1st story	13	17(14)*	8(5)*
2nd or 3rd story	17	19(16)*	10(7)*
4th story or higher	18	19(16)*	11(8)*

*Use ( ) in zones that do not contain patient sleeping rooms.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

Exhibit 3 continued

WORKSHEET 4.7.9 ZONE FIRE SAFETY EQUIVALENCY EVALUATION

									Yes	No
Containment Safety (S_1)	minus	Mandatory Containment (S_a)	≥	0	S_1 9	– S_a 11	= C −2			✗
Extinguishment Safety (S_2)	minus	Mandatory Extinguishment (S_b)	≥	0	S_2 6	– S_b 6	= E 0		✓	
People Movement Safety (S_3)	minus	Mandatory People Movement (S_c)	≥	0	S_3 6	– S_c 6	= P 0		✓	
General Safety (S_4)	minus	Occupancy Risk (R)	≥	0	S_4 9	– R 10.9	= G −1.9			✗

WORKSHEET 4.7.10 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

Complete one copy of this worksheet for each facility.
For each consideration, select and mark the appropriate column.

		Met	Not Met	Not Applic.
A.	Building utilities conform to the requirements of Section 9.1.	✓		☒
B.	In new facilities only, life-support systems, alarms, emergency communication systems, and illumination of generator set locations are powered as prescribed by 18.5.1.2 and 18.5.1.3.	✓		
C.	Heating and air conditioning systems conform with the air conditioning, heating, and ventilating systems requirements within Section 9.2, except for enclosure of vertical openings, which have been considered in Safety Parameter 7 of Worksheet 4.7.6.	✓		☒
D.	Fuel-burning space heaters and portable electrical space heaters are not used.	✓		☒
E.	There are no flue-fed incinerators.	✓		
F.	An evacuation plan is provided and fire drills conducted in accordance with 18.7.1/18.7.2 and 19.7.1/19.7.2.	✓		☒
G.	Smoking regulations have been adopted and implemented in accordance with 18.7.4 and 19.7.4.	✓		☒
H.	Combustibility of draperies, upholstered furniture, mattresses, furnishings, and decorations is limited in accordance with 18.7.5 and 19.7.5.	✓		
I.	Fire extinguishers are provided in accordance with the requirements of 18.3.5.12 and 19.3.5.12.	✓		☒
J.	Exit signs are provided in accordance with the requirements of 18.2.10.1 and 19.2.10.	✓		
K.	Emergency lighting is provided in accordance with 18.2.9.1 or 19.2.9.1.	✓		
L.	Standpipes are provided in all new high-rise buildings as required by 18.4.2.			✓

All references are to NFPA *101*, *Life Safety Code.*

WORKSHEET 4.7.11 CONCLUSIONS

1. ☐ All of the checks in Worksheet 4.7.9 are in the "Yes" column and all applicable considerations in Worksheet 4.7.10 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

2. ☐ All of the checks in Worksheet 4.7.9 are in the "Yes" column and all considerations identified in Worksheet 4.7.10 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

3. ☒ One or more of the checks in Worksheet 4.7.9 are in the "No" column or any consideration identified in Worksheet 4.7.10 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

Exhibit 3 continued

Run No. 2 — Hazardous Area Protected

Exhibit 4 presents the completed worksheets — Worksheet 4.7.1 through Worksheet 4.7.11 — using the FSES to re-evaluate the Oncology Services Building evaluated in the initial run, but with the 200 ft^2 (18.6 m^2) clean utility (storage) room protected as required of new hazardous areas by 18.3.2.1 of NFPA *101*. The walls are extended to contact the roof deck above and are upgraded so as to have a 1-hour fire resistance rating. The room door is replaced with a ¾-hour fire protection–rated door assembly.

The worksheets differ from those in the initial run as follows:

1. In Worksheet 4.7.6, Safety Parameter 8, "Hazardous Areas," the scored value is upgraded from -6 to 0 to represent that no deficiencies exist.
2. In Worksheet 4.7.7, Safety Parameter 8, "Hazardous Areas," the score of 0 replaces the -6 from the initial run, and the total safety values, S_1, S_2, and S_4, are recalculated. Note that the hazardous area consideration has no effect on People Movement Safety (S_3), as that cell of the table is X-ed out.
3. In Worksheet 4.7.9, the recalculated values for S_1, S_2, and S_4 replace those of the initial run. The indicated mathematics is performed to arrive at new values for *C, E,* and *G*. Note that all four equivalency evaluation categories have values of 0 or greater. Four check marks are made in the *Yes* column.
4. In Worksheet 4.7.11, conclusion number 1 is checked, as all the checks in Worksheet 4.7.9 are in the *Yes* column and all applicable considerations in Worksheet 4.7.10 are identified as *Met*. The level of fire safety is at least equivalent to that prescribed by NFPA *101* for health care occupancies.

WORKSHEET 4.7.1 COVER SHEET

Fire/Smoke Zone* Evaluation Worksheet for Health Care Facilities

Facility City Hospital Building Oncology Services
Zone(s) evaluated Floor 1 – Run no.2 – Hazardous area protected
Evaluator Ron Cote' Date 2/2/2013

Complete this worksheet for each zone. Where conditions are the same in several zones, one worksheet can be used for those zones.

*Fire/smoke zone is a space separated from all other spaces by floors, horizontal exits, or smoke barriers.

WORKSHEET 4.7.2 OCCUPANCY RISK PARAMETER FACTORS

Risk Parameters	Risk Factor Values					
1. Patient Mobility (*M*)	Mobility Status	Mobile	Limited Mobility	Not Mobile	Not Movable	
	Risk Factor	1.0	1.6	3.2	(4.5)	
2. Patient Density (*D*)	No. of Patients	1–5	6–10	11–30	>30	
	Risk Factor	1.0	1.2	1.5	(2.0)	
3. Zone Location (*L*)	Floor	1st	2nd or 3rd	4th to 6th	7th and Above	Basements
	Risk Factor	(1.1)	1.2	1.4	1.6	1.6
4. Ratio of Patients to Attendants (*T*)	Patients / Attendant	1–2 / 1	3–5 / 1	6–10 / 1	>10 / 1	One or More* / None
	Risk Factor	1.0	(1.1)	1.2	1.5	4.0
5. Patient Average Age (*A*)	Age	<65 Years and >1 Year		≥65 Years or ≤1 Year		
	Risk Factor	(1.0)		1.2		

*A risk factor of 4.0 is charged to any zone that houses patients without any staff in immediate attendance.

WORKSHEET 4.7.3 OCCUPANCY RISK FACTOR CALCULATION

	M		*D*		*L*		*T*		*A*		*F*
Occupancy Risk	4.5	×	2.0	×	1.1	×	1.1	×	1.0	=	10.9

WORKSHEET 4.7.4 ADJUSTED OCCUPANCY RISK FACTOR — NEW BUILDINGS

	F		*R*
1.0 ×	10.9	=	10.9

WORKSHEET 4.7.5 ADJUSTED OCCUPANCY RISK FACTOR — EXISTING BUILDINGS

	F		*R*
0.6 ×		=	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 4 Worksheets for Run No. 2 of FSES.

WORKSHEET 4.7.6 SAFETY PARAMETER VALUES

Safety Parameters	Parameter Values						
1. Construction	Combustible Types III, IV, and V				Noncombustible Types I and II		
Floor or Zone	000	111	200	211, 2HH	000	111	222, 322, 442
First	−2	0	−2	0	0	2	2
Second	−7	−2	−4	−2	−2	2	4
Third	−9	−7	−9	−7	−7	2	4
4th and Above	−13	−7	−13	−7	−9	−7	4

2. Interior Finish (Corridors and Exits)	Class C	Class B	Class A		
	−5(0)[f]	0(3)[f]	3		
3. Interior Finish (Rooms)	Class C	Class B	Class A		
	−3(1)[f]	1(3)[f]	3		
4. Corridor Partitions/Walls	None or Incomplete	<½ hr	≥½ hr to <1 hr	≥1 hr	
	−10(0)[a]	0	1(0)[a]	2(0)[a]	
5. Doors to Corridor	No Door	<20 min FPR	≥20 min FPR	≥20 min FPR and Auto Clos.	
	−10	0	1(0)[d]	2(0)[d]	

6. Zone Dimensions	Dead End			No Dead Ends >30 ft and Zone Length Is		
	>100 ft	>50 ft to 100 ft	30 ft to 50 ft	>150 ft	100 ft to 150 ft	<100 ft
	−6(0)[b]	−4(0)[b]	−2(0)[b]	−2(0)[c](0)[h]	0(0)[h]	1

7. Vertical Openings	Open 4 or More Floors	Open 2 or 3 Floors	Enclosed with Indicated Fire Resist.		
			<1 hr	≥1 hr to <2 hr	≥2 hr
	−14	−10	0	2(0)[e]	3(0)[e]

8. Hazardous Areas	Double Deficiency		Single Deficiency		No Deficiencies
	In Zone	Outside Zone	In Zone	In Adjacent Zone	
	−11	−5	−6	−2	0

9. Smoke Control	No Control	Smoke Barrier Serves Zone	Mech. Assisted Systems by Zone	
	−5(0)[c]	0	3	

10. Emergency Movement Routes	<2 Routes	Multiple Routes			Direct Exit(s)
		Deficient	W/O Horizontal Exit(s)	Horizontal Exit(s)	
	−8	−2	0	1	5

11. Manual Fire Alarm	No Manual Fire Alarm	Manual Fire Alarm	
		W/O F.D. Conn.	W/ F.D. Conn.
	−4	1	2

12. Smoke Detection and Alarm	None	Corridor Only	Rooms Only	Corridor and Habit. Spaces	Total Spaces in Zone
	0(3)[g]	2(3)[g]	3(3)[g]	4	5

13. Automatic Sprinklers	None	Corridor and Habit. Space	Entire Building		
	0	8	10		

[a] Use (0) where Parameter 5 is −10.
[b] Use (0) where Parameter 10 is −8.
[c] Use (0) on floor with fewer than 31 patients (existing buildings only).
[d] Use (0) where Parameter 4 is −10.
[e] Use (0) where Parameter 1 is based on first floor zone or on an unprotected type of construction (columns marked "000" or "200").
[f] Use ( ) if the area of Class B or C interior finish in the corridor and exit or room is protected by automatic sprinklers and Parameter 13 is 0; use ( ) if the room with existing Class C interior finish is protected by automatic sprinklers, Parameter 4 is greater than or equal to 1, and Parameter 13 is 0.
[g] Use this value in addition to Parameter 13 if the entire zone is protected with quick-response automatic sprinklers.
[h] Use (0) where zone area ≤ 22,500 ft² and distance from any point to reach a door in smoke barrier ≤ 200 ft.

For SI units, 1 ft = 0.3048 m; 1 ft² = 0.092 m².

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 2 of 4)

Exhibit 4 continued

WORKSHEET 4.7.7 INDIVIDUAL SAFETY EVALUATIONS

Safety Parameters	Containment Safety (S_1)	Extinguishment Safety (S_2)	People Movement Safety (S_3)	General Safety (S_4)
1. Construction	0	0		0
2. Interior Finish (Corr. and Exit)	0			0
3. Interior Finish(Rooms)	3			3
4. Corridor Partitions/Walls	1			1
5. Doors to Corridor	1		1	1
6. Zone Dimensions				
7. Vertical Openings	0		0	0
8. Hazardous Areas	0	0		0
9. Smoke Control			0	0
10. Emergency Movement Routes			0	0
11. Manual Fire Alarm		2		2
12. Smoke Detection and Alarm		0	0	0
13. Automatic Sprinklers	10	10	10 ÷ 2 = 5	10
Total Value	S_1 = 15	S_2 = 12	S_3 = 6	S_4 = 15

WORKSHEET 4.7.8A MANDATORY SAFETY REQUIREMENTS — NEW HOSPITALS, EXISTING HOSPITALS, OR NEW NURSING HOMES

	Containment (S_a)		Extinguishment (S_b)		People Movement (S_c)	
Zone Location	**New**	**Exist.**	**New**	**Exist.**	**New**	**Exist.**
1st story	11	5	15(12)[a]	4	8(5)[a]	1
2nd or 3rd story[b]	15	9	17(14)[a]	6	10(7)[a]	3
4th story or higher but not high rise	18	9	19(16)[a]	6	11(8)[a]	3
High rise	18	17	19(16)[a]	16	11(8)[a]	7

[a] Use ( ) in zones that do not contain patient sleeping rooms.

[b] For a 2nd story zone location in a *sprinklered* EXISTING hospital, as an alternative to the mandatory safety requirement values set specified in the table, the following mandatory values set shall be permitted to be used: $S_a = 7$, $S_b = 10$, and $S_c = 7$.

WORKSHEET 4.7.8B MANDATORY SAFETY REQUIREMENTS — EXISTING NURSING HOMES

Zone Location	Containment (S_a)	Extinguishment (S_b)	People Movement (S_c)
1st story	0	10	0
2nd story	2	10	2
3rd story	6	14	2
4th story or higher	8	16	2

WORKSHEET 4.7.8C MANDATORY SAFETY REQUIREMENTS — MAJOR REHABILITATION IN NONSPRINKLERED EXISTING HOSPITALS

Zone Location	Containment (S_a)	Extinguishment (S_b)	People Movement (S_c)
1st story	13	17(14)*	8(5)*
2nd or 3rd story	17	19(16)*	10(7)*
4th story or higher	18	19(16)*	11(8)*

*Use ( ) in zones that do not contain patient sleeping rooms.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

Exhibit 4 continued

WORKSHEET 4.7.9 ZONE FIRE SAFETY EQUIVALENCY EVALUATION

					S_1		S_a		C	Yes	No
Containment Safety (S_1)	minus	Mandatory Containment (S_a)	≥	0	15	–	11	=	4	✓	
					S_2		S_b		E		
Extinguishment Safety (S_2)	minus	Mandatory Extinguishment (S_b)	≥	0	12	–	6	=	6	✓	
					S_3		S_c		P		
People Movement Safety (S_3)	minus	Mandatory People Movement (S_c)	≥	0	6	–	6	=	0	✓	
					S_4		R		G		
General Safety (S_4)	minus	Occupancy Risk (R)	≥	0	15	–	10.9	=	4.1	✓	

WORKSHEET 4.7.10 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

Complete one copy of this worksheet for each facility.
For each consideration, select and mark the appropriate column.

		Met	Not Met	Not Applic.
A.	Building utilities conform to the requirements of Section 9.1.	✓		☒
B.	In new facilities only, life-support systems, alarms, emergency communication systems, and illumination of generator set locations are powered as prescribed by 18.5.1.2 and 18.5.1.3.	✓		
C.	Heating and air conditioning systems conform with the air conditioning, heating, and ventilating systems requirements within Section 9.2, except for enclosure of vertical openings, which have been considered in Safety Parameter 7 of Worksheet 4.7.6.	✓		☒
D.	Fuel-burning space heaters and portable electrical space heaters are not used.	✓		☒
E.	There are no flue-fed incinerators.	✓		
F.	An evacuation plan is provided and fire drills conducted in accordance with 18.7.1/18.7.2 and 19.7.1/19.7.2.	✓		☒
G.	Smoking regulations have been adopted and implemented in accordance with 18.7.4 and 19.7.4.	✓		☒
H.	Combustibility of draperies, upholstered furniture, mattresses, furnishings, and decorations is limited in accordance with 18.7.5 and 19.7.5.	✓		
I.	Fire extinguishers are provided in accordance with the requirements of 18.3.5.12 and 19.3.5.12.	✓		☒
J.	Exit signs are provided in accordance with the requirements of 18.2.10.1 and 19.2.10.	✓		
K.	Emergency lighting is provided in accordance with 18.2.9.1 or 19.2.9.1.	✓		
L.	Standpipes are provided in all new high-rise buildings as required by 18.4.2.			✓

All references are to NFPA *101, Life Safety Code.*

WORKSHEET 4.7.11 CONCLUSIONS

1. ☑ All of the checks in Worksheet 4.7.9 are in the "Yes" column and all applicable considerations in Worksheet 4.7.10 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

2. ☐ All of the checks in Worksheet 4.7.9 are in the "Yes" column and all considerations identified in Worksheet 4.7.10 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

3. ☐ One or more of the checks in Worksheet 4.7.9 are in the "No" column or any consideration identified in Worksheet 4.7.10 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

Exhibit 4 continued

Run No. 3 — Corridor Interior Wall Finish Upgraded

Exhibit 5 presents the completed worksheets — Worksheet 4.7.1 through Worksheet 4.7.11 — using the FSES to re-evaluate the Oncology Services Building evaluated in the initial run, but with the corridor interior wall finish upgraded to Class A materials. The protective plastic panels that covered the lower 4 ft (1.2 m) of the corridor walls are removed, leaving painted concrete block. The deficiency relative to the clean utility (storage) room — as evaluated in the initial run and corrected in Run No. 2 — remains a deficiency. In this run, Run No. 3, the FSES is used to evaluate whether the corridor wall finish upgrade can offset the hazardous area protection deficiency.

The worksheets differ from those in the initial run as follows:

1. In Worksheet 4.7.6, Safety Parameter 2, "Interior Finish (Corridors and Exits)," the scored value is upgraded from 0 to 3 to represent the presence of Class A interior wall finish materials.
2. In Worksheet 4.7.7, Safety Parameter 2, "Interior Finish (Corridors and Exits)," the score of 3 replaces the 0 from the initial run, and the total safety values, S_1, S_3, and S_4, are recalculated. Note that the interior finish consideration has no effect on Extinguishment Safety (S_2), as that cell of the table is X-ed out.
3. In Worksheet 4.7.9, the recalculated values for S_1, S_3, and S_4 replace those of the initial run. The indicated mathematics is performed to arrive at new values for *C, P,* and *G*. Note that all four equivalency evaluation categories have values of 0 or greater. Four check marks are made in the *Yes* column.
4. In Worksheet 4.7.11, conclusion number 1 is checked, as all the checks in Worksheet 4.7.9 are in the *Yes* column and all applicable considerations in Worksheet 4.7.10 are identified as *Met*. The level of fire safety is at least equivalent to that prescribed by NFPA *101* for health care occupancies.

WORKSHEET 4.7.1 COVER SHEET

Fire/Smoke Zone* Evaluation Worksheet for Health Care Facilities

Facility City Hospital Building Oncology Services
Zone(s) evaluated Floor 1 – Run no.3 – Corridor interior finish upgraded
Evaluator Ron Cote Date 2/3/2013

Complete this worksheet for each zone. Where conditions are the same in several zones, one worksheet can be used for those zones.

*Fire/smoke zone is a space separated from all other spaces by floors, horizontal exits, or smoke barriers.

WORKSHEET 4.7.2 OCCUPANCY RISK PARAMETER FACTORS

Risk Parameters	Risk Factor Values					
1. Patient Mobility (*M*)	Mobility Status	Mobile	Limited Mobility	Not Mobile	Not Movable	
	Risk Factor	1.0	1.6	3.2	(4.5)	
2. Patient Density (*D*)	No. of Patients	1–5	6–10	11–30	>30	
	Risk Factor	1.0	1.2	1.5	(2.0)	
3. Zone Location (*L*)	Floor	1st	2nd or 3rd	4th to 6th	7th and Above	Basements
	Risk Factor	(1.1)	1.2	1.4	1.6	1.6
4. Ratio of Patients to Attendants (*T*)	Patients / Attendant	1–2 / 1	3–5 / 1	6–10 / 1	>10 / 1	One or More* / None
	Risk Factor	1.0	(1.1)	1.2	1.5	4.0
5. Patient Average Age (*A*)	Age	<65 Years and >1 Year		≥65 Years or ≤1 Year		
	Risk Factor	(1.0)		1.2		

*A risk factor of 4.0 is charged to any zone that houses patients without any staff in immediate attendance.

WORKSHEET 4.7.3 OCCUPANCY RISK FACTOR CALCULATION

	M		*D*		*L*		*T*		*A*		*F*
Occupancy Risk	[4.5]	×	[2.0]	×	[1.1]	×	[1.1]	×	[1.0]	=	[10.9]

WORKSHEET 4.7.4 ADJUSTED OCCUPANCY RISK FACTOR — NEW BUILDINGS

	F		*R*
1.0 ×	[10.9]	=	[10.9]

WORKSHEET 4.7.5 ADJUSTED OCCUPANCY RISK FACTOR — EXISTING BUILDINGS

	F		*R*
0.6 ×	[ ]	=	[ ]

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 5 Worksheets for Run No. 3 of FSES.

WORKSHEET 4.7.6 SAFETY PARAMETER VALUES

Safety Parameters	Parameter Values						
1. Construction	Combustible Types III, IV, and V				Noncombustible Types I and II		
Floor or Zone	000	111	200	211, 2HH	000	111	222, 322, 442
First	−2	0	−2	0	0	2	2
Second	−7	−2	−4	−2	−2	2	4
Third	−9	−7	−9	−7	−7	2	4
4th and Above	−13	−7	−13	−7	−9	−7	4
2. Interior Finish (Corridors and Exits)	Class C	Class B	Class A				
	−5(0)[f]	0(3)[f]	3				
3. Interior Finish (Rooms)	Class C	Class B	Class A				
	−3(1)[f]	1(3)[f]	3				
4. Corridor Partitions/Walls	None or Incomplete	<½ hr	≥½ hr to <1 hr	≥1 hr			
	−10(0)[a]	0	1(0)[a]	2(0)[a]			
5. Doors to Corridor	No Door	<20 min FPR	≥20 min FPR	≥20 min FPR and Auto Clos.			
	−10	0	1(0)[d]	2(0)[d]			
6. Zone Dimensions	Dead End			No Dead Ends >30 ft and Zone Length Is			
	>100 ft	>50 ft to 100 ft	30 ft to 50 ft	>150 ft	100 ft to 150 ft	<100 ft	
	−6(0)[b]	−4(0)[b]	−2(0)[b]	−2(0)[c](0)[h]	0(0)[h]	1	
7. Vertical Openings	Open 4 or More Floors	Open 2 or 3 Floors	Enclosed with Indicated Fire Resist.				
			<1 hr	≥1 hr to <2 hr	≥2 hr		
	−14	−10	0	2(0)[e]	3(0)[e]		
8. Hazardous Areas	Double Deficiency		Single Deficiency		No Deficiencies		
	In Zone	Outside Zone	In Zone	In Adjacent Zone			
	−11	−5	−6	−2	0		
9. Smoke Control	No Control	Smoke Barrier Serves Zone	Mech. Assisted Systems by Zone				
	−5(0)[c]	0	3				
10. Emergency Movement Routes	<2 Routes	Multiple Routes			Direct Exit(s)		
		Deficient	W/O Horizontal Exit(s)	Horizontal Exit(s)			
	−8	−2	0	1	5		
11. Manual Fire Alarm	No Manual Fire Alarm	Manual Fire Alarm					
	−4	W/O F.D. Conn.	W/ F.D. Conn.				
		1	2				
12. Smoke Detection and Alarm	None	Corridor Only	Rooms Only	Corridor and Habit. Spaces	Total Spaces in Zone		
	0(3)[g]	2(3)[g]	3(3)[g]	4	5		
13. Automatic Sprinklers	None	Corridor and Habit. Space	Entire Building				
	0	8	10				

[a] Use (0) where Parameter 5 is −10.
[b] Use (0) where Parameter 10 is −8.
[c] Use (0) on floor with fewer than 31 patients (existing buildings only).
[d] Use (0) where Parameter 4 is −10.
[e] Use (0) where Parameter 1 is based on first floor zone or on an unprotected type of construction (columns marked "000" or "200").
[f] Use ( ) if the area of Class B or C interior finish in the corridor and exit or room is protected by automatic sprinklers and Parameter 13 is 0; use ( ) if the room with existing Class C interior finish is protected by automatic sprinklers, Parameter 4 is greater than or equal to 1, and Parameter 13 is 0.
[g] Use this value in addition to Parameter 13 if the entire zone is protected with quick-response automatic sprinklers.
[h] Use (0) where zone area ≤ 22,500 ft² and distance from any point to reach a door in smoke barrier ≤ 200 ft.

For SI units, 1 ft = 0.3048 m; 1 ft² = 0.092 m².

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 2 of 4)

Exhibit 5 continued

WORKSHEET 4.7.7 INDIVIDUAL SAFETY EVALUATIONS

Safety Parameters	Containment Safety (S_1)	Extinguishment Safety (S_2)	People Movement Safety (S_3)	General Safety (S_4)
1. Construction	0	0		0
2. Interior Finish (Corr. and Exit)	3		3	3
3. Interior Finish(Rooms)	3			3
4. Corridor Partitions/Walls	1			1
5. Doors to Corridor	1		1	1
6. Zone Dimensions			0	0
7. Vertical Openings	0		0	0
8. Hazardous Areas	−6	−6		−6
9. Smoke Control			0	0
10. Emergency Movement Routes			0	0
11. Manual Fire Alarm		2		2
12. Smoke Detection and Alarm		0	0	0
13. Automatic Sprinklers	10	10	10 ÷ 2 = 5	10
Total Value	S_1 = 12	S_2 = 6	S_3 = 9	S_4 = 14

WORKSHEET 4.7.8A MANDATORY SAFETY REQUIREMENTS — NEW HOSPITALS, EXISTING HOSPITALS, OR NEW NURSING HOMES

	Containment (S_a)		Extinguishment (S_b)		People Movement (S_c)	
Zone Location	**New**	**Exist.**	**New**	**Exist.**	**New**	**Exist.**
1st story	11	5	15(12)[a]	4	8(5)[a]	1
2nd or 3rd story[b]	15	9	17(14)[a]	6	10(7)[a]	3
4th story or higher but not high rise	18	9	19(16)[a]	6	11(8)[a]	3
High rise	18	17	19(16)[a]	16	11(8)[a]	7

[a] Use ( ) in zones that do not contain patient sleeping rooms.

[b] For a 2nd story zone location in a *sprinklered* EXISTING hospital, as an alternative to the mandatory safety requirement values set specified in the table, the following mandatory values set shall be permitted to be used: $S_a = 7$, $S_b = 10$, and $S_c = 7$.

WORKSHEET 4.7.8B MANDATORY SAFETY REQUIREMENTS — EXISTING NURSING HOMES

Zone Location	Containment (S_a)	Extinguishment (S_b)	People Movement (S_c)
1st story	0	10	0
2nd story	2	10	2
3rd story	6	14	2
4th story or higher	8	16	2

WORKSHEET 4.7.8C MANDATORY SAFETY REQUIREMENTS — MAJOR REHABILITATION IN NONSPRINKLERED EXISTING HOSPITALS

Zone Location	Containment (S_a)	Extinguishment (S_b)	People Movement (S_c)
1st story	13	17(14)*	8(5)*
2nd or 3rd story	17	19(16)*	10(7)*
4th story or higher	18	19(16)*	11(8)*

*Use ( ) in zones that do not contain patient sleeping rooms.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

Exhibit 5 continued

WORKSHEET 4.7.9 ZONE FIRE SAFETY EQUIVALENCY EVALUATION

					S_1		S_a		C	Yes	No
Containment Safety (S_1)	minus	Mandatory Containment (S_a)	≥	0	12	–	11	=	1	✓	
					S_2		S_b		E		
Extinguishment Safety (S_2)	minus	Mandatory Extinguishment (S_b)	≥	0	6	–	6	=	0	✓	
					S_3		S_c		P		
People Movement Safety (S_3)	minus	Mandatory People Movement (S_c)	≥	0	9	–	6	=	3	✓	
					S_4		R		G		
General Safety (S_4)	minus	Occupancy Risk (R)	≥	0	14	–	10.9	=	3.1	✓	

WORKSHEET 4.7.10 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

Complete one copy of this worksheet for each facility.
For each consideration, select and mark the appropriate column.

		Met	Not Met	Not Applic.
A.	Building utilities conform to the requirements of Section 9.1.	✓		☒
B.	In new facilities only, life-support systems, alarms, emergency communication systems, and illumination of generator set locations are powered as prescribed by 18.5.1.2 and 18.5.1.3.	✓		
C.	Heating and air conditioning systems conform with the air conditioning, heating, and ventilating systems requirements within Section 9.2, except for enclosure of vertical openings, which have been considered in Safety Parameter 7 of Worksheet 4.7.6.	✓		☒
D.	Fuel-burning space heaters and portable electrical space heaters are not used.	✓		☒
E.	There are no flue-fed incinerators.	✓		
F.	An evacuation plan is provided and fire drills conducted in accordance with 18.7.1/18.7.2 and 19.7.1/19.7.2.	✓		☒
G.	Smoking regulations have been adopted and implemented in accordance with 18.7.4 and 19.7.4.	✓		☒
H.	Combustibility of draperies, upholstered furniture, mattresses, furnishings, and decorations is limited in accordance with 18.7.5 and 19.7.5.	✓		
I.	Fire extinguishers are provided in accordance with the requirements of 18.3.5.12 and 19.3.5.12.	✓		☒
J.	Exit signs are provided in accordance with the requirements of 18.2.10.1 and 19.2.10.	✓		
K.	Emergency lighting is provided in accordance with 18.2.9.1 or 19.2.9.1.	✓		
L.	Standpipes are provided in all new high-rise buildings as required by 18.4.2.			✓

All references are to NFPA *101*, *Life Safety Code*.

WORKSHEET 4.7.11 CONCLUSIONS

1. ☑ All of the checks in Worksheet 4.7.9 are in the "Yes" column and all applicable considerations in Worksheet 4.7.10 are identified as "Met". The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

2. ☐ All of the checks in Worksheet 4.7.9 are in the "Yes" column and all considerations identified in Worksheet 4.7.10 as "Not Met" have been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is at least equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

3. ☐ One or more of the checks in Worksheet 4.7.9 are in the "No" column or any consideration identified in Worksheet 4.7.10 as "Not Met" has NOT been evaluated and mitigated to the satisfaction of the AHJ. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA 101, *Life Safety Code*, for health care occupancies.

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

Exhibit 5 continued

Chapter 5

Chapter 5 presents the second of five fire safety evaluation systems (FSESs). Each FSES applies to a specific occupancy. Each FSES provides a formalized method or tool for measuring the level of life safety against that required by NFPA *101*-2012, *Life Safety Code,* for use in an equivalency submittal to the authority having jurisdiction (AHJ).

Chapter 5 applies only to detention and correctional occupancies as addressed in NFPA *101* Chapter 22, New Detention and Correctional Occupancies, and Chapter 23, Existing Detention and Correctional Occupancies. The provisions of Chapter 22 and Chapter 23 focus mainly on life safety requirements for the residential portions of detention and correctional occupancies.

5.1.1

NFPA 101A is unique in that, although it is a guide, the chapters presenting FSES utilize the word *shall*. The context in which the detention and correctional occupancies FSES is written in mandatory language is explained in the second sentence of 5.1.1.

5.1.2

NFPA *101* applies both to new construction and to existing buildings. Where a new detention and correctional occupancy is compliant with the requirements of NFPA *101* Chapter 22 for new detention and correctional occupancies, there is no need to utilize NFPA 101A Chapter 5. Similarly, where an existing detention and correctional occupancy is compliant with the requirements of NFPA *101* Chapter 23 for existing detention and correctional occupancies, there is no need to utilize NFPA 101A Chapter 5. The user of NFPA *101* Chapter 22 or 23 might employ NFPA 101A where the facility is not compliant with the requirements of the applicable chapters of NFPA *101* and an equivalency submittal is to be prepared for submittal to the AHJ.

NFPA 101A presents a formalized method for preparing an equivalency submittal, for detention and correctional occupancies, in accordance with the equivalency concept permitted by NFPA *101* Section 1.4, which reads as follows:

> **1.4* Equivalency.** Nothing in this *Code* is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this *Code*.
>
> **1.4.1 Technical Documentation.** Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.
>
> **1.4.2 Approval.** The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.
>
> **1.4.3* Equivalent Compliance.** Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this *Code*.

Once the AHJ approves an NFPA 101A equivalency submittal as providing a facility with life safety that, *in toto*, is equivalent to that provided by compliance with all applicable provisions of NFPA *101*, such facility is deemed to comply with NFPA *101* as stated above in the text from NFPA *101* 1.4.3. However, such equivalency is relative to compliance with the provisions of a specific edition of NFPA *101*. Where a jurisdiction adopts a newer edition of NFPA *101*, the equivalency submittal will need to be conducted anew, utilizing the applicable editions of NFPA *101* and NFPA 101A. For example, in a jurisdiction that enforces the 2000 edition of NFPA *101*, an equivalency submittal is prepared using the 2001 edition of NFPA 101A. The jurisdiction then updates to the 2012 edition of NFPA *101*, and a new equivalency submittal is prepared using the 2013 edition of NFPA 101A.

As an example of the case cited in the previous paragraph, at the time a detention and correctional occupancy equivalency submittal was prepared for an existing correctional institution per NFPA 101A-2001, the correctional institution was subject to the requirements of NFPA *101*-2000 for an existing detention and correctional occupancy. The NFPA 101A FSES mandatory values used for the correctional institution were those applicable to existing correctional institutions. In 2013 the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used for the existing correctional institution are those applicable to existing detention and correctional

occupancies. The new equivalency submittal reflects that the NFPA *101* requirements applicable to existing detention and correctional occupancies might have changed between the 2000 and 2012 editions.

As another example, at the time a detention and correctional occupancy equivalency submittal was prepared for a correctional facility per NFPA 101A-2001, the correctional facility was new and subject to the requirements of NFPA *101*-2000 for a new detention and correctional occupancy. The NFPA 101A FSES mandatory values used for the correctional facility were those applicable to new detention and correctional occupancies. In 2013 the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used, for what has become an existing correctional facility, are those applicable to existing detention and correctional occupancies. Some might argue that the correctional occupancy is being held to a lesser level of scrutiny, given that it is to be evaluated via the provisions applicable to existing buildings, which typically are less stringent than those applied to new construction. They are concerned that the new equivalency submittal, based on the mandatory values of NFPA 101A applicable to existing detention and correctional occupancies, will permit life safety features to go unrecognized that were abandoned, or not otherwise maintained, in the years between equivalency submittals. Given that NFPA *101* and NFPA 101A are to be used together, such situation is avoided because the AHJ will enforce the following provision of NFPA *101*-2012:

> **5.6.12.2** No existing life safety feature shall be removed or reduced where such feature is a requirement for new construction.

5.2

The FSES is more than the forms presented in Worksheet 5.5.1 through Worksheet 5.5.8. The four pages of forms are supplemented by five pages of text detailing, mainly, the considerations requiring attention for purposes of completing Worksheet 5.5.3 related to safety parameter values. In addition to the forms and detailed text of 5.2 through 5.5.8, the NFPA 101A user needs a well-based foundation in the use of NFPA *101* Chapters 22 and 23, and related core Chapters 1 through 11. **Note that persons without experience in the use of NFPA *101* should not attempt an equivalency submittal preparation using NFPA 101A.** Each equivalency submittal needs to be evaluated, via careful scrutiny of the AHJ, with due consideration of the preparer's credentials.

The provisions of Section 5.2 direct the user to evaluate the entire facility on a single worksheet unless different use conditions or fire protection features are provided and there is minimum 2-hr fire resistance–rated separation between such areas. The direction is different from that provided in the health care occupancies FSES of Chapter 4, where zones are identified and each zone is evaluated separately.

5.3

The provision of Section 5.3 makes clear that the presence of a building feature or system does not, by itself, provide positive credit in the evaluation. Such feature or system needs to be maintained in order to receive credit contributing toward the equivalency. For example, where a manual fire alarm system without emergency forces notification is present but not maintained, Safety Parameter 3 of Worksheet 5.5.3 would be scored with a value of -1, rather than a value of 0.

5.4.1

The text associated with scoring Safety Parameter 1, "Construction," of Worksheet 5.5.3 appears in 5.4.1 through 5.4.1.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 1, is reflected in the third position of the related text paragraph numbers, in this case 5.4.1. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

To score Safety Parameter 1, "Construction," of Worksheet 5.5.3, the user needs to be familiar with the building construction type notations as used in NFPA *101* 22.1.6 and 23.1.6 and explained further in NFPA *101* Table A.8.2.1.2.

5.4.1.1

The provision of 5.4.1.1 is consistent in concept with that expressed in NFPA *101* 8.2.1.3. The term *additions or connected structures* is meant to apply to sections of the building that sit side-by-side, and not the condition where floors of a given construction type are stacked atop floors of

a different construction type. NFPA *101* 8.2.1.3 clarifies the issue by referring to the separating barrier between the differing construction types as a vertically aligned fire barrier.

5.4.1.2

The provision of 5.4.1.2 applies the building construction type consideration based on the highest story used for confinement purposes. Where areas of the building are evaluated separately as permitted by Section 5.2 (i.e., where different use conditions or fire protection features are provided and there is minimum 2-hr fire resistance–rated separation between such areas), Safety Parameter 1 is scored to reflect the highest floor used for confinement purposes in the area of the building being evaluated. In the case of a four-story building, for example, where a separate evaluation area comprises only floor 1, Safety Parameter 1 is scored based on the values in the row labeled *1 story*.

Note *a* to Worksheet 5.5.3 tempers the negative scores applicable where resident confinement occurs on the third or higher story of combustible frame buildings (i.e., Type V, Type IV, or Type III construction) and unprotected steel-frame buildings [i.e., Type II(000) construction], if the building is fully sprinklered.

5.4.2

The text associated with scoring Safety Parameter 2, "Hazardous Areas," of Worksheet 5.5.3 appears in 5.4.2 through 5.4.2.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 2, is reflected in the third position of the related text paragraph numbers, in this case 5.4.2. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

5.4.2.1.1

The provision of 5.4.2.1.1 sends the user to NFPA *101* 22.3.2 and 23.3.2, which sends the user to Section 8.7 to determine hazardous areas. The concept is one of identifying spaces within a detention and correctional occupancy where the contents/uses present a greater hazard than that typically associated with spaces such as resident sleeping rooms. The areas and uses listed in NFPA *101* Table 22.3.2.1 and Table 23.3.2.1 constitute hazardous areas requiring protection.

5.4.2.1.2

Severe hazards are addressed in NFPA *101* 8.7.1.1(3) and include hazardous areas that are required to be separated from the remainder of the floor by minimum 1-hour fire resistance–rated barriers and protected by automatic sprinklers. The entries in NFPA *101* Table 22.3.2.1 for which the second column requires 1-hour separation are to be considered severe hazards for purposes of applying NFPA 101A Table 5.4.2.2, as all new detention and correctional occupancy buildings are required to be sprinklered in accordance with 22.3.5.2. Existing hazardous areas subject to the provisions of NFPA *101* Table 23.3.2.1 are to be considered not severe hazards for purposes of applying NFPA 101A Table 5.4.2.2, as Table 23.3.2.1 requires the existing hazardous areas to be separated from the remainder of the floor by minimum 1-hour fire resistance–rated barriers or protected by automatic sprinklers.

Note *b* to Worksheet 5.5.3 penalizes a double deficiency located outside the residential housing area in nonsprinklered, unprotected construction [i.e., Type II(000), Type III(200), and Type V(000) construction].

5.4.3

The text associated with scoring Safety Parameter 3, "Fire Alarm," of Worksheet 5.5.3 appears in 5.4.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 3, is reflected in the third position of the related text paragraph number, in this case 5.4.3. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The consideration related to Safety Parameter 3, "Fire Alarm," involves first determining whether a manual fire alarm system, as required and detailed by NFPA *101* 22.3.4 and 23.3.4, is provided. If such manual fire alarm system is provided, the user next needs to determine whether the fire alarm system is provided with fire department notification, as might be accomplished via an approved central station connection. See NFPA *101* 9.6.4.2.

5.4.4

The text associated with scoring Safety Parameter 4, "Smoke Detection," of Worksheet 5.5.3 appears in 5.4.4 through 5.4.4.2.5. The worksheet value should not be scored without consult-

ing the text portion of the document. Note that the safety parameter number, in this case 4, is reflected in the third position of the related text paragraph numbers, in this case 5.4.4. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Where smoke detection is not provided but the entire building is sprinklered so as to score a value of 10 in Safety Parameter 5, "Automatic Sprinklers," the -4 value for no smoke detection is tempered to a value of -1 as directed by Note *a* to Worksheet 5.5.3.

5.4.5

The text associated with scoring Safety Parameter 5, "Automatic Sprinklers," of Worksheet 5.5.3 appears in 5.4.5 through 5.4.5.1.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 5, is reflected in the third position of the related text paragraph numbers, in this case 5.4.5. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

5.4.6

The text associated with scoring Safety Parameter 6, "Interior Finish (Corridors and Egress)," of Worksheet 5.5.3 appears in 5.4.6 through 5.4.6.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 6, is reflected in the third position of the related text paragraph number, in this case 5.4.6. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note that the interior finish consideration, required for scoring Safety Parameter 6 of Worksheet 5.5.3, includes both interior wall finish and interior ceiling finish. Walls and ceilings are grouped into the category of *interior wall and ceiling finish* as used in NFPA *101* 10.2.3.

In scoring any safety parameter of Worksheet 5.7.6 it is paramount that the surveyor choose the value associated with what is present. This is particularly important relative to the interior finish safety value. NFPA *101* permits the required interior wall or ceiling classification to be reduced by one category due to the presence of automatic sprinkler protection (e.g., where the *Code* requires nothing inferior to Class B, the presence of sprinklers permits the use of Class C). If the surveyor sees existing Class C interior finish (i.e., flame spread index of between 76 and 200), the surveyor is to circle the safety parameter value for Class C regardless of the presence of sprinklers, not that for Class B. The FSES mandatory values (as addressed in Worksheet 5.5.5A through Worksheet 5.5.5C) are calibrated to provide credit for sprinklers without the surveyor taking credit for the presence of sprinklers relative to the scoring of Safety Parameter 6 and Safety Parameter 7. This prevents the surveyor from incorrectly taking a double credit.

5.4.7

The word "Reserved" is meant to connote that no text, in addition to that presented in 5.4.6, is needed for guidance on scoring Safety Parameter 7, "Interior Finish (Other Areas)," of Worksheet 5.5.3. The text of 5.4.6 addresses interior finish for corridors and egress as well as interior finish for other areas.

5.4.8

The text associated with scoring Safety Parameter 8, "Cell/Sleeping Room Enclosure," of Worksheet 5.5.3 appears in 5.4.8 through 5.4.8.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 8, is reflected in the third position of the related text paragraph numbers, in this case 5.4.8. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *c* to Worksheet 5.5.3 lowers the score by two points for a new Use Condition V – Contained facility (as detailed in NFPA *101* 22.1.2.1.5) that is not sprinklered.

Note *d* to Worksheet 5.5.3 raises the score by three points under a variety of mitigating conditions. The user needs to read Note *d* carefully to identify the different options.

5.4.9

The text associated with scoring Safety Parameter 9, "Separation of Residential Housing Area from Other Areas," of Worksheet 5.5.3 appears in 5.4.9 through 5.4.9.2.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 9, is reflected in the third position of the related text paragraph numbers, in this case 5.4.9. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *b* to Worksheet 5.5.3 penalizes the score for 1-hr or greater fire resistance–rated separation in nonsprinklered, unprotected construction [i.e., Type II(000), Type III(200), and Type V(000) construction].

Note *h* to Worksheet 5.5.3 raises the score by two points for new smoke-resistant separations with less than 1 hour of fire resistance rating in Use Conditions II through IV if the cells face the access corridor.

5.4.10

The text associated with scoring Safety Parameter 10, "Exit System," of Worksheet 5.5.3 appears in 5.4.10 through 5.4.10.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 10, is reflected in the third position of the related text paragraph numbers, in this case 5.4.10. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

5.4.11

The text associated with scoring Safety Parameter 11, "Exit Access," of Worksheet 5.5.3 appears in 5.4.11 through 5.4.11.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 11, is reflected in the third position of the related text paragraph numbers, in this case 5.4.11. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 11, "Exit Access," of Worksheet 5.5.3 is scored using a two-step approach. First, the user determines whether there are any dead-end corridors in excess of 50 ft (15 m), or 20 ft (6 m) for Use Condition V. If *yes*, the user works in the two columns at the center of the table (i.e., those grouped under the heading *Dead Ends*) and scores the value based on the longest dead-end corridor. If *no*, the user works in the three columns at the right of the table and scores the value based on the travel distance as detailed in 5.4.11.1.

Note *i* to Worksheet 5.5.3 recognizes that the dead-end corridor requirement of NFPA *101* 22.2.5.2 is stricter for Use Condition V than for Use Condition II through IV.

Note *g* of Worksheet 5.5.3 lessens the effect of negative values that would typically be scored in Safety Parameter 11, where dead-end corridors or long travel distances exist and fewer than two emergency movement routes, as addressed in Safety Parameter 10, are provided. The evaluation system works properly without having to assess a double penalty.

5.4.12

The text associated with scoring Safety Parameter 12, Vertical Openings, of Worksheet 5.5.3 appears in 5.4.12 through 5.4.12.2.6. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 12, is reflected in the third position of the related text paragraph numbers, in this case 5.4.12. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 12, "Vertical Openings," of Worksheet 5.5.3 considers all forms of vertical openings, not just those associated with egress routes such as penetrations of exit stair enclosures.

Where Worksheet 5.5.7, Item 1, requires to user to evaluate whether the facility's building services (e.g., HVAC systems) comply with the provisions of NFPA *101* 22.5 and 23.5, which reference Section 9.2 (i.e., requirements for compliance with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*), such evaluation is made using the requirements of NFPA 90A other than those related to enclosure of vertical openings, as the subject of vertical openings will have already been considered in Safety Parameter 12 of Worksheet 5.5.3.

Note *e* to Worksheet 5.5.3 prevents the user from unfairly scoring a safety parameter value of 2 where shafts are fire resistance rated in a one-story building. The concept recognizes that a one-story building is evaluated less harshly than multi-story buildings, so the evaluation system should not credit a shaft system that does little to protect the floor.

Note *f* to Worksheet 5.5.3 negates all negative scores for unprotected floor openings where the building is provided with a heat and smoke venting system as detailed in 5.4.13.4.

5.4.13

The text associated with scoring Safety Parameter 13, "Smoke Control," of Worksheet 5.5.3 appears in 5.4.13 through 5.4.13.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 13, is

reflected in the third position of the related text paragraph numbers, in this case 5.4.13. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

5.5

A full set of worksheets — Worksheet 5.5.1 through Worksheet 5.5.8 — must be completed for the building being evaluated, or for each area evaluated separately as permitted by Section 5.2. The NFPA 101A Origin and Development section, printed on page 101A-1, advises that the worksheets are copyrighted by NFPA, but users are permitted to copy them for private use.

5.5.1

Worksheet 5.5.1, Cover Sheet, identifies the building being evaluated as well as the evaluator and the date of evaluation.

5.5.2

Worksheet 5.5.2, Use Condition, is utilized to identify the most restrictive Use Condition present. See NFPA *101* 22.1.2.1.1 through 22.1.2.1.5 and 23.1.2.1.1 through 23.1.2.1.5.

5.5.3

Worksheet 5.5.3 is employed by circling the value selected for each of the thirteen safety parameters. See the text, and associated annotations, in 5.4 through 5.4.13.4. Interspersed in the annotated text are individual explanations of Worksheet 5.5.3 Note *a* through Note *i*.

5.5.4

Each of the thirteen circled safety parameter values of Worksheet 5.5.3 is transferred to Worksheet 5.5.4, Individual Safety Evaluations. The word "individual" in the title of the worksheet emphasizes that safety is to be evaluated from multiple perspectives. The four safety evaluations conducted include fire control (S_1), egress (S_2), refuge (S_3), and general fire safety (S_4). Each of the safety parameter values needs to be transferred two, or three, or four times to Worksheet 5.5.4, depending on whether the safety parameter contributes to the specific safety evaluation. Where a safety parameter has no effect on a given safety evaluation, the corresponding cell of the worksheet is X-ed out. Note also that multiple safety parameter values are weighted in specific columns so as to have only half the effect that the other applicable safety parameter values have (as indicated by the ÷2= notation) and as explained in the text of 5.5.4(1).

The arithmetic process of dividing a negative number by 2 is the same as dividing a positive number by 2. For example, (-4)/2 = -2 and (+4)/2 = 2. The intent is that the consideration is to carry only half as much weight — negative or positive — in the evaluation.

Each of the four columns of safety parameter values in Worksheet 5.5.4 is added. The text of 5.5.4(2) reminds the user that any negative numbers need to be deducted. The arithmetic exercises produce values for S_1, S_2, S_3, and S_4. Those values are transferred to Worksheet 5.5.6.

5.5.5

The user first identifies which of the three mandatory safety requirements worksheets — Worksheet 5.5.5A, Worksheet 5.5.5B, or Worksheet 5.5.5C — is applicable to the building being evaluated based on the title of each worksheet. Working within the applicable worksheet, the user circles the appropriate value in each of the four columns identified based upon the highest story used for resident containment.

The mandatory safety requirements values contained in Worksheet 5.5.5A, Worksheet 5.5.5B, or Worksheet 5.5.5C are calculated by the technical committee responsible for NFPA 101A to reflect a code-compliant situation in accordance with the requirements of NFPA *101*-2012. For a more detailed explanation see the NFPA 101A annex material numbered A.1.3.1.

The mandatory safety requirements values — S_a for fire control, S_b for egress, S_c for refuge, and S_d for general fire safety — are transferred to Worksheet 5.5.6.

5.5.6

Eight of the twelve boxes in Worksheet 5.5.6 represent values transferred in earlier steps as follows:

1. The values for S_1, S_2, S_3, and S_4 represent individual fire safety evaluations values calculated in Worksheet 5.5.4 and transferred to Worksheet 5.5.6 in Step 4.
2. The values for S_a, S_b, S_c, and S_d represent the mandatory safety requirements values selected from Worksheet 5.5.5A, Worksheet 5.5.5B, or Worksheet 5.5.5C and transferred to Worksheet 5.5.6 in Step 5.

The values for the remaining four boxes, represented by *C*, *E*, *R*, and *G*, are calculated by subtracting S_a from S_1, S_b from S_2, S_c from S_3, and S_d from S_4. The user then identifies whether each of the resultants, *C*, *E*, *R*, and *G*, is greater than, or equal to, zero. The appropriate box for *Yes* or *No* is checked.

5.5.7

Worksheet 5.5.7 is completed. All references in the worksheet are to NFPA *101*. Worksheet 5.5.7 is included as part of the FSES in recognition that the risk/hazard indexing system (see annotated text associated with 1.3.3) employing the safety parameters of Worksheet 5.5.3 does not evaluate some considerations required by NFPA *101* for *Code* compliance. Those considerations must be considered separately. The combined effect of the equivalency evaluation performed using Worksheet 5.5.1 through Worksheet 5.5.6 and the additional evaluation performed using Worksheet 5.5.7 are addressed, as conclusions, in Worksheet 5.5.8.

5.5.8

For the 2013 edition of NFPA 101A, Worksheet 5.5.8 was revised to formalize the process of concluding whether equivalency has been achieved by taking into account both the equivalency evaluation performed using Worksheets 5.5.1 through 5.5.6 and the additional evaluation performed using Worksheet 5.5.7. Revised Worksheet 5.5.8, Conclusions, requires mitigation of any considerations checked as *Not Met* in Worksheet 5.5.7 before a zone can be judged to provide fire and life safety equivalent to that prescribed in NFPA *101*.

(FIGURE 5.5) Worksheet 5.5.3 Safety Parameter Values

It is important that the user of the Chapter 5 FSES not attempt to score the parameter values of Worksheet 5.5.3 without consulting the associated text in 5.4 through 5.4.13.4. Those paragraphs are accompanied by significant annotated text on how to use the worksheet, including Note *a* through Note *i*.

For ease in moving between Worksheet 5.5.3 and the detailed text, note the correlative numbering scheme employed where the safety parameter number appears in the third position of the associated text paragraph number. The numbering scheme is illustrated in Exhibit 6.

Safety Parameter No.	Parameter Heading	Associated Text
1	Construction	5.4.**1**
2	Hazardous areas	5.4.**2**
3	Fire alarm	5.4.**3**
4	Smoke detection	5.4.**4**
5	Automatic sprinklers	5.4.**5**
6	Interior finish (corridors and egress)	5.4.**6**
7	Interior finish (other areas)	(see 5.4.6)
8	Cell/sleeping room enclosure	5.4.**8**
9	Separation of residential housing area from other areas	5.4.**9**
10	Exit system	5.4.**10**
11	Exit access	5.4.**11**
12	Vertical openings	5.4.**12**
13	Smoke control	5.4.**13**

Exhibit 6 Correlative numbering between safety parameter number and associated text.

6.2.1

The process of determining evacuation capability utilizing NFPA 101A Chapter 6 is best demonstrated by an example.

McKay House is an existing, small residential board and care facility with sleeping accommodations for 7 residents and 1 staff. Two residents have sleeping rooms on the ground level; 5 residents and the single staff member who is present during the night shift have sleeping rooms on the second floor.

McKay House is equipped to meet the requirements for a small residential board and care facility with slow evacuation capability. Management has used NFPA 101A Chapter 6 to document the evacuation capability of its seven residents with respect to the capabilities of the single staff member on duty during any shift. A resident who functioned highly in all aspects, so as to receive a rating of 1 on Worksheet 6.8.2, recently transferred to another facility. New resident Jack M. has taken residence in McKay House.

Management consults with staff who have observed the residents on a daily basis. It is agreed that the resident assistance needs are greatest during the nightshift (i.e., 11:00 p.m. to 7:00 a.m.). Resident profiles are updated and a new profile is created for new resident Jack M. The profile notes are made using the exception reporting method where nothing is noted if the resident compares comparably on the risk factors, addressed in NFPA 101A Chapter 6, with the typical resident of a college dormitory. The updated and new resident profiles are as follows.

1. Sally T. — 40 years old; resident for 5 years; sleeping room on ground level; removes leg braces to sleep; can reapply leg braces and walk to outside but process takes nearly 10 minutes; is obese and would require 2 staff to lift her into a wheelchair from which she could immediately and independently evacuate the building.
2. Garrett M. — 47 years old; resident for 5 years; sleeping room on ground level; travels by wheelchair; is capable of immediate self-transfer from bed to wheelchair.
3. Bill G. — 62 years old; resident for 4 years; sleeping room on second floor; suffered a stroke 12 months ago with resulting partial paralysis; walks slowly with assistance of a cane.
4. Lisa C. — 30 years old; resident for 4 years; sleeping room on second floor; takes a strong hypnotic medication at bedtime; will not self-awaken to alarm; needs to be awakened by staff, but can then leave the facility unassisted.
5. Melinda B. — 45 years old; resident for 3 years; sleeping room on second floor; has hidden in sleeping room closet when last two nighttime fire drills were conducted; when found by staff, has refused to cooperate in the drill.
6. Jacqueline T. — 73 years old; resident for 1 year; sleeping room on second floor; suffers from Alzheimer's disease; becomes emotionally upset and unwilling to follow instructions; staff must accompany her to outside, but she will stay there without further accompaniment.
7. Jack M. — 61 years old; resident for less than 1 month; is hearing impaired and misinterprets communications from staff; audible alarm will not awaken him; has not been trained to participate in fire drills.

One copy of NFPA 101A Worksheet 6.8.2, Rating the Resident on the Risk Factors, is completed for each resident. See Exhibits 7 through 13.

The highest score for each resident becomes that resident's evacuation assistance score. The evacuation assistance scores are transferred to Worksheet 6.8.4. The seven evacuation assistance scores are totaled. See Exhibit 14.

WORKSHEET 6.8.1 COVER SHEET

Worksheet for Rating Residents

Resident's name Sally T. Evaluator Ron C.

Facility McKay House Zone Whole facility Date 04-05-2013

Write any explanatory remarks here:

WORKSHEET 6.8.2 RATING THE RESIDENT ON THE RISK FACTORS

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ● score=0	Risk of Mild Resistance ○ score=6	Risk of Strong Resistance ○ score=20		0
II. Impaired Mobility (Check only one)	Self-Starting ○ score=0	Slow ● score=3	Needs Limited Assistance ○ score=6	Needs Full Assistance or Very Slow ○ score=20	3
III. Impaired Consciousness (Check only one)	No Significant Risk ● score=0	Partially Impaired ○ score=6	Totally Impaired ○ score=20		0
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ○ score=0	Needs Limited Assistance from 2 Staff ● score=30	Needs Full Assistance from 2 Staff ○ score=40		30
V. Response to Instructions (Check only one)	Follows Instructions ● score=1	Requires Supervision ○ score=3	Requires Considerable Attention/Might Not Respond ○ score=10		1
VI. Waking Response to Alarm (Check only one)	Response Probable ● score=0	Response Not Probable ○ score=6			0

VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ● score=0	No ○ score=8	0 +	
	Chooses and Completes Back-up Strategy	Yes ● score=0	No ○ score=4	0 +	
	Remains at Designated Location	Yes ● score=0	No ○ score=6	0	Sum of These Three Scores: 0

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 7 Worksheet for rating resident Sally T.

WORKSHEET 6.8.1 COVER SHEET

Worksheet for Rating Residents

Resident's name Garrett M. Evaluator Ron C.

Facility McKay House Zone Whole facility Date 04-05-2013

Write any explanatory remarks here:

WORKSHEET 6.8.2 RATING THE RESIDENT ON THE RISK FACTORS

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ● score=0	Risk of Mild Resistance ○ score=6	Risk of Strong Resistance ○ score=20		0
II. Impaired Mobility (Check only one)	Self-Starting ● score=0	Slow ○ score=3	Needs Limited Assistance ○ score=6	Needs Full Assistance or Very Slow ○ score=20	0
III. Impaired Consciousness (Check only one)	No Significant Risk ● score=0	Partially Impaired ○ score=6	Totally Impaired ○ score=20		0
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ● score=0	Needs Limited Assistance from 2 Staff ○ score=30	Needs Full Assistance from 2 Staff ○ score=40		0
V. Response to Instructions (Check only one)	Follows Instructions ● score=1	Requires Supervision ○ score=3	Requires Considerable Attention/Might Not Respond ○ score=10		1
VI. Waking Response to Alarm (Check only one)	Response Probable ● score=0	Response Not Probable ○ score=6			0
VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ● score=0	No ○ score=8	0 +	
	Chooses and Completes Back-up Strategy	Yes ● score=0	No ○ score=4	0 +	
	Remains at Designated Location	Yes ● score=0	No ○ score=6	0	Sum of These Three Scores: 0

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 8 Worksheet for rating resident Garrett M.

WORKSHEET 6.8.1 COVER SHEET

Worksheet for Rating Residents

Resident's name Bill G. Evaluator Ron C.

Facility McKay House Zone Whole facility Date 04-05-2013

Write any explanatory remarks here:

WORKSHEET 6.8.2 RATING THE RESIDENT ON THE RISK FACTORS

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ● score=0	Risk of Mild Resistance ○ score=6	Risk of Strong Resistance ○ score=20		0
II. Impaired Mobility (Check only one)	Self-Starting ○ score=0	Slow ● score=3	Needs Limited Assistance ○ score=6	Needs Full Assistance or Very Slow ○ score=20	3
III. Impaired Consciousness (Check only one)	No Significant Risk ● score=0	Partially Impaired ○ score=6	Totally Impaired ○ score=20		0
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ● score=0	Needs Limited Assistance from 2 Staff ○ score=30	Needs Full Assistance from 2 Staff ○ score=40		0
V. Response to Instructions (Check only one)	Follows Instructions ● score=1	Requires Supervision ○ score=3	Requires Considerable Attention/Might Not Respond ○ score=10		1
VI. Waking Response to Alarm (Check only one)	Response Probable ● score=0	Response Not Probable ○ score=6			0

VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ● score=0	No ○ score=8	0 +	
	Chooses and Completes Back-up Strategy	Yes ● score=0	No ○ score=4	0 +	
	Remains at Designated Location	Yes ● score=0	No ○ score=6	0	Sum of These Three Scores: 0

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 9 Worksheet for rating resident Bill G.

WORKSHEET 6.8.1 COVER SHEET

Worksheet for Rating Residents

Resident's name Lisa C. Evaluator Ron C.

Facility McKay House Zone Whole facility Date 04-05-2013

Write any explanatory remarks here:

WORKSHEET 6.8.2 RATING THE RESIDENT ON THE RISK FACTORS

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ● score=0	Risk of Mild Resistance ○ score=6	Risk of Strong Resistance ○ score=20		0
II. Impaired Mobility (Check only one)	Self-Starting ● score=0	Slow ○ score=3	Needs Limited Assistance ○ score=6	Needs Full Assistance or Very Slow ○ score=20	0
III. Impaired Consciousness (Check only one)	No Significant Risk ● score=0	Partially Impaired ○ score=6	Totally Impaired ○ score=20		0
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ● score=0	Needs Limited Assistance from 2 Staff ○ score=30	Needs Full Assistance from 2 Staff ○ score=40		0
V. Response to Instructions (Check only one)	Follows Instructions ● score=1	Requires Supervision ○ score=3	Requires Considerable Attention/Might Not Respond ○ score=10		1
VI. Waking Response to Alarm (Check only one)	Response Probable ○ score=0	Response Not Probable ● score=6			6

VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ○ score=0	No ● score=8	8 +	
	Chooses and Completes Back-up Strategy	Yes ● score=0	No ○ score=4	0 +	
	Remains at Designated Location	Yes ● score=0	No ○ score=6	0	Sum of These Three Scores: 8

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 10 Worksheet for rating resident Lisa C.

WORKSHEET 6.8.1 COVER SHEET

Worksheet for Rating Residents

Resident's name Melinda B. Evaluator Ron C.

Facility McKay House Zone Whole facility Date 04-05-2013

Write any explanatory remarks here:

WORKSHEET 6.8.2 RATING THE RESIDENT ON THE RISK FACTORS

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ○ score=0	Risk of Mild Resistance ○ score=6	Risk of Strong Resistance ● score=20		20
II. Impaired Mobility (Check only one)	Self-Starting ● score=0	Slow ○ score=3	Needs Limited Assistance ○ score=6	Needs Full Assistance or Very Slow ○ score=20	0
III. Impaired Consciousness (Check only one)	No Significant Risk ● score=0	Partially Impaired ○ score=6	Totally Impaired ○ score=20		0
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ● score=0	Needs Limited Assistance from 2 Staff ○ score=30	Needs Full Assistance from 2 Staff ○ score=40		0
V. Response to Instructions (Check only one)	Follows Instructions ● score=1	Requires Supervision ○ score=3	Requires Considerable Attention/Might Not Respond ○ score=10		1
VI. Waking Response to Alarm (Check only one)	Response Probable ● score=0	Response Not Probable ○ score=6			0

VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ○ score=0	No ● score=8	8 +	
	Chooses and Completes Back-up Strategy	Yes ○ score=0	No ● score=4	4 +	
	Remains at Designated Location	Yes ○ score=0	No ● score=6	6	Sum of These Three Scores: 18

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 11 Worksheet for rating resident Melinda B.

WORKSHEET 6.8.1 COVER SHEET

Worksheet for Rating Residents

Resident's name Jacqueline T. Evaluator Ron C.

Facility McKay House Zone Whole facility Date 04-05-2013

Write any explanatory remarks here:

WORKSHEET 6.8.2 RATING THE RESIDENT ON THE RISK FACTORS

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ● score=0	Risk of Mild Resistance ○ score=6	Risk of Strong Resistance ○ score=20		0
II. Impaired Mobility (Check only one)	Self-Starting ● score=0	Slow ○ score=3	Needs Limited Assistance ○ score=6	Needs Full Assistance or Very Slow ○ score=20	0
III. Impaired Consciousness (Check only one)	No Significant Risk ● score=0	Partially Impaired ○ score=6	Totally Impaired ○ score=20		0
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ● score=0	Needs Limited Assistance from 2 Staff ○ score=30	Needs Full Assistance from 2 Staff ○ score=40		0
V. Response to Instructions (Check only one)	Follows Instructions ○ score=1	Requires Supervision ○ score=3	Requires Considerable Attention/Might Not Respond ● score=10		10
VI. Waking Response to Alarm (Check only one)	Response Probable ● score=0	Response Not Probable ○ score=6			0

VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ○ score=0	No ● score=8	8	
	Chooses and Completes Back-up Strategy	Yes ○ score=0	No ● score=4	+ 4	
	Remains at Designated Location	Yes ● score=0	No ○ score=6	+ 0	Sum of These Three Scores: 12

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 12 Worksheet for rating resident Jacqueline T.

WORKSHEET 6.8.1 COVER SHEET

Worksheet for Rating Residents

Resident's name Jack M. Evaluator Ron C.

Facility McKay House Zone Whole facility Date 04-05-2013

Write any explanatory remarks here:

WORKSHEET 6.8.2 RATING THE RESIDENT ON THE RISK FACTORS

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ● score=0	Risk of Mild Resistance ○ score=6	Risk of Strong Resistance ○ score=20		0
II. Impaired Mobility (Check only one)	Self-Starting ● score=0	Slow ○ score=3	Needs Limited Assistance ○ score=6	Needs Full Assistance or Very Slow ○ score=20	0
III. Impaired Consciousness (Check only one)	No Significant Risk ● score=0	Partially Impaired ○ score=6	Totally Impaired ○ score=20		0
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ● score=0	Needs Limited Assistance from 2 Staff ○ score=30	Needs Full Assistance from 2 Staff ○ score=40		0
V. Response to Instructions (Check only one)	Follows Instructions ○ score=1	Requires Supervision ● score=3	Requires Considerable Attention/Might Not Respond ○ score=10		3
VI. Waking Response to Alarm (Check only one)	Response Probable ○ score=0	Response Not Probable ● score=6			6

VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ○ score=0	No ● score=8	8	
	Chooses and Completes Back-up Strategy	Yes ○ score=0	No ● score=4	+ 4	
	Remains at Designated Location	Yes ○ score=0	No ● score=6	+ 6	Sum of These Three Scores: 18

(For use with NFPA 101A-2013/NFPA *101*-2012)

(p. 1 of 4)

Exhibit 13 Worksheet for rating resident Jack M.

WORKSHEET 6.8.3 DETERMINING THE RESIDENT'S OVERALL NEED FOR ASSISTANCE

Compare the numbers in the seven score boxes filled in on Worksheet 6.8.2. Take the highest score from the score boxes and write it in the box at the right.

Evacuation Assistance Score

Notes:

See individual Worksheet 6.8.2 for each resident

WORKSHEET 6.8.4 RESIDENT SCORES

Resident Name	Evac. Assistance Score	Resident Name	Evac. Assistance Score
Sally T.	30		
Garrett M.	1		
Bill G.	3		
Lisa C.	8		
Melinda B.	20		
Jacqueline T.	12		
Jack M.	18		
Evacuation Assistance Score Total	92	**Evacuation Assistance Score Total**	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 2 of 4)

Exhibit 14 Resident scores and total evacuation assistance score.

Management then proceeds to evaluate the facility staff capabilities. Evacuation capability is defined in NFPA *101* as follows:

> **Evacuation Capability.** The ability of occupants, residents, and staff as a group either to evacuate the building or to relocate from the point of occupancy to a point of safety.

Management and staff agree that the nightshift (11:00 p.m. to 7:00 a.m.) constitutes the shift where staff level of evacuation capability is most diminished, because the single staff person is permitted to sleep. Worksheets 6.8.5, 6.8.6, 6.8.7, and 6.8.8 are completed to reflect this. See Exhibit 15.

The facility is rated relative to vertical travel, the evacuation capability score is calculated, and the evacuation capability for the facility is determined using Worksheet 6.8.9, Worksheet 6.8.10, and Worksheet 6.8.11. See Exhibit 16.

Based on the result shown in Worksheet 6.8.11 in Exhibit 16, the facility is determined to be of impractical evacuation capability. Yet, the facility is outfitted and operated to accommodate slow evacuation capability and does not meet the requirements for impractical evacuation capability. The change from slow evacuation capability to impractical evacuation has the effect of putting the facility into noncompliance with NFPA *101* Chapter 33 for existing, small residential board and care occupancies. Management determines that an interim solution might be for the single staff member on duty during the nightshift to remain awake and on duty. Worksheet 6.8.7 and Worksheet 6.8.8 are revisited and the promptness score changes from 16 to 20 to reflect that staff is immediately available so as to ensure alarm effectiveness. See Exhibit 17.

Worksheet 6.8.10 and Worksheet 6.8.11 are revisited to reflect the revised staff promptness of response score. See Exhibit 18.

Based on the result shown in Worksheet 6.8.11 in Exhibit 18, the facility is determined to be of slow evacuation capability. The facility is outfitted and operated to accommodate slow evacuation capability, so the facility is once again in compliance with NFPA *101* Chapter 33 for existing, small residential board and care occupancies.

Management decides that the interim solution of keeping the nightshift staff member awake and on duty is not a feasible long-term solution. Scrutiny of the Chapter 6 evacuation capability calculations shows that resident Jack M.'s score can be made better if he receives fire drill training and performs adequately in upcoming fire drills. The facility provides Jack M. with the requisite training, and Jack successfully participates in two monthly drills. Worksheet 6.8.1 is revisited relative to Jack M.'s rating. Each of the three subparts to Item VII Response to Fire Drills changes to a score of 0 in the *Yes* column, and the highest score becomes a value of 6 from Item VI relative to waking response to alarm. Jack M.'s evacuation assistance score is recorded as 6. See Exhibit 19.

Worksheet 6.8.4 is revisited. Jack M.'s revised evacuation assistance score is recorded, and the resident total score is recalculated. See Exhibit 20.

Worksheet 6.8.7 and Worksheet 6.8.8 are revisited, and the promptness score is chosen to reflect that the single staff member on the overnight shift will again be permitted to sleep. See Exhibit 21.

Worksheet 6.8.10 and Worksheet 6.8.11 are revisited to reflect the revised total resident evacuation assistance score and the revised staff promptness of response score. See Exhibit 22. Based on the result shown in Worksheet 6.8.11 in Exhibit 22, the facility is determined to be of slow evacuation capability. The facility is outfitted and operated to accommodate slow evacuation capability, so regaining an evacuation capability of slow once again puts the facility in compliance with NFPA *101* Chapter 33 for existing, small residential board and care occupancies.

WORKSHEET 6.8.5 COVER SHEET

Staff Shift Score

Facility McKay House Zone Whole facility

Evaluator Ron C. Date 04-05-2013

Staff Shift: From 11:00 pm To 7:00 am

WORKSHEET 6.8.6 STAFF RESPONSE AND TRAINING

	Yes	No
A protection plan has been promulgated and all staff members considered in this rating have been trained in its implementation. *(See 6.5.2.1.)*	✓	
The total available staff at any given time is able to handle the individual evacuation needs of each resident who is in the facility. *(See 6.5.2.2.)*	✓	
Every staff member considered in this rating can meaningfully participate in the evacuation of every resident. *(See 6.5.2.3.)*	✓	
All staff members considered in this rating are required to be in the facility when on duty, except as permitted. *(See 6.5.2.4.)*	✓	
At least 12 fire drills were conducted during the previous year. *(See 6.5.2.5.)*	✓	

All items must score "Yes" before proceeding.

WORKSHEET 6.8.7 PROMPTNESS OF RESPONSE SCORES

Staff Availablility	Alarm Effectiveness	
	Assured	Not Assured
Standby or asleep	(16)	2
Immediately available	20	2
Immediately available and close by	20	10

WORKSHEET 6.8.8 STAFF SHIFT SCORES

Staff Name	Promptness of Response Score	Staff Name	Promptness of Response Score
Mr. T	16		
Staff Shift Score Total	16	Staff Shift Score Total	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

Exhibit 15 Determining the staff shift promptness of response score.

WORKSHEET 6.8.9 RATING THE FACILITY

	Vertical Distance from Sleeping Rooms to Exits		
	All SR on Floors with Direct Exit	Any SR One Floor from Exit	Any SR Two or More Floors from Exit
Small Facility[a]	○ Score 0.8	● Score 1.0	○ Score 1.2
Large Facility or Apartment[b]		○ Score 1.0	

[a] Small facilities have 16 or fewer residents.
[b] See 6.6.6 for apartments.

WORKSHEET 6.8.10 CALCULATION OF EVACUATION CAPABILITY SCORE

Total Resident Evacuation Assistance Score (Worksheet 6.8.4): 92

X

Vertical Distance from Sleeping Room to Exit (Worksheet 6.8.9): 1.0

Staff Shift Score (Worksheet 6.8.8): 16

=

Evacuation Capability Score: 5.75

(go to Worksheet 6.8.11)

WORKSHEET 6.8.11 EVACUATION CAPABILITY SCORE

Evacuation Capability Score	Level of Evacuation Capability	Evacuation Capability for this Facility or Zone
≤1.5	Prompt	
>1.5 to ≤5.0	Slow	
(>5.0)	Impractical	Impractical

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

Exhibit 16 Determining evacuation capability for the facility.

WORKSHEET 6.8.5 COVER SHEET

Staff Shift Score

Facility McKay House Zone Whole facility

Evaluator Ron C. Date 04-05-2013

Staff Shift: From 11:00 pm To 7:00 am

WORKSHEET 6.8.6 STAFF RESPONSE AND TRAINING

	Yes	No
A protection plan has been promulgated and all staff members considered in this rating have been trained in its implementation. *(See 6.5.2.1.)*	✓	
The total available staff at any given time is able to handle the individual evacuation needs of each resident who is in the facility. *(See 6.5.2.2.)*	✓	
Every staff member considered in this rating can meaningfully participate in the evacuation of every resident. *(See 6.5.2.3.)*	✓	
All staff members considered in this rating are required to be in the facility when on duty, except as permitted. *(See 6.5.2.4.)*	✓	
At least 12 fire drills were conducted during the previous year. *(See 6.5.2.5.)*	✓	

All items must score "Yes" before proceeding.

WORKSHEET 6.8.7 PROMPTNESS OF RESPONSE SCORES

Staff Availablility	Alarm Effectiveness	
	Assured	Not Assured
Standby or asleep	16	2
Immediately available	20	2
Immediately available and close by	20	10

WORKSHEET 6.8.8 STAFF SHIFT SCORES

Staff Name	Promptness of Response Score	Staff Name	Promptness of Response Score
Mr. T	20		
Staff Shift Score Total	20	Staff Shift Score Total	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

Exhibit 17 Staff shift promptness of response score upgraded to reflect that staff is awake.

WORKSHEET 6.8.9 RATING THE FACILITY

	Vertical Distance from Sleeping Rooms to Exits		
	All SR on Floors with Direct Exit	Any SR One Floor from Exit	Any SR Two or More Floors from Exit
Small Facility[a]	○ Score 0.8	● Score 1.0	○ Score 1.2
Large Facility or Apartment[b]		○ Score 1.0	

[a] Small facilities have 16 or fewer residents.
[b] See 6.6.6 for apartments.

WORKSHEET 6.8.10 CALCULATION OF EVACUATION CAPABILITY SCORE

Total Resident Evacuation Assistance Score (Worksheet 6.8.4): 92

X

Vertical Distance from Sleeping Room to Exit (Worksheet 6.8.9): 1.0

Staff Shift Score (Worksheet 6.8.8): 20

=

Evacuation Capability Score: 4.6

(go to Worksheet 6.8.11)

WORKSHEET 6.8.11 EVACUATION CAPABILITY SCORE

Evacuation Capability Score	Level of Evacuation Capability	Evacuation Capability for this Facility or Zone
≤1.5	Prompt	
>1.5 to ≤5.0	Slow	Slow
>5.0	Impractical	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

Exhibit 18 Recalculating the evacuation capability for the facility.

WORKSHEET 6.8.1 COVER SHEET

Worksheet for Rating Residents

Resident's name Jack M. Evaluator Ron C.

Facility McKay House Zone Whole facility Date 07-10-2013

Write any explanatory remarks here:

WORKSHEET 6.8.2 RATING THE RESIDENT ON THE RISK FACTORS

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ● score=0	Risk of Mild Resistance ○ score=6	Risk of Strong Resistance ○ score=20		0
II. Impaired Mobility (Check only one)	Self-Starting ● score=0	Slow ○ score=3	Needs Limited Assistance ○ score=6	Needs Full Assistance or Very Slow ○ score=20	0
III. Impaired Consciousness (Check only one)	No Significant Risk ● score=0	Partially Impaired ○ score=6	Totally Impaired ○ score=20		0
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ● score=0	Needs Limited Assistance from 2 Staff ○ score=30	Needs Full Assistance from 2 Staff ○ score=40		0
V. Response to Instructions (Check only one)	Follows Instructions ○ score=1	Requires Supervision ● score=3	Requires Considerable Attention/Might Not Respond ○ score=10		3
VI. Waking Response to Alarm (Check only one)	Response Probable ○ score=0	Response Not Probable ● score=6		→	6

VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ● score=0	No ○ score=8	0 +	
	Chooses and Completes Back-up Strategy	Yes ● score=0	No ○ score=4	0 +	
	Remains at Designated Location	Yes ● score=0	No ○ score=6	0	Sum of These Three Scores: 0

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 1 of 4)

Exhibit 19 Jack M.'s highest score is 6 based on the training and participation in drills.

WORKSHEET 6.8.3 DETERMINING THE RESIDENT'S OVERALL NEED FOR ASSISTANCE

Compare the numbers in the seven score boxes filled in on Worksheet 6.8.2. Take the highest score from the score boxes and write it in the box at the right.

Evacuation Assistance Score: [ ]

Notes:

See individual Worksheet 6.8.2 for each resident

WORKSHEET 6.8.4 RESIDENT SCORES

Resident Name	Evac. Assistance Score	Resident Name	Evac. Assistance Score
Sally T.	30		
Garrett M.	1		
Bill G.	3		
Lisa C.	8		
Melinda B.	20		
Jacqueline T.	12		
Jack M.	6		
Evacuation Assistance Score Total	80	**Evacuation Assistance Score Total**	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 2 of 4)

Exhibit 20 Resident total evacuation assistance score recalculated.

WORKSHEET 6.8.5 COVER SHEET

Staff Shift Score

Facility McKay House Zone Whole facility

Evaluator Ron C. Date 07-10-2013

Staff Shift: From 11:00 pm To 7:00 am

WORKSHEET 6.8.6 STAFF RESPONSE AND TRAINING

	Yes	No
A protection plan has been promulgated and all staff members considered in this rating have been trained in its implementation. *(See 6.5.2.1.)*	✓	
The total available staff at any given time is able to handle the individual evacuation needs of each resident who is in the facility. *(See 6.5.2.2.)*	✓	
Every staff member considered in this rating can meaningfully participate in the evacuation of every resident. *(See 6.5.2.3.)*	✓	
All staff members considered in this rating are required to be in the facility when on duty, except as permitted. *(See 6.5.2.4.)*	✓	
At least 12 fire drills were conducted during the previous year. *(See 6.5.2.5.)*	✓	

All items must score "Yes" before proceeding.

WORKSHEET 6.8.7 PROMPTNESS OF RESPONSE SCORES

Staff Availablility	Alarm Effectiveness	
	Assured	Not Assured
Standby or asleep	(16)	2
Immediately available	20	2
Immediately available and close by	20	10

WORKSHEET 6.8.8 STAFF SHIFT SCORES

Staff Name	Promptness of Response Score	Staff Name	Promptness of Response Score
Mr. T	16		
Staff Shift Score Total	16	Staff Shift Score Total	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 3 of 4)

Exhibit 21 Staff shift promptness of response score revised to reflect that staff will be permitted to sleep.

WORKSHEET 6.8.9 RATING THE FACILITY

	Vertical Distance from Sleeping Rooms to Exits		
	All SR on Floors with Direct Exit	Any SR One Floor from Exit	Any SR Two or More Floors from Exit
Small Facility[a]	○ Score 0.8	● Score 1.0	○ Score 1.2
Large Facility or Apartment[b]		○ Score 1.0	

[a] Small facilities have 16 or fewer residents.
[b] See 6.6.6 for apartments.

WORKSHEET 6.8.10 CALCULATION OF EVACUATION CAPABILITY SCORE

Total Resident Evacuation Assistance Score (Worksheet 6.8.4): 80

X

Vertical Distance from Sleeping Room to Exit (Worksheet 6.8.9): 1.0

=

Evacuation Capability Score: 5.0

(go to Worksheet 6.8.11)

16

Staff Shift Score (Worksheet 6.8.8)

WORKSHEET 6.8.11 EVACUATION CAPABILITY SCORE

Evacuation Capability Score	Level of Evacuation Capability	Evacuation Capability for this Facility or Zone
≤1.5	Prompt	
>1.5 to ≤5.0	Slow	Slow
>5.0	Impractical	

(For use with NFPA 101A-2013/NFPA *101*-2012) (p. 4 of 4)

Exhibit 22 Recalculating the evacuation capability for the facility to reflect Jack M.'s training/drilling and that staff will be permitted to sleep.

Chapter 7

Chapter 7 presents the third of five occupancy-specific fire safety evaluation systems (FSESs). Chapter 7 divides its system for board and care occupancies into three separate FSESs or subsystems (see 7.1.3) as follows:

1. One for evaluating small residential board and care occupancies (i.e., maximum 16 residents), as addressed in NFPA *101*-2012, *Life Safety Code*, Section 32.2 and Section 33.2
2. One for evaluating large residential board and care occupancies (i.e., more than 16 residents), as addressed in NFPA *101* Section 32.3 and Section 33.3
3. One for evaluating whether an apartment building is suitable for housing one or more residential board and care occupancies, as addressed in NFPA 101 Section 32.4 and Section 33.4

Each FSES provides a formalized method or tool for measuring the level of life safety against that required by NFPA *101* for use in an equivalency submittal to the authority having jurisdiction (AHJ).

Chapter 7 applies only to residential board and care occupancies as addressed in NFPA *101* Chapter 32, New Residential Board and Care Occupancies, and Chapter 33, Existing Residential Board and Care Occupancies. For health care occupancies, see Chapter 4.

7.1.1

NFPA 101A is unique in that, although it is a guide, the chapters presenting FSES utilize the word *shall*. The context in which the residential board and care occupancies FSESs are written in mandatory language is explained in the second sentence of 7.1.1.

7.1.2

The provision of 7.1.2 is marked with a vertical bar in the margin of this 2013 edition of NFPA 101A. The change bar designates a change from the 2010 edition. The change relates to existing, large residential board and care occupancies with impractical evacuation capability. In the 2009 and earlier editions of NFPA *101*, existing, large residential board and care facilities with impractical evacuation capability were not addressed in Chapter 33. The user was sent to NFPA *101* Chapter 19 to address such facilities as limited care health care occupancies. NFPA *101*-2012 addresses existing, large residential board and care facilities with impractical evacuation capability in Chapter 33. NFPA 101A-2013 Chapter 7 includes revisions to do the same.

NFPA *101* applies both to new construction and to existing buildings. Where a new residential board and care occupancy is compliant with the requirements of NFPA *101* Chapter 32 for new residential board and care occupancies, there is no need to utilize NFPA 101A Chapter 7. Similarly, where an existing residential board and care occupancy is compliant with the requirements of NFPA *101* Chapter 33 for existing residential board and care occupancies, there is no need to utilize NFPA 101A Chapter 7. The user of NFPA *101* Chapter 32 or Chapter 33 might employ NFPA 101A where the facility is not compliant with the requirements of the applicable chapters of NFPA *101* and an equivalency submittal is to be prepared for submittal to the AHJ.

NFPA 101A presents a formalized method for preparing an equivalency submittal, for residential board and care occupancies, in accordance with the equivalency concept permitted by NFPA *101* Section 1.4, which reads as follows:

> **1.4* Equivalency.** Nothing in this *Code* is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this *Code*.
>
> **1.4.1 Technical Documentation.** Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.
>
> **1.4.2 Approval.** The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.
>
> **1.4.3* Equivalent Compliance.** Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this *Code*.

Once the AHJ approves an NFPA 101A equivalency submittal as providing a facility with life safety that, *in toto,* is equivalent to that provided by compliance with all applicable provisions of NFPA *101*, such facility is deemed to comply with NFPA *101* as stated above in the text from NFPA *101* 1.4.3. However, such equivalency is relative to compliance with the provisions of a specific edition of NFPA *101*. Where a jurisdiction adopts a newer edition of NFPA *101*, the equivalency submittal will need to be conducted anew, utilizing the applicable editions of NFPA *101* and NFPA 101A. For example, in a jurisdiction that enforces the 2000 edition of NFPA *101*, an equivalency submittal is prepared using the 2001 edition of NFPA 101A. The jurisdiction then updates to the 2012 edition of NFPA *101*, and a new equivalency submittal is prepared using the 2013 edition of NFPA 101A.

As an example of the case cited in the previous paragraph, at the time a residential board and care occupancy equivalency submittal was prepared for an existing assisted living building per NFPA 101A-2001, the assisted living building was subject to the requirements of NFPA *101*-2000 for an existing residential board and care occupancy. The NFPA 101A FSES mandatory values used for the assisted living building were those applicable to existing residential board and care occupancies. In 2013 the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used for the existing assisted living building are those applicable to existing residential board and care occupancies. The new equivalency submittal reflects that the NFPA *101* requirements applicable to existing residential board and care occupancies might have changed between the 2000 and 2012 editions.

As another example, at the time a residential board and care occupancy equivalency submittal was prepared for an assisted living building per NFPA 101A-2001, the assisted living building was new and subject to the requirements of NFPA *101*-2000 for new residential board and care occupancies. The NFPA 101A FSES mandatory values used for the assisted living building were those applicable to new residential board and care occupancies. In 2013 the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used, for what has become an existing assisted living building, are those applicable to existing residential board and care occupancies. Some might argue that the residential board and care occupancy is being held to a lesser level of scrutiny, given that it is to be evaluated via the provisions applicable to existing buildings, which typically are less stringent than those applied to new construction. They are concerned that the new equivalency submittal, based on the mandatory values of NFPA 101A applicable to existing residential board and care occupancies, will permit life safety features to go unrecognized that were abandoned, or not otherwise maintained, in the years between equivalency submittals. Given that NFPA *101* and NFPA 101A are to be used together, such situation is avoided because the AHJ will enforce the following provision of NFPA *101*-2012:

> **4.6.12.2** No existing life safety feature shall be removed or reduced where such feature is a requirement for new construction.

7.2

All numbered text beginning with the digits 7.2 applies to small residential board and care facilities. For comparable text for large residential board and care facilities, see Section 7.4. For text associated with evaluating the suitability of an apartment building to house one or more residential board and care occupancies, see Section 7.6.

7.2.1

The FSES for small residential board and care occupancies is more than the forms presented in Worksheet 7.3.1 through Worksheet 7.3.7. The three pages of forms are supplemented by more than three pages of text detailing, mainly, the considerations requiring attention for purposes of completing Worksheet 7.3.2 related to safety parameter values. In addition to the forms and detailed text of 7.2.1 through 7.2.4.8.6.2, the NFPA 101A user needs a well-based foundation in the use of NFPA *101* Chapters 32 and 33, and related core Chapters 1 through 11. **Note that persons without experience in the use of NFPA *101* should not attempt an equivalency submittal preparation using NFPA 101A**. Each equivalency submittal needs to be evaluated, via careful scrutiny of the AHJ, with due consideration of the preparer's credentials.

7.2.2.1

The provision of 7.2.2.1 directs the user to evaluate the facility as a whole. Further, facilities separated from other occupancies in the same building are permitted to be evaluated independently of the remainder of the building.

7.2.3

The provision of 7.2.3 makes clear that the presence of a building feature or system does not, by itself, provide positive credit in the evaluation. Such feature or system needs to be maintained in order to receive credit contributing toward the equivalency. For example, where a manual fire alarm system without fire department notification is present but not maintained, Safety Parameter 3 of Worksheet 7.3.2 would be scored with a value of 0, rather than a value of 1.

7.2.4.1

The text associated with scoring Safety Parameter 1, "Construction/Fire Resistance," of Worksheet 7.3.2 appears in 7.2.4.1 through 7.2.4.1.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 1, is reflected in the fourth position of the related text paragraph numbers, in this case 7.2.4.1. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

To score Safety Parameter 1, "Construction/Fire Resistance," of Worksheet 7.3.2, via use of the text of 7.2.4.1.2, the user needs to be familiar with the building construction type notations as used in NFPA *101* and as explained further in NFPA *101* Table A.8.2.1.2. Note that there are no minimum construction requirements in NFPA *101* 32.2.1.3 for new, small residential board and care facilities, as all new, small facilities are required to be sprinklered. Chapter 33 includes construction requirements for existing, small residential board and care facilities in 33.2.1.3 for all but prompt evacuation capability facilities. The FSES accurately reflects the requirements of NFPA *101* in the mandatory safety requirements of Worksheet 7.3.4A for new facilities and Worksheet 7.3.4B for existing facilities.

7.2.4.2

The text associated with scoring Safety Parameter 2, "Hazardous Areas," of Worksheet 7.3.2 appears in 7.2.4.2 through 7.2.4.2.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 2, is reflected in the fourth position of the related text paragraph numbers, in this case 7.2.4.2. The consistent numbering scheme lends ease to moving between the worksheet and the related text. Note, too, that the assignment of safety parameter values for hazardous areas is a four-step process.

7.2.4.2

The provision of 7.2.4.2 sends the user to NFPA *101* 32.2.3.2 and 33.2.3.2 to identify hazardous areas for the small residential board and care occupancy. Hazardous areas for a small residential board and care occupancy are relative to the contents normally found in a one- or two-family dwelling and include areas for cartooned storage, food, or household maintenance items in wholesale or institutional-type quantities and concentrations, and mass storage of resident's belongings.

7.2.4.2

The user next determines what portion of the facility is exposed by the hazardous area. This is consistent with the treatment of hazardous areas in NFPA *101* 32.2.3 and 33.2.3, where the required protection varies depending on whether the hazardous area is on the same floor as, and is in or abuts, a primary means of escape.

7.2.4.2

The user next determines what protection is provided for the hazardous area. Protection takes the form of sprinklers, smoke-resisting barriers, and fire resistance–rated barriers — either applied separately or in combinations.

7.2.4.2

Lastly, the user applies Table 7.2.4.2.4 to determine the degree of deficiency. The resulting degree of deficiency might be that of a double deficiency, single deficiency, or no deficiency.

After determining the degree of deficiency, the user goes to Safety Parameter 2 of Worksheet 7.3.2, where the results of having performed Step 1 through Step 4 lead to scoring the safety parameter.

7.2.4.3

The text associated with scoring Safety Parameter 3, "Manual Fire Alarm," of Worksheet 7.3.2 appears in 7.2.4.3 through 7.2.4.3.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 3, is reflected in the fourth position of the related text paragraph number, in this case 7.2.4.3. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The consideration related to Safety Parameter 3, "Manual Fire Alarm," involves first determining whether a manual fire alarm system that meets the requirements of NFPA *101* 32.2.3.4.1 and 33.2.3.4.1 is provided. If such manual fire alarm system is provided, the user next needs to determine the degree to which fire department notification is provided.

7.2.4.4

The text associated with scoring Safety Parameter 4, "Smoke Detection and Alarm," of Worksheet 7.3.2 appears in 7.2.4.4 through 7.2.4.4.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 4, is reflected in the fourth position of the related text paragraph number, in this case 7.2.4.4. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The consideration related to Safety Parameter 4, "Smoke Detection and Alarm," is one of determining to what degree smoke will be automatically detected and residents will receive automatic notification of the smoky condition.

Note *e* to Worksheet 7.3.2 equates the presence of quick-response sprinklers with the early warning provided by smoke detection in areas where residents do not sleep, but the credit given is dependent on smoke detection being within the sleeping rooms to warn residents of a smoky condition within their own room. The alarm notification from sprinkler water flow will not occur until the sprinkler senses sufficient heat. A smoldering fire in a resident room can generate untenable levels of smoke before a sprinkler will operate.

Note *f* to Worksheet 7.3.2 awards an additional point to existing facilities with smoke detection in each bedroom and quick-response sprinklers throughout the facility for reasons similar to that explained in the preceding paragraph. Existing small residential board and care facilities are not required by NFPA *101* to employ the quick-response form of sprinkler technology.

7.2.4.5

The text associated with scoring Safety Parameter 5, "Automatic Sprinklers," of Worksheet 7.3.2 appears in 7.2.4.5 through 7.2.4.5.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 5, is reflected in the fourth position of the related text paragraph numbers, in this case 7.2.4.5. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

7.2.4.6

The text associated with scoring Safety Parameter 6, "Interior Finish," of Worksheet 7.3.2 appears in 7.2.4.6 through 7.2.4.6.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 6, is reflected in the fourth position of the related text paragraph number, in this case 7.2.4.6. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note that the interior finish consideration, required for scoring Safety Parameter 6 of Worksheet 7.3.2, includes both interior wall finish and interior ceiling finish. Walls and ceilings are grouped into the category of *interior wall and ceiling finish* as used in NFPA *101* 10.2.3.

In scoring any safety parameter of Worksheet 7.3.2 it is paramount that the surveyor choose the value associated with what is present. This is particularly important relative to the interior finish safety value. NFPA *101* permits the required interior wall or ceiling classification to be reduced by one category due to the presence of automatic sprinkler protection (e.g., where the *Code* requires nothing inferior to Class B, the presence of sprinklers permits the use of Class C). If the surveyor sees existing Class C interior finish (i.e., flame spread index of between 76 and 200), the surveyor is to circle the safety parameter value for Class C regardless of the presence of

sprinklers, not that for Class B. The FSES mandatory values (as addressed in Worksheet 7.3.4A and Worksheet 7.3.4B) are calibrated to provide credit for sprinklers without the surveyor taking credit for the presence of sprinklers relative to the scoring of Safety Parameter 6. This prevents the surveyor from incorrectly taking a double credit.

7.2.4.7

The text associated with scoring Safety Parameter 7, "Separation of Sleeping Rooms," of Worksheet 7.3.2 appears in 7.2.4.7 through 7.2.4.7.3.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 7, is reflected in the fourth position of the related text paragraph numbers, in this case 7.2.4.7. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 7, "Separation of Sleeping Rooms," of Worksheet 7.3.2 is scored using a two-step approach. First, the user determines whether there are any unprotected vertical openings. If *yes,* the user works in the three columns at the center of the table (i.e., those grouped under the heading *Unprotected Vertical Openings*) and scores the value based on the protection provided by the corridor walls. If *no,* the user works in the six columns at the right of the table and scores the value based on the protection provided by the corridor walls.

Note *d* to Table 7.3.2 clarifies for the user that a single-level building is to be treated the same as a building with protected vertical openings.

Note *a* to Table 7.3.2 lowers the score where credit is taken in Safety Parameter 1 for minimum 15-minute thermal barrier but the building is not sprinklered.

Note *c* to Table 7.3.2 directs that a 20-minute fire protection–rated door with automatic closer is to be credited as smoke resisting even if it is not the minimum 1 ¾ in. thick, solid-bonded wood-core door detailed in NFPA *101* 32.2.3.6.1(2) and 33.2.3.6.1(2).

7.2.4.8

The text associated with scoring Safety Parameter 8, "Means of Escape," of Worksheet 7.3.2 appears in 7.2.4.8 through 7.2.4.86.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 8, is reflected in the fourth position of the related text paragraph numbers, in this case 7.2.4.8. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The scoring of Safety Parameter 8, "Means of Escape," of Worksheet 7.3.2 is the most complicated of the eight safety parameters. The user must first determine whether means of escape exists on all sleeping levels. If *yes,* the user works within the upper row of the safety parameter values and next determines the number of remote routes. In *no,* the user works within the lower row of the safety parameter values and next determines whether the primary route is protected and, then, the number of remote routes. In either case, the text of 7.2.4.8 is needed to understand the cryptic labels used for the various categories in Safety Parameter 8 of Worksheet 7.3.2.

Note *b* to Worksheet 7.3.2 lowers the score on the means of escape consideration where the separation of sleeping rooms addressed in Safety Parameter 7 resulted in a score reflective of no corridor walls or incomplete corridor walls.

7.3

A full set of worksheets — Worksheet 7.3.1 through Worksheet 7.3.7 — must be completed for the small facility being evaluated. The NFPA 101A Origin and Development section, printed on page 101A-1, advises that the worksheets are copyrighted by NFPA, but users are permitted to copy them for private use.

7.3.1

Worksheet 7.3.1, Cover Sheet, identifies the small board and care facility being evaluated as well as the evaluator and the date of evaluation.

7.3.2

Worksheet 7.3.2 is employed by circling the value selected for each of the eight safety parameters. Interspersed in the annotated text are individual explanations of Worksheet 7.3.2 Note *a* through Note *f.*

7.3.3

Each of the eight circled safety parameter values of Worksheet 7.3.2 is transferred to Worksheet 7.3.3, Individual Safety Evaluations — Small Facility. The word "individual" in the title of the worksheet emphasizes that safety is to be evaluated from multiple perspectives. The four safety evaluations conducted include fire control (S_1), egress (S_2), refuge (S_3), and general fire safety (S_4). Each of the safety parameter values needs to be transferred two, three, or four times to Worksheet 7.3.3 depending on whether the safety parameter contributes to the specific safety evaluation. Where a safety parameter has no effect on a given safety evaluation, the corresponding cell of the worksheet is X-ed out. Note also that multiple safety parameter values are weighted in specific columns so as to have only half the effect that the other applicable safety parameter values have (as indicated by the ÷2= notation) and as explained in the text of subpart (1) to 7.3.3 Step 3.

The arithmetic process of dividing a negative number by 2 is the same as dividing a positive number by 2. For example, (-4)/2 = -2 and (+4)/2 = 2. The intent is that the consideration is to carry only half as much weight — negative or positive — in the evaluation.

Each of the four columns of values in Worksheet 7.3.3 is added. The text of subpart (2) to 7.3.3 Step 3 reminds the user that any negative numbers need to be deducted. The arithmetic exercises produce values for S_1, S_2, S_3, and S_4. Those values are transferred to Worksheet 7.3.5.

7.3.4

The user goes to Worksheet 7.3.4A for new small facilities, or the user goes to Worksheet 7.3.4B for existing small facilities.

Where Worksheet 7.3.4A applies, the user circles the value in each of four columns. Where Worksheet 7.3.4B applies, the user circles the appropriate value in each of four columns identified based upon the facility's evacuation capability (labeled as *Level of Evacuation Difficulty* in the left column of the worksheet).

The mandatory safety requirements values contained in Worksheet 7.3.4A and Worksheet 7.3.4B are calculated by the technical committee responsible for NFPA 101A to reflect a code-compliant situation in accordance with the requirements of NFPA *101*-2012. For a more detailed explanation see the NFPA 101A annex material numbered A.1.3.1.

The mandatory safety requirements values — S_a for fire control, S_b for egress, S_c for refuge, and S_d for general fire safety — are transferred to Worksheet 7.3.5.

7.3.5

The eight labeled boxes in Worksheet 7.3.5 represent values transferred in earlier steps as follows:

1. The values for S_1, S_2, S_3, and S_4 represent individual fire safety evaluation values calculated in Worksheet 7.3.3 and transferred to Worksheet 7.3.5 in Step 3.
2. The values for S_a, S_b, S_c, and S_d represent the mandatory safety requirements values selected from Worksheet 7.3.4A or Worksheet 7.3.4B and transferred to Worksheet 7.3.5 in Step 4.

The values for the remaining four, unlabeled boxes are calculated by subtracting S_a from S_1, S_b from S_2, S_c from S_3, and S_d from S_4. The user then identifies whether each of the resultants, is greater than, or equal to, zero. The appropriate box for *Yes* or *No* is checked.

7.3.6

Worksheet 7.3.6 is completed. The references in the worksheet are to NFPA *101*. Worksheet 7.3.6 is included as part of the FSES in recognition that the risk/hazard indexing system (see annotated text associated with 1.3.3) employing the safety parameters of Worksheet 7.3.2 does not evaluate the operating features provisions required by NFPA *101* for *Code* compliance. Those considerations must be considered separately. The combined effect of the equivalency evaluation performed using Worksheet 7.3.1 through Worksheet 7.3.5 and the additional evaluation performed using Worksheet 7.3.6 are addressed, as conclusions, in Worksheet 7.3.7.

7.3.7

For the 2013 edition of NFPA 101A, Worksheet 7.3.7 was revised to formalize the process of concluding whether equivalency has been achieved by taking into account both the equivalency evaluation performed using Worksheets 7.3.1 through 7.3.5 and the additional evaluation performed using Worksheet 7.3.6. Revised Worksheet 7.3.7, Conclusions, requires mitigation of the

consideration checked as *Not Met* in Worksheet 7.3.6 before the small facility can be judged to provide fire and life safety equivalent to that prescribed in NFPA *101*.

(FIGURE 7.3) Worksheet 7.3.2 Safety Parameter Values

It is important that the user of the Chapter 7 FSES for small facilities not attempt to score the parameter values of Worksheet 7.3.2 without consulting the associated text in 7.2 through 7.2.4.8.6.2. Those paragraphs are accompanied by significant annotated text on how to use the worksheet, including Note *a* through Note *f*.

For ease in moving between Worksheet 7.3.2 and the detailed text, note the correlative numbering scheme employed where the safety parameter number appears in the fourth position of the associated text paragraph number. The numbering scheme is illustrated in Exhibit 23.

Safety Parameter No.	Parameter Heading	Associated Text
1	Construction/fire resistance	7.2.4.**1**
2	Hazardous areas	7.2.4.**2**
3	Manual fire alarm	7.2.4.**3**
4	Smoke detection and alarm	7.2.4.**4**
5	Automatic sprinklers	7.2.4.**5**
6	Interior finish	7.2.4.**6**
7	Separation of sleeping rooms	7.2.4.**7**
8	Means of escape	7.2.4.**8**

Exhibit 23 Correlative numbering between safety parameter number and associated text for small facilities.

7.4

All numbered text beginning with the digits 7.4 applies to large residential board and care facilities. For comparable text for small residential board and care facilities, see Section 7.2. For text associated with evaluating the suitability of an apartment building to house one or more residential board and care occupancies, see Section 7.6.

7.4.1

The FSES for large residential board and care occupancies is more than the forms presented in Worksheet 7.5.1 through Worksheet 7.5.7. The four pages of forms are supplemented by more than six pages of text detailing, mainly, the considerations requiring attention for purposes of completing Worksheet 7.5.2 related to safety parameter values. In addition to the forms and detailed text of 7.4.1 through 7.4.4.11.5, the NFPA 101A user needs a well-based foundation in the use of NFPA *101* Chapters 32 and 33, and related core Chapters 1 through 11. **Note that persons without experience in the use of NFPA *101* should not attempt an equivalency submittal preparation using NFPA 101A.** Each equivalency submittal needs to be evaluated, via careful scrutiny of the AHJ, with due consideration of the preparer's credentials.

7.4.2.1

The provision of 7.4.2.1 directs the user to evaluate the large facility as a whole or on a zone by zone basis. Further, portions of the building not related to the residential board and care occupancy are permitted to be omitted from the evaluation. See the detailed text of 7.4.2.1 and 7.4.2.2.

7.4.3

The provision of 7.4.3 makes clear that the presence of a building feature or system does not, by itself, provide positive credit in the evaluation. Such feature or system needs to be maintained in order to receive credit contributing toward the equivalency. For example, where a manual fire

alarm system without fire department notification is present but not maintained, Safety Parameter 3 of Worksheet 7.5.2 would be scored with a value of 0, rather than a value of 2.

7.4.4.1

The text associated with scoring Safety Parameter 1, "Construction," of Worksheet 7.5.2 appears in 7.4.4.1 through 7.4.4.1.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 1, is reflected in the fourth position of the related text paragraph numbers, in this case 7.4.4.1. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

To score Safety Parameter 1, "Construction," of Worksheet 7.5.2, the user needs to be familiar with the building construction type notations as used in NFPA *101* and as explained further in NFPA *101* Table A.8.2.1.2. The user also needs to be familiar with determining number of stories in height as addressed in the text of 7.4.4.1.1, which references the use of NFPA *101* 4.6.3.

The provision of 7.4.4.1.2 is consistent in concept with that expressed in NFPA *101* 8.2.1.3. The term *additions or connected structures* is meant to apply to sections of the building that sit side-by-side, and not the condition where floors of a given construction type are stacked atop floors of a different construction type. NFPA *101* 8.2.1.3 clarifies the issue by referring to the separating barrier between the differing construction types as a vertically aligned fire barrier.

Note *a* to Worksheet 7.5.2 tempers the negative values applied to existing buildings of unprotected construction type (i.e., those with zero fire resistance rating for structural frame and floors) where the building is sheathed with plaster or gypsum wallboard. Further, the note caps the negative score at not less than a value of -2 where the building is protected throughout by automatic sprinklers. Where Note *a* is applied, the applicable value must be calculated, entered into the parentheses, and circled.

Note *q* to Worksheet 7.5.2 awards a value of zero, rather than a negative number, where the building is protected throughout by automatic sprinklers.

Note *s* to Worksheet 7.5.2 awards a value of zero, rather than a negative number, where the building is protected throughout by quick-response automatic sprinklers.

7.4.4.2

The text associated with scoring Safety Parameter 2, "Hazardous Areas," of Worksheet 7.5.2 appears in 7.4.4.2 through 7.4.4.2.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 2, is reflected in the fourth position of the related text paragraph numbers, in this case 7.4.4.2. The consistent numbering scheme lends ease to moving between the worksheet and the related text. Note, too, that the assignment of safety parameter values for hazardous areas is a four-step process.

7.4.4.2.1

The provision of 7.4.4.2.1 Step 1 does not send the user to NFPA *101* 32.3.3.2, 33.3.3.2, or Section 8.7 to determine hazardous areas. Rather, the NFPA 101A user is asked to identify storage or other activities that have a degree of hazard greater than that normal to the general occupancy of the building.

The user is asked to analyze hazardous areas to a greater degree than that to which they are addressed in NFPA *101* 32.3.3.2 and 33.3.3.2.

7.4.4.2.2

The text of 7.4.4.2.2.1 and 7.4.4.2.2.2 helps the user determine whether the hazard identified in Step 1 is structurally endangering or not structurally endangering.

7.4.4.2.3

The text of 7.4.4.2.3.1 provides the guidance needed to determine the level of fire protection provided, whether protection by sprinklers, protection by fire-rated barriers, or protection by both sprinklers and fire-rated barriers.

7.4.4.2.4

Table 7.4.4.2.4 is used to determine the degree of deficiency. The resulting degree of deficiency might be that of a double deficiency, single deficiency, or no deficiency. After determining the degree of deficiency, the user goes to Safety Parameter 2 of Worksheet 7.5.2, where the results of having performed Step 3 and Step 4 lead to scoring the safety parameter.

Where a double deficiency exists and the hazardous area is within the bedroom areas or along the egress route, the parameter is scored as *NP*. A footnote to Worksheet 7.5.2 advises that a score of *NP* voids the FSES equivalency evaluation. The process stops as the system is not able to measure fire safety where such condition exists. The user can correct the situation (e.g., install sprinklers within the hazardous area or isolate the hazardous area from the remainder of the floor by fire-rated construction) such that nothing worse than a single deficiency exists and, then, begin the FSES equivalency evaluation anew.

Note *b* to Worksheet 7.5.2 decreases the score significantly if the building is of an unprotected construction type (i.e., those with zero fire resistance rating for structural frame and floors), the building is not sheathed with plaster or gypsum wallboard, and the building does not have sprinklered corridors and common spaces.

Note *t* to Worksheet 7.5.2 decreases the score by one point where the fire-rated hazardous separation barriers are not also smoke partitions in an impractical evacuation capability facility.

7.4.4.3

The text associated with scoring Safety Parameter 3, "Manual Fire Alarm," of Worksheet 7.5.2 appears in 7.4.4.3 through 7.4.4.3.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 3, is reflected in the fourth position of the related text paragraph number, in this case 7.4.4.3. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The consideration related to Safety Parameter 3, "Manual Fire Alarm," involves first determining whether a manual fire alarm system is provided. If such manual fire alarm system is provided, the user next needs to determine the degree to which fire department notification is provided.

Note *f* to Worksheet 7.5.2 awards credit for a manual fire alarm system in an existing building that has no fire alarm system, provided the building is not more than three stories in height, each sleeping room has a direct exit to the outside, and the residents are not of impractical evacuation capability.

7.4.4.4

The text associated with scoring Safety Parameter 4, "Smoke Detection and Alarm," of Worksheet 7.5.2 appears in 7.4.4.4 through 7.4.4.4.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 4, is reflected in the fourth position of the related text paragraph number, in this case 7.4.4.4. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The consideration related to Safety Parameter 4, "Smoke Detection and Alarm," is one of determining to what degree smoke, in various areas of the facility, will be automatically detected so that residents will receive early notification of the smoky condition.

Note *i* to Worksheet 7.5.2 provides a definition of interconnected system. See also the text of 7.4.4.4.3.

Note *e* to Worksheet 7.5.2 lowers the score where the maximum extent of sprinkler installation involves corridors and common spaces and there is little or no separation between resident sleeping rooms and corridors.

Note *j* to Worksheet 7.5.2 cancels the -10 point penalty for the absence of a smoke detection system where the bedrooms, corridors, and common spaces are sprinklered.

Note *p* to Worksheet 7.5.2 equates the presence of quick-response sprinklers with the early warning provided by smoke detection in areas remote from where the residents sleep, but the credit given is dependent on the presence of smoke detection within the sleeping rooms, corridors, and common spaces to warn residents of a smoky condition within their immediate egress path. The alarm notification from sprinkler water flow will not occur until the sprinkler senses sufficient heat. A smoldering fire can generate untenable levels of smoke before a sprinkler will operate; thus, the credit relies on partial smoke detection being provided.

7.4.4.5

The text associated with scoring Safety Parameter 5, "Automatic Sprinklers," of Worksheet 7.5.2 appears in 7.4.4.5 through 7.4.4.5.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 5, is reflected in the fourth position of the related text paragraph numbers, in this case 7.4.4.5. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *c* to Worksheet 7.5.2 lowers the score for partial sprinkler systems where the building is of an unprotected construction type (i.e., those buildings with zero fire resistance rating for structural frame and floors).

7.4.4.6

The text associated with scoring Safety Parameter 6, "Separation of Sleeping Rooms from Exit Access," of Worksheet 7.5.2 appears in 7.4.4.6 through 7.4.4.6.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 6, is reflected in the fourth position of the related text paragraph numbers, in this case 7.4.4.6. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 6, "Separation of Sleeping Rooms from Exit Access," of Worksheet 7.5.2 is scored using a three-step approach. First, the user determines whether there are corridor walls to separate the sleeping rooms from the exit access corridor or similar route to an exit. If *no,* the user works at the left side of the Parameter 6 row in the category of *None or Incomplete*. If *yes,* the user next addresses the expectation of whether the room door will be closed at time of fire. If the expectation of door closing is *Not High*, the user works within the center of the row and differentiates between smoke-resisting corridor walls and fire-rated corridor walls and doors. If the expectation of door closing is *High*, the user works at the right side of the row and differentiates among smoke-resisting corridor walls and two categories of fire-rated corridor walls and doors.

Note *g* to Table 7.5.2 awards fire-rated wall and door credit or smoke-resisting door credit where the existing walls are not fire rated or smoke resisting but partial sprinkler protection is provided.

Note *r* to Table 7.5.2 awards fire-rated wall and door credit where the new walls are not fire rated but quick-response sprinkler protection is provided throughout the building.

Note *k* to Table 7.5.2 awards an extra point where the expectation of door closing is not high, but the occupants of the bedroom have control of the security lock on their room door. Doors are typically kept closed in such situation even if the door is not equipped with a self-closing or automatic-closing device.

Note *l* to Table 7.5.2 raises the score by one point where the separation from bedroom to bedroom has the same fire rating as the corridor wall.

7.4.4.7

The text associated with scoring Safety Parameter 7, "Exit System," of Worksheet 7.5.2 appears in 7.4.4.7 through 7.4.7.7.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 7, is reflected in the fourth position of the related text paragraph numbers, in this case 7.4.4.7. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The text for Safety Parameter 7, "Exit System," of Worksheet 7.5.2 is extensive and includes 7.4.4.7 through 7.4.4.7.7.2. The explanation is quite detailed and leaves little need for additional annotated text. The user should continue reading through all of the associated text of 7.4.4.7 even if it appears that an early paragraph provides the needed information. With full knowledge of all the options for scoring the exit system (i.e., paths of travel to the outside or to a point of safety within the facility), the user can feel confident that nothing was overlooked and useful text was not abandoned prematurely.

Note *m* to Worksheet 7.5.2 tempers the score for an existing, prompt evacuation capability, maximum two-story building with a single route, exposed route, or deficient multiple routes where access to the exterior can be made without traversing a corridor or other space that is exposed to an unprotected vertical opening.

7.4.4.8

The text associated with scoring Safety Parameter 8, "Exit Access," of Worksheet 7.5.2 appears in 7.4.4.8. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 8, is reflected in the fourth position of the related text paragraph numbers, in this case 7.4.4.8. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 8, "Exit Access," of Worksheet 7.5.2 is scored using a two-step approach. First, the user determines whether there are any dead-end corridors in excess of 30 ft (9.1 m). If *yes*, the user works in the two columns toward the left of the table (i.e., those grouped under

the heading *Max. Dead End*) and scores the value based on the longest dead-end corridor. If *no*, the user works in the four columns at the right of the table and scores the value based on the travel distance.

Note *d* to Worksheet 7.5.2 tempers the penalty assessed for excessive dead-end corridors where Safety Parameter 7, "Exit System," was scored as -6 based on no corridor walls or incomplete corridor walls. If the score were not tempered, the combined effect of the negative scores on Safety Parameter 7 and Safety Parameter 8 would unfairly penalize the facility.

7.4.4.9

The text associated with scoring Safety Parameter 9, "Interior Finish," of Worksheet 7.5.2 appears in 7.4.4.9 through 7.4.4.9.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 9, is reflected in the fourth position of the related text paragraph number, in this case 7.4.4.9. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note that the interior finish consideration, required for scoring Safety Parameter 9 of Worksheet 7.5.2, includes both interior wall finish and interior ceiling finish. Walls and ceilings are grouped into the category of *interior wall and ceiling finish* as used in NFPA *101* 10.2.3.

In scoring any safety parameter of Worksheet 7.5.2 it is paramount that the surveyor choose the value associated with what is present. This is particularly important relative to the interior finish safety value. NFPA *101* permits the required interior wall or ceiling classification to be reduced by one category due to the presence of automatic sprinkler protection (e.g., where the *Code* requires nothing inferior to Class B, the presence of sprinklers permits the use of Class C). If the surveyor sees existing Class C interior finish (i.e., flame spread index of between 76 and 200), the surveyor is to circle the safety parameter value for Class C regardless of the presence of sprinklers, not that for Class B. The FSES mandatory values (as addressed in Worksheet 7.5.4A, Worksheet 7.5.4B, Worksheet 7.5.4C, and Worksheet 7.5.4D) are calibrated to provide credit for sprinklers without the surveyor taking credit for the presence of sprinklers relative to the scoring of Safety Parameter 9. This prevents the surveyor from incorrectly taking a double credit.

7.4.4.10

The text associated with scoring Safety Parameter 10, "Vertical Openings," of Worksheet 7.5.2 appears in 7.4.4.10 through 7.4.4.10.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 10, is reflected in the fourth position of the related text paragraph numbers, in this case 7.4.4.10. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 10, "Vertical Openings," of Worksheet 7.5.2 considers all forms of vertical openings, not just those associated with egress routes such as penetrations of exit stair enclosures.

Where Worksheet 7.5.6, Item B, requires the user to evaluate whether the facility's HVAC systems comply with the provisions of NFPA *101* 32.3.6.2 and 33.3.6.2, which reference the use of Section 9.2 requiring compliance with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, such evaluation is made using the requirements of NFPA 90A other than those related to enclosure of vertical openings, as the subject of vertical openings will have already been considered in Safety Parameter 10 of Worksheet 7.5.2.

Note *h* to Worksheet 7.5.2 addresses the case of a one-story building where the subject of vertical openings in not particularly germane. The safety parameter is scored as a value of 0 so as to neither penalize nor unfairly credit the building.

Note *b* to Worksheet 7.5.2 lowers the score from 1 point to 0 if the building is of an unprotected construction type (i.e., those with zero fire resistance rating for structural frame and floors), the building is not sheathed with plaster or gypsum wallboard, and the building does not have sprinklered corridors and common spaces.

7.4.4.11

The text associated with scoring Safety Parameter 11, "Smoke Control," of Worksheet 7.5.2 appears in 7.4.4.11 through 7.4.4.11.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 11, is reflected in the fourth position of the related text paragraph numbers, in this case 7.4.4.11. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *n* to Worksheet 7.5.2 awards the score of 2, associated with smoke barriers, in a facility that has no smoke barriers but for which the travel distance does not exceed the maximum travel distance applicable within a new smoke compartment. See NFPA *101* 32.3.3.7.3.

Note *u* to Worksheet 7.5.2 awards the same score as would be awarded to passive smoke control if smoke partitions are provided in an existing facility but the number of residents sleeping on the story does not exceed the threshold for which NFPA *101* requires smoke barriers. See NFPA *101* 33.3.3.7.8.

7.5

A full set of worksheets — Worksheet 7.5.1 through Worksheet 7.5.7 — must be completed for the large facility or zone of a large facility being evaluated. The NFPA 101A Origin and Development section, printed on page 101A-1, advises that the worksheets are copyrighted by NFPA, but users are permitted to copy them for private use.

7.5.1

Worksheet 7.5.1, Cover Sheet, identifies the large board and care facility and zone, where applicable, being evaluated as well as the evaluator and the date of evaluation.

7.5.2

Worksheet 7.5.2 is employed by circling the value selected for each of the 11 safety parameters. Interspersed in the annotated text are individual explanations of Worksheet 7.5.2 Note *a* through Note *u*.

7.5.3

Each of the 11 circled safety parameter values of Worksheet 7.5.2 is transferred to Worksheet 7.5.3, Individual Safety Evaluations – Large Facility. The word "individual" in the title of the worksheet emphasizes that safety is to be evaluated from multiple perspectives. The four safety evaluations conducted include fire control (S_1), egress (S_2), refuge (S_3), and general fire safety (S_4). Each of the safety parameter values needs to be transferred two, three, or four times to Worksheet 7.5.3 depending on whether the safety parameter contributes to the specific safety evaluation. Where a safety parameter has no effect on a given safety evaluation, the corresponding cell of the worksheet is X-ed out. Note also that multiple safety parameter values are weighted in specific columns so as to have only half the effect that the other applicable safety parameter values have (as indicated by the ÷2= notation) and as explained in the text of subpart (1) to 7.5.3 Step 3.

The arithmetic process of dividing a negative number by 2 is the same as dividing a positive number by 2. For example, (-4)/2 = -2 and (+4)/2 = 2. The intent is that the consideration is to carry only half as much weight — negative or positive — in the evaluation.

Each of the four columns of values in Worksheet 7.5.3 is added. The text of subpart (2) to 7.5.3 Step 3 reminds the user that any negative numbers need to be deducted. The arithmetic exercises produce values for S_1, S_2, S_3, and S_4. Those values are transferred to Worksheet 7.5.5.

7.5.4

The user goes to the applicable worksheet — Worksheet 7.5.4A, Worksheet 7.5.4B, Worksheet 7.5.4C, or Worksheet 7.5.4D — by referencing the title of each worksheet until the correct one is found. The user circles the value in each of four columns based upon the stories in height as determined earlier in Safety Parameter 1, "Construction," of Worksheet 7.5.2.

The mandatory safety requirements values contained in Worksheet 7.5.4A, Worksheet 7.5.4B, Worksheet 7.5.4C, and Worksheet 7.5.4D are calculated by the technical committee responsible for NFPA 101A to reflect a code-compliant situation in accordance with the requirements of NFPA *101*-2012. For a more detailed explanation see the NFPA 101A annex material numbered A.1.3.1.

The mandatory safety requirements values — S_a for fire control, S_b for egress, S_c for refuge, and S_d for general fire safety — are transferred to Worksheet 7.5.5.

7.5.5

The eight labeled boxes in Worksheet 7.5.5 represent values transferred in earlier steps as follows:

1. The values for S_1, S_2, S_3, and S_4 represent individual fire safety evaluation values calculated in Worksheet 7.5.3 and transferred to Worksheet 7.5.5 in Step 3.

2. The values for S_a, S_b, S_c, and S_d represent the mandatory safety requirements values selected from Worksheet 7.5.4A, Worksheet 7.5.4B, Worksheet 7.5.4C, or Worksheet 7.5.4D, and transferred to Worksheet 7.5.5 in Step 4.

The values for the remaining four, unlabeled boxes are calculated by subtracting S_a from S_1, S_b from S_2, S_c from S_3, and S_d from S_4. The user then identifies whether each of the resultants, is greater than, or equal to, zero. The appropriate box for *Yes* or *No* is checked.

7.5.6

Worksheet 7.5.6 is completed. The references in the worksheet are to NFPA *101*. Worksheet 7.5.6 is included as part of the FSES in recognition that the risk/hazard indexing system (see annotated text associated with 1.3.3) employing the safety parameters of Worksheet 7.5.2 does not evaluate all the provisions required by NFPA *101* for *Code* compliance. Those considerations must be considered separately. The combined effect of the equivalency evaluation performed using Worksheet 7.5.1 through Worksheet 7.5.5 and the additional evaluation performed using Worksheet 7.5.6 are addressed, as conclusions, in Worksheet 7.5.7.

7.5.7

For the 2013 edition of NFPA 101A, Worksheet 7.5.7 was revised to formalize the process of concluding whether equivalency has been achieved by taking into account both the equivalency evaluation performed using Worksheets 7.5.1 through 7.5.5 and the additional evaluation performed using Worksheet 7.5.6. Revised Worksheet 7.7.7, Conclusions, requires mitigation of the consideration checked as *Not Met* in Worksheet 7.5.6 before the large facility can be judged to provide fire and life safety equivalent to that prescribed in NFPA *101*.

(FIGURE 7.5) Worksheet 7.5.2 Safety Parameter Values

It is important that the user of the Chapter 7 FSES for large facilities not attempt to score the parameter values of Worksheet 7.5.2 without consulting the associated text in 7.4 through 7.4.4.11.5. Those paragraphs are accompanied by significant annotated text on how to use the worksheet, including Note *a* through Note *u*.

For ease in moving between Worksheet 7.5.2 and the detailed text, note the correlative numbering scheme employed where the safety parameter number appears in the fourth position of the associated text paragraph number. The numbering scheme is illustrated in Exhibit 24.

Safety Parameter No.	Parameter Heading	Associated Text
1	Construction	7.4.4.**1**
2	Hazardous areas	7.4.4.**2**
3	Manual fire alarm	7.4.4.**3**
4	Smoke detection and alarm	7.4.4.**4**
5	Automatic sprinklers	7.4.4.**5**
6	Separation of sleeping rooms from exit access	7.4.4.**6**
7	Exit system	7.4.4.**7**
8	Exit access	7.4.4.**8**
9	Interior finish	7.4.4.**9**
10	Vertical openings	7.4.4.**10**
11	Smoke control	7.4.4.**11**

Exhibit 24 Correlative numbering between safety parameter number and associated text for large facilities.

7.6

NFPA *101* Section 32.4 and Section 33.4 address the suitability of an apartment building to house a board and care occupancy. NFPA 101A Section 7.6 and Section 7.7 provide tools, in the form of a fire safety evaluation system (FSES), for determining the suitability of an apartment building to house a board and care occupancy. The FSES is the third subsystem presented in Chapter 7 for board and care occupancies. Detailed annotated text on the use of the FSES is not included as it follows the same format detailed in the FSES for small facilities in Section 7.2 and Section 7.3 and in the FSES for large facilities detailed in Section 7.4 and Section 7.5.

Once the apartment building is determined to be suitable to house a board and care occupancy, each individual apartment unit housing such board and care occupancy is required to meet the provisions for small board and care facilities as detailed in NFPA *101* Section 32.2 and Section 33.2. This is dictated by NFPA *101* 32.4.1.2 and 33.4.1.2. Where the individual apartment unit housing the board and care occupancy is not compliant with the provisions of NFPA *101* Section 32.2 or Section 33.2, the FSES for small board and care facilities, as detailed in NFPA 101A Section 7.2 and Section 7.3, can be utilized to evaluate equivalency. In other words, the FSES subsystems in Chapter 7 can be utilized twice — once to evaluate the suitability of the apartment building to house the board and care occupancy and once to evaluate the fire safety of any individual apartment unit used as a board and care occupancy.

Chapter 8

Chapter 8 presents the fourth of five fire safety evaluation systems (FSESs). Each FSES applies to a specific occupancy. Each FSES provides a formalized method or tool for measuring the level of life safety against that required by NFPA *101*-2012, *Life Safety Code*, for use in an equivalency submittal to the authority having jurisdiction (AHJ).

Chapter 8 applies only to business occupancies as addressed in NFPA *101* Chapter 38, New Business Occupancies, and Chapter 39, Existing Business Occupancies. The business occupancies FSES does not measure equivalent life safety against the provisions of Chapter 20, New Ambulatory Health Care Occupancies, and Chapter 21, Existing Ambulatory Health Care Occupancies. Similarly, as explained in the annotated text that accompanies the title of Chapter 4 of this guide, the health care occupancies FSES does not measure equivalent life safety against the provisions of Chapter 20, New Ambulatory Health Care Occupancies, and Chapter 21, Existing Ambulatory Health Care Occupancies.

8.1.1

NFPA 101A is unique in that, although it is a guide, the chapters presenting FSES utilize the word *shall*. The context in which the business occupancies FSES is written in mandatory language is explained in the second sentence of 8.1.1.

8.1.2

NFPA *101* applies both to new construction and to existing buildings. Where a new business occupancy is compliant with the requirements of NFPA *101* Chapter 38 for new business occupancies, there is no need to utilize NFPA 101A Chapter 8. Similarly, where an existing business occupancy is compliant with the requirements of NFPA *101* Chapter 39 for existing business occupancies, there is no need to utilize NFPA 101A Chapter 8. The user of NFPA *101* Chapter 38 or 39 might employ NFPA 101A where the facility is not compliant with the requirements of the applicable chapters of NFPA *101* and an equivalency submittal is to be prepared for submittal to the AHJ.

NFPA 101A presents a formalized method for preparing an equivalency submittal, for business occupancies, in accordance with the equivalency concept permitted by NFPA *101* Section 1.4, which reads as follows:

> **1.4* Equivalency.** Nothing in this *Code* is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this *Code*.
>
> **1.4.1 Technical Documentation.** Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.
>
> **1.4.2 Approval.** The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.4.3* Equivalent Compliance. Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this *Code*.

Once the AHJ approves an NFPA 101A equivalency submittal as providing a facility with life safety that, *in toto,* is equivalent to that provided by compliance with all applicable provisions of NFPA *101,* such facility is deemed to comply with NFPA *101* as stated above in the text from NFPA *101* 1.4.3. However, such equivalency is relative to compliance with the provisions of a specific edition of NFPA *101*. Where a jurisdiction adopts a newer edition of NFPA *101*, the equivalency submittal will need to be conducted anew, utilizing the applicable editions of NFPA *101* and NFPA 101A. For example, in a jurisdiction that enforces the 2000 edition of NFPA *101*, an equivalency submittal is prepared using the 2001 edition of NFPA 101A. The jurisdiction then updates to the 2012 edition of NFPA *101* and a new equivalency submittal is prepared using the 2013 edition of NFPA 101A.

As an example of the case cited in the previous paragraph, at the time a business occupancy equivalency submittal was prepared for an existing office building per NFPA 101A-2001, the office building was subject to the requirements of NFPA *101*-2000 for an existing business occupancy. The NFPA 101A FSES mandatory values used for the office building were those applicable to existing business occupancies. In 2013 the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used for the existing office building are those applicable to existing business occupancies. The new equivalency submittal reflects that the NFPA *101* requirements applicable to existing business occupancies might have changed between the 2000 and 2012 editions.

As another example, at the time a business occupancy equivalency submittal was prepared for an office building per NFPA 101A-2001, the office building was new and subject to the requirements of NFPA *101*-2000 for a new business occupancy. The NFPA 101A FSES mandatory values used for the office building were those applicable to new business occupancies. In 2013 the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used, for what has become an existing office building, are those applicable to existing business occupancies. Some might argue that the business occupancy is being held to a lesser level of scrutiny given that it is to be evaluated via the provisions applicable to existing buildings, which typically are less stringent than those applied to new construction. They are concerned that the new equivalency submittal, based on the mandatory values of NFPA 101A applicable to existing business occupancies, will permit life safety features to go unrecognized that were abandoned, or not otherwise maintained, in the years between equivalency submittals. Given that NFPA *101* and NFPA 101A are to be used together, such situation is avoided because the AHJ will enforce the following provision of NFPA *101*-2012:

4.6.12.2 No existing life safety feature shall be removed or reduced where such feature is a requirement for new construction.

8.2.1

The FSES is more than the forms presented in Worksheet 8.6.1 through Worksheet 8.6.7. The four pages of forms are supplemented by seven pages of text detailing, mainly, the considerations requiring attention for purposes of completing Worksheet 8.6.2 related to safety parameter values. In addition to the forms and detailed text of 8.2 through 8.6.6, the NFPA 101A user needs a well-based foundation in the use of NFPA *101* Chapters 38 and 39, and related core Chapters 1 through 11. **Note that persons without experience in the use of NFPA *101* should not attempt an equivalency submittal preparation using NFPA 101A.** Each equivalency submittal needs to be evaluated, via careful scrutiny of the AHJ, with due consideration of the preparer's credentials.

8.3.2.1

The provision of 8.3.2.1 directs the user to evaluate either each fire zone or the entire facility as a whole. The direction is different from that provided in the health care occupancies FSES of Chapter 4, where zones are identified and each zone is required to be evaluated separately. The text of 8.2.1.1 through 8.2.1.3 on zoning provides additional guidance. The text of 8.3.2.1.1 through 8.3.2.1.4 assists the user in determining what conditions in adjoining zones need to be made part of the analysis of the zone in question.

8.4

The provision of Section 8.4 makes clear that the presence of a building feature or system does not, by itself, provide positive credit in the evaluation. Such feature or system needs to be maintained in order to receive credit contributing toward the equivalency. For example, where a manual fire alarm system without emergency forces notification and without voice communication is present but not maintained, Safety Parameter 5 of Worksheet 8.6.2 would be scored with a value of 0, rather than a value of 1.

8.5.1

The text associated with scoring Safety Parameter 1, "Construction," of Worksheet 8.6.2 appears in 8.5.1. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 1, is reflected in the third position of the related text paragraph numbers, in this case 8.5.1. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

To score Safety Parameter 1, "Construction," of Worksheet 8.6.2, the user needs to be familiar with the building construction type notations as used in NFPA *101* and as explained further in NFPA *101* Table A.8.2.1.2. Note that there are no minimum construction requirements in NFPA *101* 38.1.6 and 39.1.6. The authors of the FSES felt that a balanced FSES would not measure equivalent life safety if it did not address construction. Thus, the FSES contains a safety parameter consideration — construction — that is not a requirement of NFPA *101*.

The provision of 8.5.1 is consistent in concept with that expressed in NFPA *101* 8.2.1.3. The term *additions or connected structures* is meant to apply to sections of the building that sit side-by-side, and not the condition where floors of a given construction type are stacked atop floors of a different construction type. NFPA *101* 8.2.1.3 clarifies the issue by referring to the separating barrier between the differing construction types as a vertically aligned fire barrier.

The provision of 8.5.1 applies the building construction type consideration based on number of stories in height. In the case of a four-story building, for example, where business occupancies occupy only floor 1 and floor 2, Safety Parameter 1 is scored based on the values in the row labeled "1-2 Stories."

The *NV* entries Safety Parameter 1 of Worksheet 8.6.2 are explained in a footnote to the worksheet. Upon encountering an *NV* parameter value, the NFPA 101A evaluation is halted. Other means for judging equivalency must be used as the NFPA 101A evaluation system is unable to evaluate overall safety. For example, a Type II(000) unprotected steel frame building more than five stories in height presents too great a potential for collapse in a fire for the FSES to permit construction to be traded off for non-construction related features that might be installed in excess of code requirements.

8.5.2

The text associated with scoring Safety Parameter 2, "Segregation of Hazards," of Worksheet 8.6.2 appears in 8.5.2 through 8.5.2.4.3.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 2, is reflected in the third position of the related text paragraph numbers, in this case 8.5.2. The consistent numbering scheme lends ease to moving between the worksheet and the related text. Note, too, that the assignment of charges for unsegregated hazardous areas is a four-step process.

8.5.2.1

The provision of 8.5.2.1 does not send the user to NFPA *101* 38.3.2, 39.3.2, or Section 8.7 to determine hazardous areas. Rather, the NFPA 101A user is asked to identify storage or other activities that are not part of the normal office arrangement and that possess the potential for producing a fully involved fire.

The user is asked to analyze hazardous areas to a greater degree than that to which they are addressed in NFPA *101* 38.3.2 and 39.3.2.

8.5.2.2

The text of 8.5.2.2.1 through 8.5.2.2.1.2 helps the user determine whether the hazard identified in Step 1 is structurally endangering or not structurally endangering. See the example in 8.5.2.2.2.

8.5.2.3

The text of 8.5.2.3.1 provides the only guidance as to what constitutes the category of *Exposed Exit System* and the category of *Segregation from Exit Routes* as used in Safety Parameter 2 of Worksheet 8.6.2. If there are at least smoke-resistant partitions and doors separating the hazardous area from the occupied areas and egress routes, the category of *Segregation from Exit Routes* can be elected. If there are no smoke-resistant partitions and doors to separate the hazardous area from the occupied areas and egress routes, the category of *Exposed Exit System* must be elected.

8.5.2.4

Table 8.5.2.4.1 is used to determine the degree of deficiency. The resulting degree of deficiency might be that of a double deficiency, single deficiency, or no deficiency. After determining the degree of deficiency, the user goes to Safety Parameter 2 of Worksheet 8.6.2, where the results of having performed Step 3 and Step 4 lead to scoring the safety parameter.

8.5.3

The text associated with scoring Safety Parameter 3, "Vertical Openings," of Worksheet 8.6.2 appears in 8.5.3 through 8.5.3.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 3, is reflected in the third position of the related text paragraph numbers, in this case 8.5.3. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 3, "Vertical Openings," of Worksheet 8.6.2 considers all forms of vertical openings, not just those associated with egress routes such as penetrations of exit stair enclosures.

Where Worksheet 8.6.6, Item B, requires the user to evaluate whether the facility's HVAC systems comply with the provisions of NFPA *101* Section 9.2, which require compliance with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* such evaluation is made using the requirements of NFPA 90A other than those related to enclosure of vertical openings, as the subject of vertical openings will have already been considered in Safety Parameter 3 of Worksheet 8.6.2.

Note *a* to Worksheet 8.6.2 prevents the user from unfairly scoring a positive safety parameter value where shafts are fire resistance rated in a one-story building. The concept recognizes that a one-story building is evaluated less harshly than multi-story buildings, so the evaluation system should not credit a shaft system that does little to protect the floor.

Note *g* to Worksheet 8.6.2 emphasizes that a safety parameter value of 1 is to be scored only where multiple features and requirements are met.

8.5.4

The text associated with scoring Safety Parameter 4, "Sprinklers," of Worksheet 8.6.2 appears in 8.5.4 through 8.5.4.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 4, is reflected in the third position of the related text paragraph numbers, in this case 8.5.4. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Where Safety Parameter 4, "Sprinklers," of Worksheet 8.6.2 uses the term *fast response*, it is referring to sprinklers that use the quick-response technology.

8.5.5

The text associated with scoring Safety Parameter 5, "Fire Alarm," of Worksheet 8.6.2 appears in 8.5.5 through 8.5.5.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 5, is reflected in the third position of the related text paragraph number, in this case 8.5.4. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The consideration related to Safety Parameter 5, "Fire Alarm," involves first determining whether a manual fire alarm system that meets the requirements of NFPA *101* Section 9.6 is provided. If such manual fire alarm system is provided, the user next needs to determine whether the fire alarm system is provided with fire department notification, as might be accomplished via an approved central station connection. See NFPA *101* 9.6.4.2. Lastly, the user determines whether occupant notification is accomplished via voice communication as opposed to horns or bells.

Note *k* to Worksheet 8.6.2 forces the Safety Parameter 2 score to be decreased under the same conditions that NFPA *101* uses as the thresholds for requiring a fire alarm system.

Note *p* to Worksheet 8.6.2 forces the Safety Parameter 2 score to be decreased for new high-rise buildings, because NFPA *101* requires new high-rise buildings to be provided with occupant notification using voice communication.

8.5.6

The text associated with scoring Safety Parameter 6, "Smoke Detection," of Worksheet 8.6.2 appears in 8.5.6 through 8.5.6.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 6, is reflected in the third position of the related text paragraph numbers, in this case 8.5.6. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

8.5.7

The text associated with scoring Safety Parameter 7, "Interior Finish," of Worksheet 8.6.2 appears in 8.5.7 through 8.5.7.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 7, is reflected in the third position of the related text paragraph number, in this case 8.5.7. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note that the interior finish consideration, required for scoring Safety Parameter 7 of Worksheet 8.6.2, includes both interior wall finish and interior ceiling finish. Walls and ceilings are grouped into the category of *interior wall and ceiling finish* as used in NFPA *101* 10.2.3.

The text of 8.5.7.4 instructs the user to score the interior finish parameter based on a combination of the flame spread index noted in the survey and the presence of sprinklers in recognition that NFPA *101* permits the required interior wall or ceiling classification to be reduced by one category due to the presence of automatic sprinkler protection (e.g., where the *Code* requires nothing inferior to Class B, the presence of sprinklers permits the use of Class C). If the surveyor sees existing Class C interior finish (i.e., flame spread index of between 76 and 200), the surveyor is to score the parameter as not exceeding a flame spread index of 75 where sprinklers are present. Note *b* to Worksheet 8.6.2 repeats the guideline.

8.5.8

The text associated with scoring Safety Parameter 8, "Smoke Control," of Worksheet 8.6.2 appears in 8.5.8 through 8.5.8.2.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 8, is reflected in the third position of the related text paragraph numbers, in this case 8.5.8. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

8.5.9

The text associated with scoring Safety Parameter 9, "Exit Access," of Worksheet 8.6.2 appears in 8.5.9 through 8.5.9.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 9, is reflected in the third position of the related text paragraph numbers, in this case 8.5.9. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 9, "Exit Access," of Worksheet 8.6.2 is scored using a two-step approach. First, the user determines whether there are any dead-end corridors in excess of 50 ft (15 m). If *yes*, the user works in the two columns at the center of the table (i.e., those grouped under the heading *Max. Dead Ends*) and scores the value based on the longest dead-end corridor. If *no*, the user works in the four columns at the right of the table and scores the value based on the travel distance.

Where dead-end corridors are not excessive and Safety Parameter 9 is scored based on travel distance, Note *c* to Worksheet 8.6.2 permits the 200 ft (61 m) category to be changed to 300 ft (91 m) in fully sprinklered buildings in recognition that NFPA *101* 38.2.6 and 39.2.6 permit the same 100 ft (30 m) increase due to the presence of sprinklers.

Note *d* to Worksheet 8.6.2 tempers the -2 score associated with long dead-end corridors where the facility is penalized in Safety Parameter 11 for having incomplete corridor/room separation. The combined effect of scoring Safety Parameter 9 as a value of -2 and Safety Parameter 11 as a value of -6 is too much of a penalty.

Note *h* to Worksheet 8.6.2 repeats the information provided by the text of 8.5.9.3 relative to the maximum dead-end corridor limitations being different for new construction than for existing situations.

8.5.10

The text associated with scoring Safety Parameter 10, "Egress Route," of Worksheet 8.6.2 appears in 8.5.10 through 8.5.10.2.5. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 10, is reflected in the third position of the related text paragraph numbers, in this case 8.5.10. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *i* to Worksheet 8.6.2 recognizes that a penalty should not be scored where NFPA *101* permits a single means of egress for business occupancies.

8.5.11

The text associated with scoring Safety Parameter 11, "Corridor/Room Separation," of Worksheet 8.6.2 appears in 8.5.11 through 8.5.11.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 11, is reflected in the third position of the related text paragraph numbers, in this case 8.5.11. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *e* to Worksheet 8.6.2 credits a non-fire-rated corridor partition as having fire resistance rating where the building is sprinklered, in recognition that NFPA *101* 38.3.6 exempts the 1-hour fire resistance–rated corridor partition requirement in sprinklered buildings.

Note *f* to Worksheet 8.6.2 raises the score by one point where the partitions separating rooms from each other provide the same level of protection as that provided by the corridor partitions.

Note *l* to Worksheet 8.6.2 refers the user to the text of 8.5.11.1.1 for scoring Parameter 11 where the corridor separation is incomplete. The text is important as the score chosen can be anywhere in the range of -6 to 0. The user needs to pick an appropriate value from that range after consulting Figure 8.5.11.1.1.2 and Table 8.5.11.1.1.2, which appear on the page following the text of 8.5.11.1.1.1 and 8.5.11.1.1.2.

8.5.12

The text associated with scoring Safety Parameter 12, "Occupant Emergency Program," of Worksheet 8.6.2 appears in 8.5.12 through 8.5.12.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 12, is reflected in the third position of the related text paragraph numbers, in this case 8.5.12. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *m* to Worksheet 8.6.2 reduces the score related to the conduct of fire drills for buildings that are significantly high-rise in nature and for which no formal occupant emergency program exists.

Note *n* to Worksheet 8.6.2 raises the score related to the conduct of fire drills where a formal occupant emergency program exists.

8.6

A full set of worksheets — Worksheet 8.6.1 through Worksheet 8.6.7 — must be completed for the building being evaluated, or for any zone evaluated separately as permitted by 8.3.2.1. The NFPA 101A Origin and Development section, printed on page 101A-1, advises that the worksheets are copyrighted by NFPA, but users are permitted to copy them for private use.

8.6.1

Worksheet 8.6.1, Cover Sheet, identifies the facility being evaluated as well as the evaluator and the date of evaluation.

8.6.2

Worksheet 8.6.2 is employed by circling the value selected for each of the twelve safety parameters. In Safety Parameter 11, "Corridor/Room Separation," where the condition of *Incomplete* is noted, rather than circling a value, the user must chose a value in the range of -6 to 0 and then enter the value chosen. See the text, and associated annotations, in 8.5 through 8.5.12.3. Interspersed in the annotated text are individual explanations of Worksheet 8.6.2 Note *a* through

Note *p*.

Each of the twelve circled safety parameter values of Worksheet 8.6.2 is transferred to Worksheet 8.6.3, Individual Safety Evaluation. The word "individual" in the title of the worksheet emphasizes that safety is to be evaluated from multiple perspectives. The three safety evaluations conducted include fire control (S_1), egress (S_2), and general fire safety (S_3). Each of the safety parameter values needs to be transferred two or three times to Worksheet 8.6.3 depending on whether the safety parameter contributes to the specific safety evaluation. Where a safety parameter has no effect on a given safety evaluation, the corresponding cell of the worksheet is X-ed out. Note also that multiple safety parameter values are weighted in specific columns so as to have only half the effect that the other applicable safety parameter values have (as indicated by the ÷2= notation) and as explained in the text of 8.6.2(2).

The arithmetic process of dividing a negative number by 2 is the same as dividing a positive number by 2. For example, (-4)/2 = -2 and (+4)/2 = 2. The intent is that the consideration is to carry only half as much weight — negative or positive — in the evaluation.

Each of the three columns of values in Worksheet 8.6.3 is added. The text of 8.6.2(3) reminds the user that any negative numbers need to be deducted. The arithmetic exercises produce values for S_1, S_2, and S_3. Those values are transferred to Worksheet 8.6.5.

8.6.3

The user goes to Worksheet 8.6.4, Mandatory Safety Requirements, and circles the appropriate value in each of three columns identified based upon stories in height (as addressed previously in Safety Parameter 1, "Construction," and in the text of 8.5.1 and its associated annotated text) and whether the equivalency analysis is being applied to new construction or to an existing situation.

The mandatory safety requirements values contained in Worksheet 8.6.4 are calculated by the technical committee responsible for NFPA 101A to reflect a code-compliant situation in accordance with the requirements of NFPA *101*-2012. For a more detailed explanation see the NFPA 101A annex material numbered A.1.3.1.

The mandatory safety requirements values — S_a for fire control, S_b for egress, and S_c for general fire safety — are transferred to Worksheet 8.6.5.

8.6.4

Six of the twelve boxes in Worksheet 8.6.4 represent values transferred in earlier steps as follows:

1. The values for S_1, S_2, and S_3 represent individual fire safety evaluation values calculated in Worksheet 8.6.3 and transferred to Worksheet 8.6.5 in Step 2.
2. The values for S_a, S_b, *and* S_c represent the mandatory safety requirements values selected from Worksheet 8.6.4 and transferred to Worksheet 8.6.5 in Step 3.

The values for the remaining three, unlabeled boxes are calculated by subtracting S_a from S_1, S_b from S_2, and S_c from S_3. The user then identifies whether each of the resultants is greater than, or equal to, zero. The appropriate box for *Yes* or *No* is checked.

8.6.5

Worksheet 8.6.6 is completed. All references in the worksheet are to NFPA *101*. Worksheet 8.6.6 is included as part of the FSES in recognition that the risk/hazard indexing system (see annotated text associated with 1.3.3) employing the safety parameters of Worksheet 8.6.2 does not evaluate some considerations required by NFPA *101* for *Code* compliance. Those considerations must be considered separately. The combined effect of the equivalency evaluation performed using Worksheet 8.6.1 through Worksheet 8.6.5 and the additional evaluation performed using Worksheet 8.6.6 are addressed, as conclusions, in Worksheet 8.6.7.

8.6.6

For the 2013 edition of NFPA 101A, Worksheet 8.6.7 was revised to formalize the process of concluding whether equivalency has been achieved by taking into account both the equivalency evaluation performed using Worksheets 8.6.1 through 8.6.5 and the additional evaluation performed using Worksheet 8.6.6. Revised Worksheet 8.6.7, Conclusions, requires mitigation of any considerations checked as *Not Met* in Worksheet 8.6.6 before the building or zone can be judged to provide fire and life safety equivalent to that prescribed in NFPA *101*.

(FIGURE 8.6) Worksheet 8.6.2 Safety Parameter Values

It is important that the user of the Chapter 8 FSES not attempt to score the parameter values of Worksheet 8.6.2 without consulting the associated text in 8.5 through 8.5.12.3. Those paragraphs are accompanied by significant annotated text on how to use the worksheet, including Note *a* through Note *p*.

For ease in moving between Worksheet 8.6.2 and the detailed text, note the correlative numbering scheme employed where the safety parameter number appears in the third position of the associated text paragraph number. The numbering scheme is illustrated in Exhibit 25.

Safety Parameter No.	Parameter Heading	Associated Text
1	Construction	8.5.**1**
2	Segregation of hazards	8.5.**2**
3	Vertical openings	8.5.**3**
4	Sprinklers	8.5.**4**
5	Fire alarm	8.5.**5**
6	Smoke detection	8.5.**6**
7	Interior finish	8.5.**7**
8	Smoke control	8.5.**8**
9	Exit access	8.5.**9**
10	Egress route	8.5.**10**
11	Corridor/room separation	8.5.**11**
12	Occupant emergency program	8.5.**12**

Exhibit 25 Correlative numbering between safety parameter number and associated text.

Chapter 9

Chapter 9 presents the fifth of five fire safety evaluation systems (FSESs). Each FSES applies to a specific occupancy. Each FSES provides a formalized method or tool for measuring the level of life safety against that required by NFPA *101*-2012, *Life Safety Code*, for use in an equivalency submittal to the authority having jurisdiction (AHJ).

Chapter 9 applies only to educational occupancies as addressed in NFPA *101* Chapter 14, New Educational Occupancies, and Chapter 15, Existing Educational Occupancies.

9.1.1

NFPA 101A is unique in that, although it is a guide, the chapters presenting FSES utilize the word *shall*. The context in which the educational occupancies FSES is written in mandatory language is explained in the second sentence of 9.1.1.

9.1.2

NFPA *101* applies both to new construction and to existing buildings. Where a new educational occupancy is compliant with the requirements of NFPA *101* Chapter 14 for new educational occupancies, there is no need to utilize NFPA 101A Chapter 9. Similarly, where an existing educational occupancy is compliant with the requirements of NFPA *101* Chapter 15 for existing educational occupancies, there is no need to utilize NFPA 101A Chapter 9. The user of NFPA *101* Chapter 14 or Chapter 15 might employ NFPA 101A where the facility is not compliant with the requirements of the applicable chapters of NFPA *101* and an equivalency submittal is to be prepared for submittal to the AHJ.

NFPA 101A presents a formalized method for preparing an equivalency submittal, for educational occupancies, in accordance with the equivalency concept permitted by NFPA *101* Section 1.4, which reads as follows:

1.4* Equivalency. Nothing in this *Code* is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this *Code*.

1.4.1 Technical Documentation. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.4.2 Approval. The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.4.3* Equivalent Compliance. Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this *Code*.

Once the AHJ approves an NFPA 101A equivalency submittal as providing a facility with life safety that, *in toto*, is equivalent to that provided by compliance with all applicable provisions of NFPA *101*, such facility is deemed to comply with NFPA *101* as stated above in the text from NFPA *101* 1.4.3. However, such equivalency is relative to compliance with the provisions of a specific edition of NFPA *101*. Where a jurisdiction adopts a newer edition of NFPA *101*, the equivalency submittal will need to be conducted anew, utilizing the applicable editions of NFPA *101* and NFPA 101A. For example, in a jurisdiction that enforces the 2000 edition of NFPA *101*, an equivalency submittal is prepared using the 2001 edition of NFPA 101A. The jurisdiction then updates to the 2012 edition of NFPA *101* and a new equivalency submittal is prepared using the 2013 edition of NFPA 101A.

As an example of the case cited in the previous paragraph, at the time an educational occupancy equivalency submittal was prepared for an existing school building per NFPA 101A-2001, the school building was subject to the requirements of NFPA *101*-2000 for an existing educational occupancy. The NFPA 101A FSES mandatory values used for the school building were those applicable to existing educational occupancies. In 2013 the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used for the existing school building are those applicable to existing educational occupancies. The new equivalency submittal reflects that the NFPA *101* requirements applicable to existing educational occupancies might have changed between the 2000 and 2012 editions.

As another example, at the time an educational occupancy equivalency submittal was prepared for a school building per NFPA 101A-2001, the school building was new and subject to the requirements of NFPA *101*-2000 for new educational occupancies. The NFPA 101A FSES mandatory values used for the school building were those applicable to new educational occupancies. In 2013 the jurisdiction moves to enforcement of NFPA *101*-2012 and another equivalency submittal is performed using NFPA 101A-2013. The NFPA 101A FSES mandatory values used, for what has become an existing school building, are those applicable to existing educational occupancies. Some might argue that the educational occupancy is being held to a lesser level of scrutiny given that it is to be evaluated via the provisions applicable to existing buildings, which typically are less stringent than those applied to new construction. They are concerned that the new equivalency submittal, based on the mandatory values of NFPA 101A applicable to existing educational occupancies, will permit life safety features to go unrecognized that were abandoned, or not otherwise maintained, in the years between equivalency submittals. Given that NFPA *101* and NFPA 101A are to be used together, such situation is avoided because the AHJ will enforce the following provision of NFPA *101*-2012:

4.6.12.2 No existing life safety feature shall be removed or reduced where such feature is a requirement for new construction.

9.2.1

The FSES is more than the forms presented in Worksheet 9.6.1 through Worksheet 9.6.7. The four pages of forms are supplemented by four pages of text detailing, mainly, the considerations requiring attention for purposes of completing Worksheet 9.6.2 related to safety parameter values. In addition to the forms and detailed text of 9.2 through 9.6.6, the NFPA 101A user needs a well-based foundation in the use of NFPA *101* Chapter 14 and Chapter 15, and related core

Chapters 1 through 11. **Note that persons without experience in the use of NFPA *101* should not attempt an equivalency submittal preparation using NFPA 101A.** Each equivalency submittal needs to be evaluated, via careful scrutiny of the AHJ, with due consideration of the preparer's credentials.

9.3.2.1

The provision of 9.3.2.1 directs the user to evaluate either each fire zone or the entire facility as a whole. The direction is different from that provided in the health care occupancies FSES of Chapter 4, where zones are identified and each zone is required to be evaluated separately. The text of 9.2.1.1 through 9.2.1.3 on zoning provides additional guidance. The text of 9.3.2.1.1 through 9.3.2.1.4 assists the user in determining what conditions in adjoining zones need to be made part of the analysis of the zone in question.

9.4

The provision of Section 9.4 makes clear that the presence of a building feature or system does not, by itself, provide positive credit in the evaluation. Such feature or system needs to be maintained in order to receive credit contributing toward the equivalency. For example, where a manual fire alarm system without any fire detection is present but not maintained, Safety Parameter 5 of Worksheet 9.6.2 would be scored with a value of -6, rather than a value of 0.

9.5.1

The text associated with scoring Safety Parameter 1, "Construction," of Worksheet 9.6.2 appears in 9.5.1. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 1, is reflected in the third position of the related text paragraph numbers, in this case 9.5.1. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

To score Safety Parameter 1, "Construction," of Worksheet 9.6.2, the user needs to be familiar with the building construction type notations as used in NFPA *101* and as explained further in NFPA *101* Table A.8.2.1.2. Note that there are no minimum construction requirements in NFPA *101* 14.1.6 and 15.1.6. The authors of the FSES felt that a balanced FSES would not measure equivalent life safety if it did not address construction. Thus, the FSES contains a safety parameter consideration — construction — that is not a requirement of NFPA *101*.

The provision of 9.5.1 is consistent in concept with that expressed in NFPA *101* 8.2.1.3. The term additions or connected structures is meant to apply to sections of the building that sit side-by-side, and not the condition where floors of a given construction type are stacked atop floors of a different construction type. NFPA *101* 8.2.1.3 clarifies the issue by referring to the separating barrier between the differing construction types as a vertically aligned fire barrier.

The provision of 9.5.1 applies the building construction type consideration based on number of stories in height. In the case of a four-story building, for example, where educational occupancies occupy only floor 1 and floor 2, Safety Parameter 1 is scored based on the values in the row labeled *2 Stories*.

9.5.2

The text associated with scoring Safety Parameter 2, "Segregation of Hazards," of Worksheet 9.6.2 appears in 9.5.2 through 9.5.2.4.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 2, is reflected in the third position of the related text paragraph numbers, in this case 9.5.2. The consistent numbering scheme lends ease to moving between the worksheet and the related text. Note, too, that the assignment of charges for unsegregated hazardous areas is a four-step process.

9.5.2.1

The provision of 9.5.2.1 does not send the user to NFPA *101* 14.3.2, 15.3.2, or Section 8.7 to determine hazardous areas. Rather, the NFPA 101A user is asked to identify storage or other activities that are not part of the normal classroom arrangement and that possess the potential for producing a fully involved fire.

The user is asked to analyze hazardous areas to a greater degree than that to which they are addressed in NFPA *101* 14.3.2 and 15.3.2.

9.5.2.2

The text of 9.5.2.2.1 and 9.5.2.2.2 helps the user determine whether the hazard identified in Step 1 is structurally endangering or not structurally endangering.

9.5.2.3

The text of 9.5.2.3.1 provides the only guidance as to what constitutes the category of *Exposed to Exit System* and the category of *Segregated from Exit Routes* as used in Safety Parameter 2 of Worksheet 9.6.2. If there are at least smoke-resistant partitions and doors separating the hazardous area from the occupied areas and egress routes, the category of *Segregated from Exit Routes* can be elected. If there are no smoke-resistant partitions and doors to separate the hazardous area from the occupied areas and egress routes, the category of *Exposed to Exit System* must be elected.

9.5.2.4

Table 9.5.2.4.1 is used to determine the degree of deficiency. The resulting degree of deficiency might be that of a double deficiency, single deficiency, or no deficiency. After determining the degree of deficiency, the user goes to Safety Parameter 2 of Worksheet 9.6.2 where the results of having performed Step 3 and Step 4 lead to scoring the safety parameter.

9.5.3

The text associated with scoring Safety Parameter 3, "Vertical Openings," of Worksheet 9.6.2 appears in 9.5.3 through 9.5.3.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 3, is reflected in the third position of the related text paragraph numbers, in this case 9.5.3. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 3, "Vertical Openings," of Worksheet 9.6.2 considers all forms of vertical openings, not just those associated with egress routes such as penetrations of exit stair enclosures.

Where Worksheet 9.6.6, Item B, requires the user to evaluate whether the facility's HVAC systems comply with the provisions of NFPA *101* Section 9.2, which require compliance with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, such evaluation is made using the requirements of NFPA 90A other than those related to enclosure of vertical openings, as the subject of vertical openings will have already been considered in Safety Parameter 3 of Worksheet 9.6.2.

Note *a* to Worksheet 9.6.2 addresses the case where an unprotected vertical opening connects only two stories and consists of only the convenience opening addressed in NFPA *101* 8.6.9.1 by increasing the score by a value of 4 points.

Note *b* and Note *c* to Worksheet 9.6.2 lower the score from 2 points to one for existing educational occupancies and existing vertical opening enclosures, respectively. This is done in recognition that the mandatory values of Worksheet 9.6.4 treat existing situations more leniently than new construction. A safety parameter value of 2 would overstate the protection of vertical openings.

Note *d* to Worksheet 9.6.2 lowers the score from 2 points to 1 where the building construction does not include fire-rated floor assemblies [i.e., Type II(000), Type III(200), and Type V(000) construction] in recognition that the non-rated floor presents a quicker path to fire spread from floor to floor than that of a fire-rated shaft.

9.5.4

The text associated with scoring Safety Parameter 4, "Sprinklers," of Worksheet 9.6.2 appears in 9.5.4 through 9.5.4.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 4, is reflected in the third position of the related text paragraph numbers, in this case 9.5.4. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *e* to Worksheet 9.6.2 advises the user not to score the parameter with a value greater than zero unless the sprinkler system is electrically supervised. For guidance on electrical supervision of sprinkler systems, see NFPA *101* 9.7.2.

Note *f* and Note *g* to Worksheet 9.6.2 lower the score for partial sprinklering where sprinkler protection is omitted from levels below the level of exit discharge (LED) as NFPA *101* requires sprinklers in such areas. See NFPA *101* 14.3.5.3 and 15.3.5.1 for sprinkler requirements unique to levels below the LED.

9.5.5

The text associated with scoring Safety Parameter 5, "Detection, Alarm, and Communication," of Worksheet 9.6.2 appears in 9.5.5 through 9.5.5.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 5, is reflected in the third position of the related text paragraph number, in this case 9.5.4. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The consideration related to Safety Parameter 5 involves first determining whether a manual fire alarm system that meets the requirements of NFPA *101* Section 9.6 is provided. If such manual fire alarm system is provided, the user next needs to determine the degree to which automatic detection devices (e.g., heat detectors or smoke detectors) are present. See NFPA *101* 9.6.4.2.

Note *h* to Worksheet 9.6.2 reminds the user to see the text of 9.5.5.2 where an alternative to a manual fire alarm system, as permitted by NFPA *101*, is utilized.

9.5.6

The text associated with scoring Safety Parameter 6, "Emergency Forces Notification," of Worksheet 9.6.2 appears in 9.5.6 through 9.5.6.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 6, is reflected in the third position of the related text paragraph numbers, in this case 9.5.6. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

9.5.7

The text associated with scoring Safety Parameter 7, "Interior Finish in Exits," of Worksheet 9.6.2 appears in 9.5.7 through 9.5.7.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 7, is reflected in the third position of the related text paragraph number, in this case 9.5.7. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note that the interior finish consideration, required for scoring Safety Parameter 7 of Worksheet 9.6.2, includes both interior wall finish and interior ceiling finish. Walls and ceilings are grouped into the category of *interior wall and ceiling finish* as used in NFPA *101* 10.2.3.

The text of 9.5.7.4 instructs the user to score the interior finish parameter based on a combination of the flame spread index noted in the survey and the presence of sprinklers in recognition that NFPA *101* permits the required interior wall or ceiling classification to be reduced by one category due to the presence of automatic sprinkler protection (e.g., where the *Code* requires nothing inferior to Class B, the presence of sprinklers permits the use of Class C). If the surveyor sees existing Class C interior finish (i.e., flame spread index of between 76 and 200), the surveyor is to score the parameter as not exceeding a flame spread index of 75 where sprinklers are present. Note *b* to Worksheet 9.6.2 repeats the guideline.

9.5.8

See annotated text associated with 9.5.7.

9.5.9

See annotated text associated with 9.5.7.

9.5.10

The text associated with scoring Safety Parameter 10, "Exit Access Corridors," of Worksheet 9.6.2 appears in 9.5.10 through 9.5.10.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 10, is reflected in the third position of the related text paragraph numbers, in this case 9.5.10. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Safety Parameter 10, "Exit Access Corridors," of Worksheet 9.6.2 is scored using a two-step approach. First, the user determines whether there are any dead-end corridors in excess of 20 ft (6.1 m) [or 50 ft (15 m) where the building is sprinklered]. If *yes*, the user works in the two columns at the center of the table (i.e., those grouped under the heading *Max. Dead End Length*) and scores the value based on the longest dead-end corridor. If *no*, the user works in the four columns at the right of the table and scores the value based on the travel distance.

Common path of travel is not a consideration affecting the scoring of Safety Parameter 10, "Exit Access Corridors," of Worksheet 9.6.2. The text of 9.5.10.3 advises the user that common paths of travel in excess of that permitted by NFPA *101* are taken into consideration in Safety Parameter 11, "Egress Routes," where such excessive common path of travel results in scoring the egress route as being deficient.

9.5.11

The text associated with scoring Safety Parameter 11, Egress Routes, of Worksheet 9.6.2 appears in 9.5.11 through 9.5.11.2.6. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 11, is reflected in the third position of the related text paragraph numbers, in this case 9.5.11. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *j* to Worksheet 9.6.2 directs that the presence of a single egress route is scored as a value of -6 only for a one-story building. Where a single egress route occurs in other than a one-story building, the parameter score is *NV*. Upon encountering an *NV* parameter value, the NFPA 101A equivalency evaluation is halted. Other means for judging equivalency must be used as the NFPA 101A evaluation system is unable to evaluate overall safety.

9.5.12

The text associated with scoring Safety Parameter 12, "Corridor/Room Separation," of Worksheet 9.6.2 appears in 9.5.12 through 9.5.12.1.4. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 12, is reflected in the third position of the related text paragraph numbers, in this case 9.5.12. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *l* to Worksheet 9.6.2 raises the score by one point where the door in a smoke partition opening is smoke resistant but has no closer if the building is sprinklered. The sprinkler system should control a fire so as not to need to penalize as heavily the absence of a door closer.

Note *m* to Worksheet 9.6.2 clarifies that the presence of sprinklers throughout the building does not raise the score as it did relative to Note *l*.

9.5.13

The text associated with scoring Safety Parameter 13, "Smoke Control," of Worksheet 9.6.2 appears in 9.5.13 through 9.5.13.3. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 13, is reflected in the third position of the related text paragraph numbers, in this case 9.5.13. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

Note *k* to Worksheet 9.6.2 awards the same score as would be awarded to passive smoke control if no smoke control is provided but the resulting compartment size does not exceed the threshold for which NFPA *101* requires passive smoke control. See NFPA *101* 14.3.7 and 15.3.7.

9.5.14

The text associated with scoring Safety Parameter 14, "Occupant Emergency Program," of Worksheet 9.6.2 appears in 9.5.14 through 9.5.14.2. The worksheet value should not be scored without consulting the text portion of the document. Note that the safety parameter number, in this case 14, is reflected in the third position of the related text paragraph numbers, in this case 9.5.14. The consistent numbering scheme lends ease to moving between the worksheet and the related text.

The number and frequency of drills for which Safety Parameter 14, "Occupant Emergency Program," is scored as a value of 0 are those required by NFPA *101* 14.7.2 and 15.7.2.

9.6

A full set of worksheets — Worksheet 9.6.1 through Worksheet 9.6.7 — must be completed for the building being evaluated, or for any zone evaluated separately as permitted by 9.3.2.1. The NFPA 101A Origin and Development section, printed on page 101A-1, advises that the worksheets are copyrighted by NFPA, but users are permitted to copy them for private use.

9.6.1

Worksheet 9.6.1, Cover Sheet, identifies the facility being evaluated as well as the evaluator and the date of evaluation.

9.6.2

Worksheet 9.6.2 is employed by circling the value selected for each of the fourteen safety parameters. Interspersed in the annotated text are individual explanations of Worksheet 9.6.2 Note *a* through Note *m*.

Each of the fourteen circled safety parameter values of Worksheet 9.6.2 is transferred to Worksheet 9.6.3, Individual Safety Evaluation. The word "individual" in the title of the worksheet emphasizes that safety is to be evaluated from multiple perspectives. The three safety evaluations conducted include fire control (S_1), egress (S_2), and general fire safety (S_3). Each of the safety parameter values needs to be transferred two or three times to Worksheet 9.6.3 depending on whether the safety parameter contributes to the specific safety evaluation. Where a safety parameter has no effect on a given safety evaluation, the corresponding cell of the worksheet is X-ed out. Note also that multiple safety parameter values are weighted in specific columns so as to have only half the effect that the other applicable safety parameter values have (as indicated by the ÷2= notation) and as explained in the text of 9.6.2(2).

The arithmetic process of dividing a negative number by 2 is the same as dividing a positive number by 2. For example, (-4)/2 = -2 and (+4)/2 = 2. The intent is that the consideration is to carry only half as much weight — negative or positive — in the evaluation.

Each of the three columns of values in Worksheet 9.6.3 is added. The text of 9.6.2(3) reminds the user that any negative numbers need to be deducted. The arithmetic exercises produce values for S_1, S_2, and S_3. Those values are transferred to Worksheet 9.6.5.

9.6.3

The user goes to Worksheet 9.6.4A for new buildings ≤20,000 ft² (≤1860 m²) or existing buildings, or the user goes to Worksheet 9.6.4B for new buildings >20,000 ft² (>1860 m²). The 20,000 ft² (1860 m²) criterion reflects the sprinkler system requirement threshold of the 2009 edition of NFPA *101* for new educational occupancies. For the 2012 edition of NFPA *101* the threshold was reduced to 12,000 ft² (1120 m²). The change is not reflected in the 2013 edition of NFPA 101A. The error will need to be corrected for the 2016 edition.

Where Worksheet 9.6.4A applies, the user circles the appropriate value in each of three columns identified based upon stories in height (as addressed previously in Safety Parameter 1, Construction, and in the text of 9.5.1 and its associated annotated text) and whether the equivalency analysis is being applied to new construction or to an existing situation. Where Worksheet 9.6.4B applies, the user circles the appropriate value in each of three columns identified based upon stories in height.

The mandatory safety requirements values contained in Worksheet 9.6.4A and Worksheet 9.6.4B are calculated by the technical committee responsible for NFPA 101A to reflect a code-compliant situation in accordance with the requirements of NFPA *101*-2012. For a more detailed explanation see the NFPA 101A annex material numbered A.1.3.1.

The mandatory safety requirements values — S_a for fire control, S_b for egress, and S_c for general fire safety — are transferred to Worksheet 9.6.5.

9.6.4

The six boxes in Worksheet 9.6.5 represent values transferred in earlier steps as follows:

1. The values for S_1, S_2, and S_3 represent individual fire safety evaluation values calculated in Worksheet 9.6.3 and transferred to Worksheet 9.6.5 in Step 2.
2. The values for S_a, S_b, and S_c represent the mandatory safety requirements values selected from Worksheet 9.6.4A or Worksheet 9.6.4B and transferred to Worksheet 9.6.5 in Step 3.

Worksheet 9.6.5 is missing three additional boxes where the resultant values from subtracting S_a from S_1, S_b from S_2, and S_c from S_3 should be entered. See Worksheet 8.6.5 in the business occupancies FSES for a good example of how the worksheet should be formatted. The user identifies whether each of the resultants is greater than, or equal to, zero. The appropriate box for *Yes* or *No* is checked.

9.6.5

Worksheet 9.6.6 is completed. All references in the worksheet are to NFPA *101*. Worksheet 9.6.6 is included as part of the FSES in recognition that the risk/hazard indexing system (see annotated text associated with 1.3.3) employing the safety parameters of Worksheet 9.6.2 does not evaluate some considerations required by NFPA *101* for *Code* compliance. Those considerations

must be considered separately. The combined effect of the equivalency evaluation performed using Worksheet 9.6.1 through Worksheet 9.6.5 and the additional evaluation performed using Worksheet 9.6.6 are addressed, as conclusions, in Worksheet 9.6.7.

9.6.6

For the 2013 edition of NFPA 101A, Worksheet 9.6.7 was revised to formalize the process of concluding whether equivalency has been achieved by taking into account both the equivalency evaluation performed using Worksheets 9.6.1 through 9.6.5 and the additional evaluation performed using Worksheet 9.6.6. Revised Worksheet 9.6.7, Conclusions, requires mitigation of any considerations checked as *Not Met* in Worksheet 9.6.6 before the building or zone can be judged to provide fire and life safety equivalent to that prescribed in NFPA *101*.

(FIGURE 9.6) Worksheet 9.6.2 Safety Parameter Values

It is important that the user of the Chapter 9 FSES not attempt to score the parameter values of Worksheet 9.6.2 without consulting the associated text in 9.5 through 9.5.14.2. Those paragraphs are accompanied by significant annotated text on how to use the worksheet, including Note *a* through Note *m*.

For ease in moving between Worksheet 9.6.2 and the detailed text, note the correlative numbering scheme employed where the safety parameter number appears in the third position of the associated text paragraph number. The numbering scheme is illustrated in Exhibit 26.

Safety Parameter No.	Parameter Heading	Associated Text
1	Construction	9.5.**1**
2	Segregation of hazards	9.5.**2**
3	Vertical openings	9.5.**3**
4	Sprinklers	9.5.**4**
5	Detection, alarm, and communication	9.5.**5**
6	Emergency forces notification	9.5.**6**
7	Interior finish in exits	9.5.**7**
8	Interior finish in corridors and lobbies	9.5.**8** (see 9.5.7)
9	Interior finish in rooms	9.5.**9** (see 9.5.7)
10	Exit access corridor	9.5.**10**
11	Egress routes	9.5.**11**
12	Corridor/room separation	9.5.**12**
13	Smoke control	9.5.**13**
14	Occupant emergency program	9.5.**14**

Exhibit 26 Correlative numbering between safety parameter number and associated text.

A.1.3.1

As explained in the text of A.1.3.1, the spreadsheets used to calculate the mandatory values serve as a record of the safety parameters and associated point values determined by the technical committee as the baseline required by the *Code*. The spreadsheets that appear as the Appendix serve as the historical record of the FSES calibration performed for the 2013 edition of NFPA 101A.

N101A06.XLS
FIRE SAFETY EVALUATION SYSTEM FOR HEALTH CARE OCCUPANCIES
BASED ON 2012 LSC

1-STORY HEALTH CARE OCCUPANCY

PARAMETER	NEW FACILITIES (AS) SLEEPING	NEW FACILITIES (AS) NON-SLEEPING	EXISTING FACILITIES <NS>
1. CONSTRUCTION	III(211)	III(211)	II(111)
. (POINT VALUE)	0	0	2
2.CORR. FINISH	CLASS B	CLASS B	CLASS B
. (POINT VALUE)	0	0	0
3.ROOM FINISH	CLASS B	CLASS B	CLASS B
. (POINT VALUE)	1	1	1
4.CORR. WALLS	<1/2 HR	<1/2 HR	>1/2 HR
. (POINT VALUE)	0	0	1
5.CORR. DOORS	<20 MIN.	<20 MIN.	20 MIN.
. (POINT VALUE)	0	0	1
6.ZONE DIMEN.	100-150 FT.	100-150 FT.	100-150 FT.
. (POINT VALUE)	0	0	0
7.VERT. OPENINGS	1-HR	1-HR	2-HR
. (POINT VALUE)	0	0	0
8.HAZ. AREAS	NO DEF.S	NO DEF.S	NO DEF.S
. (POINT VALUE)	0	0	0
9.SMOKE CONTROL	BARRIER	BARRIER	BARRIER
. (POINT VALUE)	0	0	0
10.EMER. ROUTES	W/O HORZ.	W/O HORZ.	W/O HORZ.
. (POINT VALUE)	0	0	0
11.MANUAL F.A.	W/F.D.NOTIF.	W/F.D.NOTIF.	W/F.D.NOTIF.
. (POINT VALUE)	2	2	2
12.SMOKE DETECT.	ROOMS	NONE	NONE
. (POINT VALUE)	3	0	0
13.SPRINKLERS	ENTIRE BLDG.	ENTIRE BLDG.	NONE
. (POINT VALUE)	10	10	0
S1	11	11	5
S2	15	12	4
S3	8	5	1
SG	16	13	7

APPENDIX

Mandatory Values Calibration Sheets Reflecting Requirements of NFPA *101*-2012

2 AND 3 STORY HEALTH CARE OCCUPANCIES

		EXISTING FACILITIES	
PARAMETER	NEW FACILITIES (AS)	(AS)	<NS>
1. CONSTRUCTION	II(111)	II(111)	II(222)
. (POINT VALUE)	2	2	4
2.CORR. FINISH	CLASS B	CLASS B	CLASS B
. (POINT VALUE)	0	0	0
3.ROOM FINISH	CLASS B	CLASS B	CLASS B
. (POINT VALUE)	1	1	1
4.CORR. WALLS	<1/3 HR	<1/3 HR	>1/3 HR
. (POINT VALUE)	0	0	1
5.CORR. DOORS	<20 MIN.	<20 MIN.	20 MIN.
. (POINT VALUE)	0	0	1
6.ZONE DIMEN.	100-150 FT.	100-150 FT.	100-150 FT.
. (POINT VALUE)	0	0	0
7.VERT. OPENINGS	1-HR	1-HR 1-HR	
. (POINT VALUE)	2	2	2
8.HAZ. AREAS	NO DEF.S	NO DEF.S	NO DEF.S
. (POINT VALUE)	0	0	0
9.SMOKE CONTROL	BARRIER	BARRIER	BARRIER
. (POINT VALUE)	0	0	0
10.EMER. ROUTES	W/O HORZ.	W/O HORZ.	W/O HORZ.
. (POINT VALUE)	0	0	0
11.MANUAL F.A.	W/F.D.NOTIF.	W/F.D.NOTIF.	W/F.D.NOTIF.
. (POINT VALUE)	2	2	2
12.SMOKE DETECT.	NONE	NONE	NONE
. (POINT VALUE)	3	0	0
13.SPRINKLERS	ENTIRE BLDG.	ENTIRE BLDG.	NONE
. (POINT VALUE)	10	10	0
S1	15	15	9
S2	17	14	6
S3	10	7	3
SG	20	17	11

4 STORY OR HIGHER HEALTH CARE OCCUPANCIES

PARAMETER	NEW FACILITIES (AS)	(AS)	EXISTING FACILITIES <NS>	(AS)
1. CONSTRUCTION	II(222)	II(222)	II(222)	
. (POINT VALUE)	4	4	4	
2.CORR. FINISH	CLASS B	CLASS B	CLASS B	
. (POINT VALUE)	0	0	0	
3.ROOM FINISH	CLASS B	CLASS B	CLASS B	
. (POINT VALUE)	1	1	1	
4.CORR. WALLS	<1/3 HR	<1/3 HR	>1/3 HR	
. (POINT VALUE)	0	0	1	
5.CORR. DOORS	<20 MIN.	<20 MIN.	20 MIN.	
. (POINT VALUE)	0	0	1	
6.ZONE DIMEN.	100-150 FT.	100-150 FT.	100-150 FT.	
. (POINT VALUE)	0	0	0	
7.VERT. OPENINGS	2-HR	2-HR	2-HR	
. (POINT VALUE)	3	3	2	
8.HAZ. AREAS	NO DEF.S	NO DEF.S	NO DEF.S	
. (POINT VALUE)	0	0	0	
9.SMOKE CONTROL	BARRIER	BARRIER	BARRIER	
. (POINT VALUE)	0	0	0	
10.EMER. ROUTES	W/O HORZ.	W/O HORZ.	W/O HORZ.	
. (POINT VALUE)	0	0	0	
11.MANUAL F.A.	W/F.D.NOTIF.	W/F.D.NOTIF.	W/F.D.NOTIF.	
. (POINT VALUE)	2	2	2	
12.SMOKE DETECT.	NONE	NONE	NONE	
. (POINT VALUE)	3	0	0	
13.SPRINKLERS	ENTIRE BLDG.	ENTIRE BLDG.	NONE	
. (POINT VALUE)	10	10	0	
S1	18	18	9	
S2	19	16	6	
S3	11	8	3	
SG	23	20	11	

N101A04.XLS
FIRE SAFETY EVALUATION SYSTEM FOR HEALTH CARE OCCUPANCIES
BASED ON 2003 LSC

1-STORY HEALTH CARE OCCUPANCY

PARAMETER	EXISTING FACILITIES - MAJOR REHABILITATION	
	<NS> SLEEPING	<NS> NON-SLEEPING
1. CONSTRUCTION	II(111)	II(111)
. (POINT VALUE)	2	2
2.CORR. FINISH	CLASS B	CLASS B
. (POINT VALUE)	0	0
3.ROOM FINISH	CLASS B	CLASS B
. (POINT VALUE)	1	1
4.CORR. WALLS	<1/3 HR	<1/3 HR
. (POINT VALUE)	0	0
5.CORR. DOORS	<20 MIN.	<20 MIN.
. (POINT VALUE)	0	0
6.ZONE DIMEN.	100-150 FT.	100-150 FT.
. (POINT VALUE)	0	0
7.VERT. OPENINGS	1-HR	1-HR
. (POINT VALUE)	0	0
8.HAZ. AREAS	NO DEF.S	NO DEF.S
. (POINT VALUE)	0	0
9.SMOKE CONTROL	BARRIER	BARRIER
. (POINT VALUE)	0	0
10.EMER. ROUTES	W/O HORZ.	W/O HORZ.
. (POINT VALUE)	0	0
11.MANUAL F.A.	W/F.D.NOTIF.	W/F.D.NOTIF.
. (POINT VALUE)	2	2
12.SMOKE DETECT.	NONE	NONE
. (POINT VALUE)	3	0
13.SPRINKLERS	ENTIRE BLDG.	ENTIRE BLDG.
. (POINT VALUE)	10	10
S1	13	13
S2	17	14
S3	8	5
SG	18	15

Mandatory Values

Zone Location	Containment New	Containment Existing	Extinguishment New	Extinguishment New - No sleeping rooms
1st Story	11	5	15	12
2nd or 3rd Story	15	9	17	14
4th story or higher	18	9	19	16

Mandatory Values Existing Nursing Homes

Zone Location	Containment	Extinguishment	People Movement
1st Story	0	10	0
2nd Story	2	10	2
3rd Story	6	14	2
4th Story or higher	8	16	2

Mandatory Values Major Rehabilitations

Zone Location	Containment	Extinguishment	Extinguishment - No sleeping rooms	People Movement
1st Story	13	17	14	8
2nd or 3rd Story	17	19	16	10
4th story or higher	18	19	16	11

Extinguishment	People Movement	People Movement New - No sleeping rooms	People Movement
Existing	New		Existing
4	8	5	1
6	10	7	3
6	11	8	3

People Movement - No sleeping rooms
5
7
8

FILE N101A06.XLS
FIRE SAFETY EVAL. SYSTEM FOR DETENTION & CORRECTION FAC.S
BASED ON 2012 LSC

PARAMETER	D&C USE CONDITION II EXISTING <NS> 1STY	2STY	>=3STY	HIGH R.
1. CONSTRUCTION	V(000)	V(111)	II(222)	
(POINTS)	-2	0	2	
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF	
(POINTS)	0	0	0	
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD	
(POINTS)	2	2	2	
4. SMOKE DET.	CORR +	CORR +	CORR +	
(POINTS)	0	0	0	
5. AUTO. SPRINKLERS	NONE	NONE	NONE	
(POINTS)	0	0	0	
6. INT. FIN. (EGRESS)	B	B	B	
(POINTS)	-1	-1	-1	
7. INT. FIN. (OTHER)	C	C	C	
(POINTS)	-2	-2	-2	
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1	
(POINTS)	0	0	0	
9. SEPARATION	SM.T<1	SM.T<1	SM.T<1	
(POINTS)	2	2	2	
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.	
(POINTS)	0	0	0	
11. EXIT ACCESS	<=150'	<=150'	<=150'	
(POINTS)	0	0	0	
12. VERT. OPENINGS		F.R.	F.R.	
(POINTS)	0	2	2	
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE	
(POINTS)	2	2	2	
S1	0	3	5	
S2	4	6	6	
S3	2	6	8	
S4	1	5	7	
	1STY	2STY	>=3STY	
	USE CONDITION II EXISTING <NS>			

PARAMETER	D&C USE CONDITION 3 EXISTING <NS> 1STY	2STY	>=3STY	HIGH R.
1. CONSTRUCTION	V(000)	V(111)	II(222)	
(POINTS)	-2	0	2	
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF	
(POINTS)	0	0	0	
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD	
(POINTS)	2	2	2	
4. SMOKE DET.	CORR +	CORR +	CORR +	
(POINTS)	0	0	0	
5. AUTO. SPRINKLERS	NONE	NONE	NONE	
(POINTS)	0	0	0	
6. INT. FIN. (EGRESS)	B	B	B	
(POINTS)	-1	-1	-1	
7. INT. FIN. (OTHER)	C	C	C	C
(POINTS)	-2	-2	-2	
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1	
(POINTS)	0	0	0	
9. SEPARATION	SM.T<1	SM.T<1	SM.T<1	
(POINTS)	2	2	2	
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.	
(POINTS)	0	0	0	
11. EXIT ACCESS	<=150'	<=150'	<=150'	
(POINTS)	0	0	0	
12. VERT. OPENINGS		F.R.	F.R	
(POINTS)	0	2	2	
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE	
(POINTS)	2	2	2	
	0	3	5	
	4	6	6	
	2	6	8	
	1	5	7	
	1STY	2STY	>=3STY	
	USE CONDITION 3 EXISTIN <NS>			

PARAMETER	D&C USE CONDITION 4 EXISTING <NS> 1STY	2STY	>=3STY	HIGH R.
1. CONSTRUCTION	V(000)	V(111)	II(222)	
(POINTS)	-2	0	2	
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF	
(POINTS)	0	0	0	
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD	
(POINTS)	2	2	2	
4. SMOKE DET.	FULL	FULL	FULL	
(POINTS)	4	4	4	
5. AUTO. SPRINKLERS	NONE	NONE	NONE	
(POINTS)	0	0	0	
6. INT. FIN. (EGRESS)	B	B	B	
(POINTS)	-1	-1	-1	
7. INT. FIN. (OTHER)	C	C	C	
(POINTS)	-2	-2	-2	
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1	
(POINTS)	0	0	0	
9. SEPARATION	SM.T<1	SM.T<1	SM.T<1	
(POINTS)	2	2	2	
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.	
(POINTS)	0	0	0	
11. EXIT ACCESS	<=150'	<=150'	<=150'	
(POINTS)	0	0	0	
12. VERT. OPENINGS		F.R.	F.R.	
(POINTS)	0	2	2	
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE	
(POINTS)	2	2	2	
	2	5	7	
	8	10	10	
	2	6	8	
	5	9	11	
	1STY	2STY	>=3STY	
	USE CONDITION 4 EXISTIN <NS>			

PARAMETER	D&C USE CONDITION 5 EXISTING <NS> 1STY	2STY	>=3STY	HIGH R.
1. CONSTRUCTION	V(000)	II(111)	II(222)	
(POINTS)	0	2	2	
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF	
(POINTS)	0	0	0	
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD	
(POINTS)	2	2	2	
4. SMOKE DET.	FULL	FULL	FULL	
(POINTS)	4	4	4	
5. AUTO. SPRINKLERS	NONE	NONE	NONE	
(POINTS)	0	0	0	
6. INT. FIN. (EGRESS)	B	B	B	
(POINTS)	-1	-1	-1	
7. INT. FIN. (OTHER)	C	C	C	
(POINTS)	-2	-2	-2	
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1	
(POINTS)	0	0	0	
9. SEPARATION	>1HR	>1HR	>1HR	
(POINTS)	4	4	4	
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.	
(POINTS)	0	0	0	
11. EXIT ACCESS	<=150'	<=150'	<=150'	
(POINTS)	0	0	0	
12. VERT. OPENINGS		F.R.	F.R.	
(POINTS)	0	2	2	
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE	
(POINTS)	2	2	2	
	6	9	9	
	9	11	11	
	6	10	10	
	9	13	13	
	1STY	2STY	>=3STY	
	USE CONDITION 5 EXISTIN <NS>			

PARAMETER	D&C USE CONDITION 2&3 >NEW <NS> 1STY	2STY	>=3STY	HIGH R.
1. CONSTRUCTION	V(000)	V(111)	II(222)	
(POINTS)	0	0	2	
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF	
(POINTS)	0	0	0	
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD	
(POINTS)	2	2	2	
4. SMOKE DET.	CORR +	CORR +	CORR +	
(POINTS)	0	0	0	
5. AUTO. SPRINKLERS	NONE	NONE	NONE	
(POINTS)	0	0	0	
6. INT. FIN. (EGRESS)	A	A	A	
(POINTS)	0	0	0	
7. INT. FIN. (OTHER)	C	C	C	
(POINTS)	-2	-2	-2	
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1	
(POINTS)	0	0	0	
9. SEPARATION	>1HR	>1HR	>1HR	
(POINTS)	4	4	4	
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.	
(POINTS)	0	0	0	
11. EXIT ACCESS	<=150'	<=150'	<=150'	
(POINTS)	0	0	0	
12. VERT. OPENINGS		F.R.	F.R.	
(POINTS)	0	2	2	
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE	
(POINTS)	2	2	2	
	4	5	7	
	6	8	8	
	6	8	10	
	6	8	10	
	1STY	2STY	>=3STY	
	USE CONDITION 2&3 >NEW <NS>			

PARAMETER	D&C USE CONDITION 4 >NEW <NS> 1STY	2STY	>=3STY	HIGH R.
1. CONSTRUCTION	V(000)	V(111)	II(222)	
(POINTS)	0	0	2	
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF	
(POINTS)	0	0	0	
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD	
(POINTS)	2	2	2	
4. SMOKE DET.	FULL	FULL	FULL	
(POINTS)	4	4	4	
5. AUTO. SPRINKLERS	NONE	NONE	NONE	
(POINTS)	0	0	0	
6. INT. FIN. (EGRESS)	A	A	A	
(POINTS)	0	0	0	
7. INT. FIN. (OTHER)	C	C	C	
(POINTS)	-2	-2	-2	
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1	
(POINTS)	0	0	0	
9. SEPARATION	>1HR	>1HR	>1HR	
(POINTS)	4	4	4	
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.	
(POINTS)	0	0	0	
11. EXIT ACCESS	<=150'	<=150'	<=150'	
(POINTS)	0	0	0	
12. VERT. OPENINGS		F.R	F.R	
(POINTS)	0	2	2	
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE	
(POINTS)	2	2	2	
	6	7	9	
	10	12	12	
	6	8	10	
	10	12	14	
	1STY	2STY	>=3STY	
	USE CONDITION 4 >NEW <NS>			

	D&C USE CONDITION 5 >NEW <NS>		
PARAMETER	1STY	2STY	>=3STY
1. CONSTRUCTION	II(111)	II(111)	II(222)
(POINTS)	2	2	2
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF
(POINTS)	0	0	0
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD
(POINTS)	2	2	2
4. SMOKE DET.	FULL	FULL	FULL
(POINTS)	4	4	4
5. AUTO. SPRINKLERS	NONE	NONE	NONE
(POINTS)	0	0	0
6. INT. FIN. (EGRESS)	A	A	A
(POINTS)	0	0	0
7. INT. FIN. (OTHER)	C	C	C
(POINTS)	-2	-2	-2
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1
(POINTS)	0	0	0
9. SEPARATION	>1HR	>1HR	>1HR
(POINTS)	4	4	4
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.
(POINTS)	0	0	0
11. EXIT ACCESS	<=150'	<=150'	<=150'
(POINTS)	0	0	0
12. VERT. OPENINGS		F.R.	F.R
(POINTS)	0	2	2
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE
(POINTS)	2	2	2
	8	9	9
	10	12	12
	8	10	10
	12	14	14
	1STY	2STY	>=3STY
	USE CONDITION 5 >NEW <NS>		

PARAMETER	D&C USE CONDITION 2.3.& 4 >EXISTING (AS) 1STY	2STY	>=3STY
1. CONSTRUCTION	V(000)	V(000)	V(000)
(POINTS)	-2	-2	-2
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF
(POINTS)	0	0	0
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD
(POINTS)	2	2	2
4. SMOKE DET.	CORR +	CORR +	CORR +
(POINTS)	0	0	0
5. AUTO. SPRINKLERS	FULL	FULL	FULL
(POINTS)	10	10	10
6. INT. FIN. (EGRESS)	C	C	C
(POINTS)	-3	-3	-3
7. INT. FIN. (OTHER)	C	C	C
(POINTS)	-2	-2	-2
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1
(POINTS)	0	0	0
9. SEPARATION	INCOM.	INCOM.	INCOM.
(POINTS)	-6	-6	-6
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.
(POINTS)	0	0	0
11. EXIT ACCESS	<225'	<225'	<225'
(POINTS)	-1	-1	-1
12. VERT. OPENINGS		SM.T.	SM.T.
(POINTS)	0	0	0
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE
(POINTS)	2	2	2
	2	2	2
	2	2	2
	-1	-1	-1
	0	0	0

	1STY	2STY	>=3STY
USE CONDITION 2.3.& 4 >EXISTING (AS)			

	D&C USE CONDITION 5 >EXISTING (AS)		
PARAMETER	1STY	2STY	>=3STY
1. CONSTRUCTION	V(000)	V(000)	V(000)
(POINTS)	-2	-2	-2
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF
(POINTS)	0	0	0
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD
(POINTS)	2	2	2
4. SMOKE DET.	CORR +	CORR +	CORR +
(POINTS)	0	0	0
5. AUTO. SPRINKLERS	FULL	FULL	FULL
(POINTS)	10	10	10
6. INT. FIN. (EGRESS)	C	C	C
(POINTS)	-3	-3	-3
7. INT. FIN. (OTHER)	C	C	C
(POINTS)	-2	-2	-2
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1
(POINTS)	0	0	0
9. SEPARATION	SM.T<1	SM.T<1	SM.T<1
(POINTS)	2	2	2
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.
(POINTS)	0	0	0
11. EXIT ACCESS	=200' >150'	=200' >150'	=200' >150'
(POINTS)	-1	-1	-1
12. VERT. OPENINGS	SM.T	SM.T	SM.T
(POINTS)	0	0	0
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE
(POINTS)	2	2	2
	10	10	10
	6	6	6
	7	7	7
	8	8	8
	1STY	2STY	>=3STY
	USE CONDITION 5 >EXISTING (AS)		

PARAMETER	D&C USE CONDITION 2, 3 & 4 >NEW (AS) 1STY	2STY	>=3STY
1. CONSTRUCTION	V(000)	V(000)	II(222)
(POINTS)	-2	-2	2
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF
(POINTS)	0	0	0
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD
(POINTS)	2	2	2
4. SMOKE DET.	CORR +	CORR +	CORR +
(POINTS)	0	0	0
5. AUTO. SPRINKLERS	FULL	FULL	FULL
(POINTS)	10	10	10
6. INT. FIN. (EGRESS)	B	B	B
(POINTS)	-1	-1	-1
7. INT. FIN. (OTHER)	C	C	C
(POINTS)	-2	-2	-2
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1
(POINTS)	0	0	0
9. SEPARATION	INCOM.	INCOM.	INCOM.
(POINTS)	-6	-6	-6
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.
(POINTS)	0	0	0
11. EXIT ACCESS	<225'	<225'	<225'
(POINTS)	-1	-1	-1
12. VERT. OPENINGS	SM RESIST	SM RESIST	FIRE RESIST
(POINTS)	0	0	2
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE
(POINTS)	2	2	2
	2	2	7
	4	4	6
	-1	-1	5
	2	2	8

	1STY	2STY	>=3STY
USE CONDITION 2, 3 & 4 >NEW (AS)			

PARAMETER	D&C USE CONDITION 5 >NEW (AS) 1STY	2STY	>=3STY
1. CONSTRUCTION	V(000)	V(000)	II(222)
(POINTS)	-2	-2	2
2. HAZ. AREAS	NO DEF	NO DEF	NO DEF
(POINTS)	0	0	0
3. FIRE ALARM	MAN+FD	MAN+FD	MAN+FD
(POINTS)	2	2	2
4. SMOKE DET.	CORR +	CORR +	CORR +
(POINTS)	0	0	0
5. AUTO. SPRINKLERS	FULL	FULL	FULL
(POINTS)	10	10	10
6. INT. FIN. (EGRESS)	B	B	B
(POINTS)	-1	-1	-1
7. INT. FIN. (OTHER)	C	C	C
(POINTS)	-2	-2	-2
8. CELL/RM. ENCL	SM.T<1	SM.T<1	SM.T<1
(POINTS)	0	0	0
9. SEPARATION	SM.T<1	SM.T<1	SM.T<1
(POINTS)	2	2	2
10. EXIT SYSTEM	NO DEF.	NO DEF.	NO DEF.
(POINTS)	0	0	0
11. EXIT ACCESS	<225'	<225'	<225'
(POINTS)	-2	-2	-2
12. VERT. OPENINGS	SM RESIST	SM RESIST	FIRE RESIST
(POINTS)	0	0	2
13. SMOKE CONT.	PASSIVE	PASSIVE	PASSIVE
(POINTS)	2	2	2
	10	10	15
	7	7	9
	7	7	13
	9	9	15
	1STY	2STY	>=3STY
	USE CONDITION 5 >NEW (AS)		

Partially or Non Sprinklered, Existing other than Highrise

Use Condition	Height	Fire Control	Egress	Refuge	General
II + III	1 Story	0	4	2	1
	2 Stories	3	6	6	5
	>=3 Stories	5	6	8	7
IV	1 Story	2	8	2	5
	2 Stories	5	10	6	9
	>=3 Stories	7	10	8	11
V	1 Story	6	9	6	9
	2 Stories	9	11	10	13
	>=3 Stories	9	11	10	13

New Buildings, Totally Sprinklered Buildings or Highrise

Use Condition	Height	Fire Control		Egress		Refuge
		New	Existing	New	Existing	New
II, III, IV	1 Story and					
	2 Stories	2	2	4	2	-1
	>=3 Stories	7	2	6	2	5
V	1 Story and					
	2 Stories	10	10	7	6	7
	>=3 Stories	15	10	9	6	13

Modernizations or Renovations in Non Sprinklered, Existing other than Highri

Use Condition	Height	Fire Control	Egress	Refuge	General
II + III	1 Story	4	6	6	6
	2 Stories	5	8	8	8
	>=3 Stories	7	8	10	10
IV	1 Story	6	10	6	10
	2 Stories	7	12	8	12
	>=3 Stories	9	12	10	14
V	1 Story	8	10	8	12
	2 Stories	9	12	10	14
	>=3 Stories	9	12	10	14

	General	
Existing	New	Existing
-1	2	0
-1	8	0
7	9	8
7	15	8

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FILE N101A06.XLS
FIRE SAFETY EVALUATION SYSTEM FOR SMALL BOARD AND CARE
BASED ON 2012 LSC

PARAMETER	PROMPT		SLOW	IMPRAC.
	<NS> EXISTING	(AS) NEW	<NS> EXISTING	(AS) EXISTING
1.CONSTRUCTION	EXPOSED	EXPOSED	PROTECTED-15	EXPOSED
(POINTS)	0	0	1	0
2.HAZ. AREAS	NO. DEF.S	NO. DEF.S	NO. DEF.S	NO. DEF.S
(POINTS)	0	0	0	0
3.MANUAL F.A.	W/O F.D. NOTIF.	W/O F.D. NOTIF.	W/O F.D. NOTIF.	W/O F.D. NOTIF.
(POINTS)	1	1	1	1
4.SMOKE DETECTION	EVERY LEVEL	EVERY LEVEL+	EVERY LEVEL	EVERY LEVEL
(POINTS)	2	3	2	2
5.SPRINKLERS	NONE	YES	NONE	YES-STD
(POINTS)	0	10	0	8
6.INTER. FINISH	<200	<200	>25 to <=75	<200
(POINTS)	-3	-3	-1	-3
7.SEPERATION OF SLEEPIMG ROOMS	SMK.RES. W/CLOSER	SMK.RES. W/O CLR	1/2 HR AUTO CLSR	SMK REST W/O CLSR
(P0INTS)	1	0	2	0
8.EGRESS	W/ALT.	UNPROT PRIM-W/O A	REMOTE SEP'TED	REMOTE SEP'TED
(POINTS)	0	-4	2	2
S1	0	10.5	2	8
S2	4	5	7	9
S3	2	11.5	4	9
S4	1	7	7	10
	PROMPT <NS> EXISTING	PROMPT (AS) NEW	SLOW <NS> EXISTING	IMPRAC. <NS> EXISTING

SMALL B&C

PARAMETER	SLOW (EVAC <8 MIN OR E-SCORE <=3) <NS>
1.CONSTRUCTION	EXPOSED
(POINTS)	0
2.HAZ. AREAS	NO. DEF.S
(POINTS)	0
3.MANUAL F.A.	W/O F.D. NOTIF.
(POINTS)	1
4.SMOKE DETECTION	EVERY LEVEL
(POINTS)	2
5.SPRINKLERS	NONE
(POINTS)	0
6.INTER. FINISH	<75
(POINTS)	-1
7.SEPERATION OF SLEEPIMG ROOMS	SMK.RES. W/CLR
(P0INTS)	1
8.EGRESS	REMOTE SEP'TED
(POINTS)	2

S1	1
S2	6
S3	2
S4	5
SLOW (EVAC <8 MIN OR E-SCORE <=3) <NS>	

Mandatory Requirements
New Small Facility

Control	Egress	Refuge	General
10.5	5	11.5	7

Mandatory Requirements
Existing Small Facility

Evacuation Difficulty	Control	Egress	Refuge	General
Prompt	0	4	2	1
Slow	2	7	4	7
Slow*	1	6	2	5
Impractical	8	9	9	10

FILE N101A06.XLS
FIRE SAFETY EVALUATION SYSTEM FOR LARGE BOARD & CARE FACILITIES
BASED ON 2012 LSC

1 STORY PROMPT LARGE B&C FACILITY <30 PERSONS

PARAMETER	EXISTING FACILITIES <NS>	(AS)
1.CONSTRUCTION	V(000)	V(000)
(POINTS)	-2	-2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	WO/F.D. NOTIF	WO/F.D. NOTIF
(POINTS)	2	2
4. SMOKE DETEC.	INTER. CORR. SYS.	INTER. CORR. SYS.
(POINTS)	2	2
5. SPRINKLERS	NONE	TOTAL
(POINTS)	0	8
6. SEPERATION OF SLEEPING ROOMS	SMK.REST. W/CLOSER	SMK.REST. W/O CLOSER
(POINTS)	1	-1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	100 FT.	150 FT
(POINTS)	0	-1
9. INTERIOR FINISH	CLASS B	CLASS C
(POINTS)	1	-3
10. VERTICAL OPG.S	1/2-HR	1/2-HR
(POINTS)	0	0
11. SMOKE CONTROL	BARRIERS	NO BARR.
(POINTS)	2	0
S1	1.5	5.5
S2	7.5	3.5
S3	2	6
S4	6	5

1-STORY PROMPT OR SLOW LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES <NS>	(AS)
1.CONSTRUCTION	V(000) (SHEATHED)	V(000)
(POINTS)	-1	-2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	WO/F.D. NOTIF	WO/F.D. NOTIF
(POINTS)	2	2
4. SMOKE DETEC.	INTER. CORR. SYS.	INTER. CORR. SYS.
(POINTS)	2	2
5. SPRINKLERS	NONE	TOTAL
(POINTS)	0	8
6. SEPERATION OF SLEEPING ROOMS	20 MIN. W/CLOSER	SMK.REST. W/O CLOSER
(POINTS)	2	-1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	100 FT.	150 FT
(POINTS)	0	-1
9. INTERIOR FINISH	CLASS B	CLASS C
(POINTS)	1	-3
10. VERTICAL OPG.S	1/2-HR	1/2-HR
(POINTS)	0	0
11. SMOKE CONTROL	BARRIERS	NO BARR.
(POINTS)	2	0
S1	3.5	5.5
S2	8	3.5
S3	4	6
S4	8	5

2-STORY PROMPT LARGE B&C FACILITY <30 PERSONS

PARAMETER	EXISTING FACILITIES <NS>	(AS)
1.CONSTRUCTION	V(000) (SHEATHED)	V(000)
(POINTS)	-2	-6
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	WO/F.D. NOTIF	WO/F.D. NOTIF
(POINTS)	2	2
4. SMOKE DETEC.	INTER. CORR. SYS.	INTER. CORR. SYS.
(POINTS)	2	2
5. SPRINKLERS	NONE	TOTAL
(POINTS)	0	8
6. SEPERATION OF SLEEPING ROOMS	20 MIN W/CLOSER	SMK.REST. W/O CLOSER
(POINTS)	1	-1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	100 FT.	150 FT
(POINTS)	0	-1
9. INTERIOR FINISH	CLASS B	CLASS C
(POINTS)	1	-3
10. VERTICAL OPG.S	1/2-HR	1/2-HR
(POINTS)	0	0
11. SMOKE CONTROL	BARRIERS	NO BARR.
(POINTS)	2	0
S1	1.5	1.5
S2	7.5	3.5
S3	2	2
S4	6	1

2-STORY PROMPT OR SLOW LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES <NS>	(AS)
1.CONSTRUCTION	V(000) (SHEATHED)	V(000)
(POINTS)	-2	-6
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	WO/F.D. NOTIF	WO/F.D. NOTIF
(POINTS)	2	2
4. SMOKE DETEC.	INTER. CORR. SYS.	INTER. CORR. SYS.
(POINTS)	2	2
5. SPRINKLERS	NONE	TOTAL
(POINTS)	0	8
6. SEPERATION OF SLEEPING ROOMS	20 MIN. W/CLOSER	SMK.REST. W/O CLOSER
(POINTS)	2	-1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	100 FT.	150 FT
(POINTS)	0	-1
9. INTERIOR FINISH	CLASS B	CLASS C
(POINTS)	1	-3
10. VERTICAL OPG.S	1/2-HR	1/2-HR
(POINTS)	0	0
11. SMOKE CONTROL	BARRIERS	NO BARR.
(POINTS)	2	0
S1	2.5	1.5
S2	8	3.5
S3	3	2
S4	7	1

3-STORY PROMPT OR SLOW LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES <NS>	(AS)
1.CONSTRUCTION	III(211)	III(200) (SHEATHED)
(POINTS)	0	-2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	WO/F.D. NOTIF	WO/F.D. NOTIF
(POINTS)	2	2
4. SMOKE DETEC.	INTER. CORR. SYS.	INTER. CORR. SYS.
(POINTS)	2	2
5. SPRINKLERS	NONE	TOTAL
(POINTS)	0	8
6. SEPERATION OF SLEEPING ROOMS	20 MIN. W/CLOSER	SMK.REST. W/O CLOSER
(POINTS)	2	-1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	100 FT.	150 FT
(POINTS)	0	-1
9. INTERIOR FINISH	CLASS B	CLASS C
(POINTS)	1	-3
10. VERTICAL OPG.S	1/2-HR	1/2-HR
(POINTS)	0	0
11. SMOKE CONTROL	BARRIERS	NO BARR.
(POINTS)	2	0
S1	4.5	5.5
S2	8	3.5
S3	5	6
S4	9	5

4-STORY PROMPT OR SLOW LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES <NS>	(AS)
1.CONSTRUCTION	III(211)	III(200) (SHEATHED)
(POINTS)	0	-2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	WO/F.D. NOTIF	WO/F.D. NOTIF
(POINTS)	2	2
4. SMOKE DETEC.	INTER. CORR. SYS.	INTER. CORR. SYS.
(POINTS)	2	2
5. SPRINKLERS	NONE	TOTAL
(POINTS)	0	8
6. SEPERATION OF SLEEPING ROOMS	20 MIN. W/CLOSER	SMK.REST. W/O CLOSER
(POINTS)	2	-1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	100 FT.	150 FT
(POINTS)	0	-1
9. INTERIOR FINISH	CLASS B	CLASS C
(POINTS)	1	-3
10. VERTICAL OPG.S	1/2-HR	1/2-HR
(POINTS)	0	0
11. SMOKE CONTROL	BARRIERS	NO BARR.
(POINTS)	2	0
S1	4.5	5.5
S2	8	3.5
S3	5	6
S4	9	5

5/6-STORY PROMPT OR SLOW LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES <NS>	(AS)
1.CONSTRUCTION	III(211)	III(200) Sheathed
(POINTS)	0	-2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	WO/F.D. NOTIF	WO/F.D. NOTIF
(POINTS)	2	2
4. SMOKE DETEC.	INTER. CORR. SYS.	INTER. CORR. SYS.
(POINTS)	2	2
5. SPRINKLERS	NONE	TOTAL
(POINTS)	0	8
6. SEPERATION OF SLEEPING ROOMS	20 MIN. W/CLOSER	SMK.REST. W/O CLOSER
(POINTS)	2	-1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	100 FT.	150 FT
(POINTS)	0	-1
9. INTERIOR FINISH	CLASS B	CLASS C
(POINTS)	1	-3
10. VERTICAL OPG.S	1/2-HR	1/2-HR
(POINTS)	0	0
11. SMOKE CONTROL	BARRIERS	NO BARR.
(POINTS)	2	0
S1	4.5	5.5
S2	8	3.5
S3	5	6
S4	9	5

MORE THAN 6-STORY PROMPT OR SLOW LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES <NS>	(AS)
1.CONSTRUCTION	II(222)	IV(2HH)
(POINTS)	2	0
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	WO/F.D. NOTIF	WO/F.D. NOTIF
(POINTS)	2	2
4. SMOKE DETEC.	INTER. CORR. SYS.	INTER. CORR. SYS.
(POINTS)	2	2
5. SPRINKLERS	NONE	TOTAL
(POINTS)	0	8
6. SEPERATION OF SLEEPING ROOMS	20 MIN. W/CLOSER	SMK.REST. W/O CLOSER
(POINTS)	2	-1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	100 FT.	150 FT
(POINTS)	0	-1
9. INTERIOR FINISH	CLASS B	CLASS C
(POINTS)	1	-3
10. VERTICAL OPG.S	1/2-HR	1/2-HR
(POINTS)	0	0
11. SMOKE CONTROL	BARRIERS	NO BARR.
(POINTS)	2	0
S1	6.5	7.5
S2	8	3.5
S3	7	4
S4	11	7

NEW LARGE B&C FACILITY

PARAMETER	<= 2 Stories (AS)	>= 3 Stories (AS)
1.CONSTRUCTION	V(000)	II(111)
(POINTS)	-5	2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	W/F.D. NOTIF	W/F.D. NOTIF
(POINTS)	3	3
4. SMOKE DETEC.	INTER. BED RM/SUITE DET	INTER. BED RM/SUITE DET
(POINTS)	6	6
5. SPRINKLERS	TOTAL	TOTAL
(POINTS)	10	10
6. SEPERATION OF SLEEPING ROOMS	1/2 Walls 20 min Doors	1/2 Wall 20 min Doors
(POINTS)	2	2
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	>125 ft to <=250 ft	>125 ft to <=250 ft
(POINTS)	-1	-1
9. INTERIOR FINISH	CLASS A + B	CLASS A + B
(POINTS)	1	1
10. VERTICAL OPG.S	1/2-HR	>=1 HR
(POINTS)	0	1
11. SMOKE CONTROL	SMK BARRIERS	SMK BARRIERS
(POINTS)	2	2
S1	12	19.5
S2	17	18
S3	12	15
S4	18	26

TABLE 7.5.4B MANDATORY REQUIREMENTS - EXISTING LARGE FACILITIES

	CONTROL Sa	EGRESS Sb	REFUGE Sc	GENERAL Sd
<=2 STORIES	12	17	12	18
>=3 STORIES	19.5	18	15	26

TABLE 7.5.4B MANDATORY REQUIREMENTS - EXISTING LARGE FACILITIES

	CONTROL Sa	EGRESS Sb	REFUGE Sc	GENERAL Sd
PROMPT <=30				
1-STORY	1.5	7.5	2	6
PROMPT OR SLOW				
1-STORY	3.5	8	4	8
2-STORY	2.5	8	3	7
3-STORY	4.5	8	5	9
4-STORY	4.5	8	5	9
5/6-STORY	4.5	8	5	9
OVER 6-STORY	6.5	8	7	11

TABLE 7.5.4C MANDATORY REQUIREMENTS - EXISTING, SPRINKLER PROTECTED LARGE FACILITIES

	CONTROL Sa	EGRESS Sb	REFUGE Sc	GENERAL Sd
PROMPT <=30				
1-STORY	5.5	3.5	6	5
PROMPT OR SLOW				
1-STORY	5.5	3.5	6	5
2-STORY	1.5	3.5	2	1
3-STORY	5.5	3.5	6	5
4-STORY	5.5	3.5	6	5
5/6-STORY	5.5	3.5	6	5
OVER 6-STORY	7.5	3.5	4	7

1-STORY IMPRACTICAL LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES
1.CONSTRUCTION	V(000)
(POINTS)	-2
2. HAZARDOUS AREAS	NO DEF.S
(POINTS)	0
3. MANUAL F.A.	WO/F.D. NOTIF
(POINTS)	2
4. SMOKE DETEC.	InterSglStaBR/Suite
(POINTS)	3
5. SPRINKLERS	TOTAL
(POINTS)	8
6. SEPERATION OF SLEEPING ROOMS	SMK.REST. W/O CLOSER
(POINTS)	-1
7. EXIT SYSTEM	W/O HORZ.
(POINTS)	0
8. EXIT ACCESS	150 FT
(POINTS)	-1
9. INTERIOR FINISH	CLASS C
(POINTS)	-3
10. VERTICAL OPG.S	1/2-HR
(POINTS)	0
11. SMOKE CONTROL	BARRIERS
(POINTS)	2
S1	6
S2	6.5
S3	8.5
S4	8

2-STORY IMPRACTICAL LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES
1.CONSTRUCTION	V(000)
(POINTS)	-6
2. HAZARDOUS AREAS	NO DEF.S
(POINTS)	0
3. MANUAL F.A.	WO/F.D. NOTIF
(POINTS)	2
4. SMOKE DETEC.	InterSglStaBR/Suite
(POINTS)	3
5. SPRINKLERS	TOTAL
(POINTS)	8
6. SEPERATION OF SLEEPING ROOMS	SMK.REST. W/O CLOSER
(POINTS)	-1
7. EXIT SYSTEM	W/O HORZ.
(POINTS)	0
8. EXIT ACCESS	150 FT
(POINTS)	-1
9. INTERIOR FINISH	CLASS C
(POINTS)	-3
10. VERTICAL OPG.S	1/2-HR
(POINTS)	0
11. SMOKE CONTROL	BARRIERS
(POINTS)	2
S1	2
S2	6.5
S3	4.5
S4	4

3-STORY IMPRACTICAL LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES
1.CONSTRUCTION	III(200) (SHEATHED)
(POINTS)	-2
2. HAZARDOUS AREAS	NO DEF.S
(POINTS)	0
3. MANUAL F.A.	WO/F.D. NOTIF
(POINTS)	2
4. SMOKE DETEC.	InterSglStaBR/Suite
(POINTS)	3
5. SPRINKLERS	TOTAL
(POINTS)	8
6. SEPERATION OF SLEEPING ROOMS	SMK.REST. W/O CLOSER
(POINTS)	-1
7. EXIT SYSTEM	W/O HORZ.
(POINTS)	0
8. EXIT ACCESS	150 FT
(POINTS)	-1
9. INTERIOR FINISH	CLASS C
(POINTS)	-3
10. VERTICAL OPG.S	1/2-HR
(POINTS)	0
11. SMOKE CONTROL	BARRIERS
(POINTS)	2
S1	6
S2	6.5
S3	8.5
S4	8

4-STORY IMPRACTICAL LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES
1.CONSTRUCTION	III(200) (SHEATHED)
(POINTS)	-2
2. HAZARDOUS AREAS	NO DEF.S
(POINTS)	0
3. MANUAL F.A.	WO/F.D. NOTIF
(POINTS)	2
4. SMOKE DETEC.	InterSglStaBR/Suite
(POINTS)	3
5. SPRINKLERS	TOTAL
(POINTS)	8
6. SEPERATION OF SLEEPING ROOMS	SMK.REST. W/O CLOSER
(POINTS)	-1
7. EXIT SYSTEM	W/O HORZ.
(POINTS)	0
8. EXIT ACCESS	150 FT
(POINTS)	-1
9. INTERIOR FINISH	CLASS C
(POINTS)	-3
10. VERTICAL OPG.S	1/2-HR
(POINTS)	0
11. SMOKE CONTROL	BARRIERS
(POINTS)	2
S1	6
S2	6.5
S3	8.5
S4	8

5/6-STORY IMPRACTICAL LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES
1.CONSTRUCTION	III(200) Sheathed
(POINTS)	-2
2. HAZARDOUS AREAS	NO DEF.S
(POINTS)	0
3. MANUAL F.A.	WO/F.D. NOTIF
(POINTS)	2
4. SMOKE DETEC.	InterSglStaBR/Suite
(POINTS)	3
5. SPRINKLERS	TOTAL
(POINTS)	8
6. SEPERATION OF SLEEPING ROOMS	SMK.REST. W/O CLOSER
(POINTS)	-1
7. EXIT SYSTEM	W/O HORZ.
(POINTS)	0
8. EXIT ACCESS	150 FT
(POINTS)	-1
9. INTERIOR FINISH	CLASS C
(POINTS)	-3
10. VERTICAL OPG.S	1/2-HR
(POINTS)	0
11. SMOKE CONTROL	BARRIERS
(POINTS)	2
S1	6
S2	6.5
S3	8.5
S4	8

MORE THAN 6-STORY IMPRACTICAL LARGE B&C FACILITY

PARAMETER	EXISTING FACILITIES
1.CONSTRUCTION	IV(2HH)
(POINTS)	0
2. HAZARDOUS AREAS	NO DEF.S
(POINTS)	0
3. MANUAL F.A.	WO/F.D. NOTIF
(POINTS)	2
4. SMOKE DETEC.	InterSglStaBR/Suite
(POINTS)	3
5. SPRINKLERS	TOTAL
(POINTS)	8
6. SEPERATION OF SLEEPING ROOMS	SMK.REST. W/O CLOSER
(POINTS)	-1
7. EXIT SYSTEM	W/O HORZ.
(POINTS)	0
8. EXIT ACCESS	150 FT
(POINTS)	-1
9. INTERIOR FINISH	CLASS C
(POINTS)	-3
10. VERTICAL OPG.S	1/2-HR
(POINTS)	0
11. SMOKE CONTROL	BARRIERS
(POINTS)	2
S1	8
S2	6.5
S3	6.5
S4	10

TABLE 7.5.4D MANDATORY REQUIREMENTS - EXISTING, IMPRACTICAL LARGE FACILITIES

	CONTROL Sa	EGRESS Sb	REFUGE Sc	GENERAL Sd
Impractical				
1-STORY	6	6.5	8.5	8
2-STORY	2	6.5	4.5	4
3-STORY	6	6.5	8.5	8
4-STORY	6	6.5	8.5	8
5/6-STORY	6	6.5	8.5	8
OVER 6-STORY	8	6.5	6.5	10

FILE N101A06.XLS
FIRE SAFETY EVALUATION SYSTEM
SUITABILITY OF APARTMENT BUILDINGS FOR B&C OCCUPANCY
BASED ON 2012 LSC

EXISTING SPRINKLERED BUILDINGS

PARAMETER STORY & CLASS	1<31-PROMPT	1>30 PROMPT ANY NO. SLOW	1 STORY IMPRACTICAL	2 PROMPT OR SLOW
1.CONSTRUCTION	V(000)	V(000)	V(000)	V(000)
(POINTS)	-2	-2	-2	-6
2. HAZARDOUS AREAS	NO DEF.S		NO DEF.S	NO DEF.S
(POINTS)	0	0	0	0
3. MANUAL F.A.	W/O FD	W/O FD	W/O FD	W/O FD
(POINTS)	2	2	2	2
4. SMOKE DETEC.	S.S. LIV. UNITS ONLY	S.S. LIV. UNITS ONLY	S.S. LIV. UNITS ONLY	S.S. LIV. UNITS ONLY
(POINTS)	0	0	0	0
5. SPRINKLERS	TOATL	TOTAL	TOTAL	TOTAL
(POINTS)	8	8	8	8
6. SEPERATION OF B&C UNIT	SMK.REST. W/CLOSER	SMK.REST. W/CLOSER	SMK.REST. W/CLOSER	SMK.REST. W/CLOSER
(POINTS)	1	1	1	1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.	W/O HORZ.	W/O HORZ.
(POINTS)	0	0	0	0
8. EXIT ACCESS	100-200'	100-200'	100-200'	100-200'
(POINTS)	-1	-1	-1	-1
9. INTERIOR FINISH	CLASS C	CLASS C	CLASS C	CLASS C
(POINTS)	-3	-3	-3	-3
10. VERTICAL OPG.S	1/2 HR NOTE F	1/2 HR NOTE F	1/2 HR NOTE F	1/2 HR NOTE F
(POINTS)	1	1	1	1
11. SMOKE CONTROL	NONE	NONE	NONE	NONE
(POINTS)	0	0	0	0
S1	8.5	8.5	8.5	4.5
S2	3.5	3.5	3.5	3.5
S3	4	4	4	0
S4	6	6	6	2
S3 (n00) /const	8	8	8	4

EXISTING SPRINKLERED BUILDINGS

PARAMETER STORY & CLASS	2 STORY IMPRACTICAL	3-4 PROMP & SLOW	3 OR MORE IMPRACTICAL	5-6 PROMPT & SLOW
1.CONSTRUCTION	V(111)	V(000) SHEATHED	II(111) I(222)>6 STY	III(200)
(POINTS)	0	-2	2	-2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S	NO DEF.S	NO DEF.S
(POINTS)	0	0	0	0
3. MANUAL F.A.	W/O FD	W/O FD	W/O FD	W/O FD
(POINTS)	2	2	2	2
4. SMOKE DETEC.	S.S. LIV. UNITS ONLY	S.S. LIV. UNITS ONLY	S.S. LIV. UNITS ONLY	S.S. LIV. UNITS ONLY
(POINTS)	0	0	0	0
5. SPRINKLERS	TOATL	TOTAL	TOTAL	TOTAL
(POINTS)	8	8	8	8
6. SEPERATION OF B&C UNIT	SMK.REST. W/CLOSER	SMK.REST. W/CLOSER	SMK.REST. W/CLOOSER	SMK.REST. W/CLOOSER
(POINTS)	1	1	1	1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.	W/O HORZ.	W/O HORZ.
(POINTS)	0	0	0	0
8. EXIT ACCESS	100-200'	A00-200'	100-200'	100-200'
(POINTS)	-1	-1	-1	-1
9. INTERIOR FINISH	CLASS C	CLASS C	CLASS C	CLASS C
(POINTS)	-3	-3	-3	-3
10. VERTICAL OPG.S	1/2 HR NOTE F	1/2 HR NOTE F	1/2 HR NOTE F	1/2 HR NOTE F
(POINTS)	1	1	1	1
11. SMOKE CONTROL	NONE	NONE	NONE	NONE
(POINTS)	0	0	0	0
S1	10.5	8.5	12.5	8.5
S2	3.5	3.5	3.5	3.5
S3	6	4	8	4
S4	8	6	10	6
S3 (n00) /const	10	8	12	8

EXISTING SPRINKLERED BUILDINGS

PARAMETER STORY & CLASS	>6 PROMP & SLOW	>6 IMPRACTICAL
1.CONSTRUCTION	IV(2HH)	II(111) II(222)>6 STY
(POINTS)	0	2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S
(POINTS)	0	0
3. MANUAL F.A.	W/O FD	W/O FD
(POINTS)	2	2
4. SMOKE DETEC.	S.S. LIV. UNITS ONLY	S.S. LIV. UNITS ONLY
(POINTS)	0	0
5. SPRINKLERS	TOTAL	TOTAL
(POINTS)	8	8
6. SEPERATION OF B&C UNIT	SMK.REST. W/CLOSER	SMK.REST. W/CLOOSER
(POINTS)	1	1
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.
(POINTS)	0	0
8. EXIT ACCESS	150-200'	150-200'
(POINTS)	-1	-1
9. INTERIOR FINISH	CLASS C	CLASS C
(POINTS)	-3	-3
10. VERTICAL OPG.S	1/2 HR NOTE F	1/2 HR NOTE F
(POINTS)	1	1
11. SMOKE CONTROL	NONE	NONE
(POINTS)	0	0
S1	10.5	12.5
S2	3.5	3.5
S3	6	8
S4	8	10
S3 (n00) /const	10	12

FIRE SAFETY EVALUATION SYSTEM
SUITABILITY OF APARTMENT BUILDINGS FOR B&C OCCUPANCY

EXISTING NON SPRINKLERED

PARAMETER STORY & CLASS	1<31-PROMPT	1>30 PROMPT ANY NO. SLOW	1 STORY IMPRACTICAL	2 PROMPT OR SLOW
1.CONSTRUCTION	V(000)	V(000) SHEATHED	II(111)	V(111)
(POINTS)	-2	-1	2	0
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S	NO DEF.S	NO DEF.S
(POINTS)	0	0	0	0
3. MANUAL F.A.	W/O FD	W/O FD	W/O FD	W/O FD
(POINTS)	2	2	2	2
4. SMOKE DETEC.	NONE	NONE	NONE	NONE
(POINTS)	0	0	0	0
5. SPRINKLERS	NONE	NONE	NONE	NONE
(POINTS)	0	0	0	0
6. SEPERATION OF B&C UNIT	20 MIN W/CLOSER	20 MIN W/CLOSER	20 MIN W/CLOSER	20 MIN W/CLOSER
(POINTS)	-2	2	2	2
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.	W/O HORZ.	W/O HORZ.
(POINTS)	0	0	0	0
8. EXIT ACCESS	50-100'	50-100'	50-100'	50-100'
(POINTS)	1	1	1	1
9. INTERIOR FINISH	CLASS B	CLASS B	CLASS B	CLASS B
(POINTS)	-1	-1	-1	-1
10. VERTICAL OPG.S	1/2 HR NOTES F&B	1/2 HR NOTES F&B	1/2 HR NOTES F&B	1/2 HR NOTE F
(POINTS)	0	0	0	1
11. SMOKE CONTROL	BARRIER	BARRIER	BARRIER	BARRIER
(POINTS)	2	2	2	2
S1	-3	2	5	3.5
S2	3	5	5	6
S3	-2	3	6	5
S4	0	5	8	7
S3 (n00) /const	-2	3	6	5

FIRE SAFETY EVALUATION SYSTEM
SUITABILITY OF APARTMENT BUILDINGS FOR B&C OCCUPANCY

EXISTING NON SPRINKLERED

PARAMETER Story & Class	2 STORY IMPRACTICAL	3 & 6 STORY PROMP & SLOW	3 TO 6 STORY IMPRACTICAL	3 & 4 STORY IMPRACTICAL
1.CONSTRUCTION	II(111)	II(111)	II(111)	II(111)
(POINTS)	2	0	2	2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S	NO DEF.S	NO DEF.S
(POINTS)	0	0	0	0
3. MANUAL F.A.	W/O FD	W/O FD	W/O FD	W/O FD
(POINTS)	2	2	2	2
4. SMOKE DETEC.	NONE	NONE	NONE	NONE
(POINTS)	0	0	0	0
5. SPRINKLERS	NONE	NONE	NONE	NONE
(POINTS)	0	0	0	0
6. SEPERATION OF B&C UNIT	20 MIN W/CLOSER	20 MIN W/CLOSER	20 MIN W/CLOSER	20 MIN W/CLOSER
(POINTS)	2	2	2	2
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.	W/O HORZ.	W/O HORZ.
(POINTS)	0	0	0	0
8. EXIT ACCESS	50-100'	50-100'	50-100'	50-100'
(POINTS)	1	1	1	1
9. INTERIOR FINISH	CLASS B	CLASS B	CLASS B	CLASS B
(POINTS)	-1	-1	-1	-1
10. VERTICAL OPG.S	1/2 HR NOTE F	1/2 HR NOTE F	1/2 HR NOTE F	1/2 HR NOTE F
(POINTS)	1	1	1	1
11. SMOKE CONTROL	BARRIER	BARRIER	BARRIER	BARRIER
(POINTS)	2	2	2	2
S1	5.5	3.5	5.5	5.5
S2	6	6	6	6
S3	7	5	7	7
S4	9	7	9	9
S3 (n00) /const	7	5	7	7

FIRE SAFETY EVALUATION SYSTEM
SUITABILITY OF APARTMENT BUILDINGS FOR B&C OCCUPANCY

EXISTING NON SPRINKLERED

PARAMETER Story & Class	> 6 STORY PROMPT & SLOW
1.CONSTRUCTION	II(222)
(POINTS)	2
2. HAZARDOUS AREAS	NO DEF.S
(POINTS)	0
3. MANUAL F.A.	W/O FD
(POINTS)	2
4. SMOKE DETEC.	NONE
(POINTS)	0
5. SPRINKLERS	NONE
(POINTS)	0
6. SEPERATION OF B&C UNIT	30 MIN W/CLOSER
(POINTS)	2
7. EXIT SYSTEM	DIRECT
(POINTS)	4
8. EXIT ACCESS	50-100'
(POINTS)	1
9. INTERIOR FINISH	CLASS B
(POINTS)	-1
10. VERTICAL OPG.S	1/2 HR NOTE F
(POINTS)	1
11. SMOKE CONTROL	NONE
(POINTS)	0
S1	5.5
S2	8
S3	7
S4	11
S3 (n00) /const	7

FIRE SAFETY EVALUATION SYSTEM
SUITABILITY OF APARTMENT BUILDINGS FOR B&C OCCUPANCY

NEW BUILDINGS

PARAMETER STORY	1 Story	2 Stories	>= 3 Stories
1.CONSTRUCTION	V(000)	V(111)	II(111)
(POINTS)	-2	0	2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S	NO DEF.S
(POINTS)	0	0	0
3. MANUAL F.A.	W/O FD	W/O FD	W/O FD
(POINTS)	2	2	2
4. SMOKE DETEC.	NONE	NONE	NONE
(POINTS)	0	0	0
5. SPRINKLERS	TOTAL	TOTAL	TOTAL
(POINTS)	8	8	8
6. SEPERATION OF B&C UNIT	>=20 MIN W/CLOSER	>=20 MIN W/CLOSER	>=20 MIN W/CLOSER
(POINTS)	2	2	2
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.	W/O HORZ.
(POINTS)	0	0	0
8. EXIT ACCESS	100-200'	100-200'	100-200'
(POINTS)	-1	-1	-1
9. INTERIOR FINISH	CLASS C	CLASS C	CLASS C
(POINTS)	-3	-3	-3
10. VERTICAL OPG.S	<1-HR	1-HR	1-HR
(POINTS)	0	1	1
11. SMOKE CONTROL	NONE	NONE	NONE
(POINTS)	0	0	0
S1	9	11.5	13.5
S2	3	4	4
S3	4	7	9
S4	6	9	11
S3 (n00) /const	8	11	13

EXCEPTION 30.3.5.2

PARAMETER STORY &	1 Story	2 Stories	>= 3 Stories
1.CONSTRUCTION	V(000)	V(111)	II(111)
(POINTS)	-2	0	2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S	NO DEF.S
(POINTS)	0	0	0
3. MANUAL F.A.	W/O FD	W/O FD	W/O FD
(POINTS)	2	2	2
4. SMOKE DETEC.	NONE	NONE	NONE
(POINTS)	0	0	0
5. SPRINKLERS	NONE	NONE	NONE
(POINTS)	0	0	0
6. SEPERATION OF B&C UNIT	20 MIN W/CLOSER	20 MIN W/CLOSER	20 MIN W/CLOSER
(POINTS)	4	4	4
7. EXIT SYSTEM	DIRECT	DIRECT	DIRECT
(POINTS)	4	4	4
8. EXIT ACCESS	<=50 ft	<=50 ft	<=50 ft
(POINTS)	2	2	2
9. INTERIOR FINISH	CLASS A	CLASS A	CLASS A
(POINTS)	0	0	0
10. VERTICAL OPG.S	<1 HR	<1 HR	<1 HR
(POINTS)	0	1	1
11. SMOKE CONTROL	NONE	NONE	NONE
(POINTS)	0	0	0
S1	3	5.5	7.5
S2	10	11	11
S3	4	7	9
S4	10	13	15
S3 (n00) /const	4	7	9

FIRE SAFETY EVALUATION SYSTEM

SUITABILITY OF APARTMENT BUILDINGS FOR B&C OCCUPANCY

EXISTING SPRINKLERED APARTMENTS

PARAMETER STORY	1 Story	2 Stories	3 Stories	
1.CONSTRUCTION	V(000)	V(111)	II(111)	
(POINTS)	-1	0	2	
2. HAZARDOUS AREAS	NONE	NONE	NONE	
(POINTS)	0	0	0	
3. Fire Alarm	W/ Notif	W/ Notif	W/ Notif	
(POINTS)	3	3	3	
4. SMOKE DETEC.	NONE	NONE	NONE	
(POINTS)	0	0	0	
5. SPRINKLERS	TOTAL	TOTAL	TOTAL	
(POINTS)	8	8	8	
6. SEPERATION OF B&C UNIT	<20 MIN W/CLOSER	<20 MIN W/CLOSER	<20 MIN W/CLOSER	
(POINTS)	1	1	1	
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.	W/ HORZ.	
(POINTS)	0	0	0	
8. EXIT ACCESS	<=50 ft	<=50 ft	<=50 ft	
(POINTS)	-1	-1	-1	
9. INTERIOR FINISH	CLASS A	CLASS A	CLASS A	
(POINTS)	-1	-1	-1	
10. VERTICAL OPG.S	<1-HR	1-HR	1-HR	
(POINTS)	0	0	0	<12 units
11. SMOKE CONTROL	SMK Barriers	SMK Barriers	SMK Barriers	
(POINTS)	2	2	2	
S1	9.5	10.5	12.5	
S2	7.5	7.5	7.5	
S3	6	7	9	
S4	11	12	14	
S3 (n00) /const	10	11	13	

FIRE SAFETY EVALUATION SYSTEM

SUITABILITY OF APARTMENT BUILDINGS FOR B&C OCCUPANCY

EXISTING NON-SPRINKLERED APARTMENTS

PARAMETER STORY	1 Story	2 Stories	>+ 3 Stories
1.CONSTRUCTION	II(111)	V(000)	V(000)
(POINTS)	2	-1	-2
2. HAZARDOUS AREAS	NO DEF.S	NO DEF.S	NO DEF.S
(POINTS)	0	0	0
3. MANUAL F.A.	W/O FD	W/O FD	W/O FD
(POINTS)	3	3	3
4. SMOKE DETEC.	S.S. LIV. UNITS ONLY	S.S. LIV. UNITS ONLY	S.S. LIV. UNITS ONLY
(POINTS)	2	2	2
5. SPRINKLERS	TOTAL	TOTAL	TOTAL
(POINTS)	0	8	8
6. SEPERATION OF B&C UNIT	20 MIN W/CLOSER	20 MIN W/CLOSER	20 MIN W/CLOSER
(POINTS)	1	2	2
7. EXIT SYSTEM	W/O HORZ.	W/O HORZ.	W/O HORZ.
(POINTS)	0	0	0
8. EXIT ACCESS	50-100'	50-100'	50-100'
(POINTS)	-1	1	-1
9. INTERIOR FINISH	CLASS B	CLASS B	CLASS B
(POINTS)	-1	-1	-3
10. VERTICAL OPG.S	<1-HR	<1-HR	1-HR
(POINTS)	0	0	1
11. SMOKE CONTROL	SMK BARRIERS	NONE	NONE
(POINTS)	2	0	0
S1	5.5	11.5	11
S2	5.5	10	7
S3	5	5	5
S4	8	14	10
S3 (n00) /const	5	9	9

7.7A Mandatory Requirements - Existing Apartment Buildings Housing Existing Board

Building Heigh	Evacuation Capability	Control Requirement	Egress Requirement	Refuge Requirement	General Fire Safety
1 Story	Prompt/Slow	2	5	3	5
	Impractical	5	5	6	8
2-6 Stories	Prompt/Slow	3.5	6	5	7
	Impractical	5.5	6	7	9
>6 Stories	Prompt/Slow	10.5	3.5	6	8
	Impractical	12.5	3.5	8	10

7.7B Mandatory Requirements - New Apartment Buildings

Building Heigh	Control Requirement	Egress Requirement	Refuge Requirement	General Fire Safety
1 Story	9	3	4	6
2 Stories	11.5	4	7	9
>=3 Stories	13.5	4	9	11

7.7C Mandatory Requirements - New Nonsprinklered Apartment Buildings Meeting Exception to 30.3.5.2

Building Heigh	Control Requirement	Egress Requirement	Refuge Requirement	General Fire Safety
1 Story	3	10	4	10
2 Stories	5.5	11	7	13
>=3 Stories	7.5	11	9	15

7.7D Mandatory Requirements - New Board and Care Facilities in Existing Apartment Buildings

Building Heigh	Control Requirement	Egress Requirement	Refuge Requirement	General Fire Safety
1 Story	9.5	7.5	6	11
2 Stories	10.5	7.5	7	12
>=3 Stories	12.5	7.5	9	14

FILE N101A06.XLS
Fire Safety Evaluation System Mandatory Values

BUSINESS OCCUPANCIES
BASED ON 2012 LSC

1 Story

	NEW	EXISTING
1. Construction	Type V (000)	Type V (000)
	-1	-1
2. Segregation of Hazards	No Deficiencies	No Deficiencies
	0	0
3. Vertical Openings	Enclosed <30 minutes	Enclosed <30 minutes
	0	0
4. Sprinklers	None	None
	0	0
5. Manual Fire Fire Alarm	None	None
	0	0
6. Smoke Detection & Alarm	None	None
	0	0
7. Interior Finish Exit Routes	>25 <75	>25 <75
Room Suites	>75 <200	>75 <200
	0	0
8. Smoke Control	None	None
	0	0
9. Exit Access	100 - 200 ft	100 - 200 ft
	0	0
10. Exit System	Multi. Rtes	Multi. Rtes
	0	0
11. Corridor/Room Separation	1 hour w/ door closers	No Separation
	3	0
12. Occupant Emergency Program	1 to 2 Drills per Year	1 to 2 Drills per Year
	0	0

TOTALS		
Fire Control	0.5	-1
Egress Provided	1.5	0
General Fire Safety	2	-1

	2 Stories	
	NEW	EXISTING
1. Construction	Type V (000) -4	Type V (000) -4
2. Segregation of Hazards	No Deficiencies 0	No Deficiencies 0
3. Vertical Openings	Enclosed 30 min to 1 hr 0	Enclosed 30 min to 1 hr 0
4. Sprinklers	None 0	None 0
5. Manual Fire Fire Alarm	None 0	None 0
6. Smoke Detection & Alarm	None 0	None 0
7. Interior Finish Exit Routes Room Suites	 >25 <75 >75 <200 0	 >25 <75 >75 <200 0
8. Smoke Control	None 0	None 0
9. Exit Access	100 - 200 ft 0	100 - 200 ft 0
10. Exit System	Multi. Rtes 0	Multi. Rtes 0
11. Corridor/Room Separation	1 hour w/ door closers 3	No Separation 0
12. Occupant Emergency Program	1 to 2 Drills per Year 0	1 to 2 Drills per Year 0
TOTALS		
Fire Control	-2.5	-4
Egress Provided	1.5	0
General Fire Safety	-1	-4

Fire Safety Evaluation System Mandatory Values

3 Stories

	NEW		EXISTING	
1. Construction	Type V (111)	0	Type V (111)	0
2. Segregation of Hazards	No Deficiencies	0	No Deficiencies	0
3. Vertical Openings	Enclosed 30 min to 1 hr	0	Enclosed 30 min to 1 hr	0
4. Sprinklers	None	0	None	0
5. Manual Fire Fire Alarm	w/o Fire Dept. Notification	0	w/o Fire Dept. Notification	0
6. Smoke Detection & Alarm	None	0	None	0
7. Interior Finish Exit Routes	>25 <75		>25 <75	
Room Suites	>75 <200	0	>75 <200	0
8. Smoke Control	None	0	None	0
9. Exit Access	100 - 200 ft	0	100 - 200 ft	0
10. Exit System	Multi. Rtes	0	Multi. Rtes	0
11. Corridor/Room Separation	1 hour w/ door closers	3	No Separation	0
12. Occupant Emergency Program	1 to 2 Drills per Year	0	1 to 2 Drills per Year	0
TOTALS				
Fire Control		1.5		0
Egress Provided		1.5		0
General Fire Safety		3		0

Fire Safety Evaluation System Mandatory Values

	4 - 5 Stories NEW	EXISTING
1. Construction	Type II (111) 2	Type II (111) 2
2. Segregation of Hazards	No Deficiencies 0	No Deficiencies 0
3. Vertical Openings	Enclosed 1 hr or more 1	Enclosed 30 min to 1 hr 0
4. Sprinklers	None 0	None 0
5. Manual Fire Fire Alarm	w/o Fire Dept. Notification 0	w/o Fire Dept. Notification 0
6. Smoke Detection & Alarm	None 0	None 0
7. Interior Finish Exit Routes Room Suites	 >25 <75 >75 <200 0	 >25 <75 >75 <200 0
8. Smoke Control	None 0	None 0
9. Exit Access	100 - 200 ft 0	100 - 200 ft 0
10. Exit System	Multi. Rtes 0	Multi. Rtes 0
11. Corridor/Room Separation	1 hour w/ door closers 3	No Separation 0
12. Occupant Emergency Program	1 to 2 Drills per Year 0	1 to 2 Drills per Year 0
TOTALS		
Fire Control	4	2
Egress Provided	2.5	0
General Fire Safety	6	2

Fire Safety Evaluation System Mandatory Values

	> 75 ft and < 150 ft NEW	EXISTING
1. Construction	Type II (111) -1	Type II (111) -1
2. Segregation of Hazards	No Deficiencies 0	No Deficiencies 0
3. Vertical Openings	Enclosed 1 hr or more 1	Enclosed 30 min to 1 hr 0
4. Sprinklers	Total Building 10	Total Building 10
5. Manual Fire Fire Alarm	w/o Fire Dept. Notification 0	w/o Fire Dept. Notification 0
6. Smoke Detection & Alarm	None 0	None 0
7. Interior Finish		
Exit Routes	>75 <200	>75 <200
Room Suites	>75 <200 -3	>75 <200 -3
8. Smoke Control	None 0	None 0
9. Exit Access	100 - 200 ft 0	100 - 200 ft 0
10. Exit System	Multi. Rtes 0	Multi. Rtes 0
11. Corridor/Room Separation	1 hour w/ door closers 3	No Separation 0
12. Occupant Emergency Program	1 to 2 Drills per Year 0	1 to 2 Drills per Year 0
TOTALS		
Fire Control	9.5	7.5
Egress Provided	7.5	5
General Fire Safety	10	6

Fire Safety Evaluation System Mandatory Values

	> 150 ft NEW	EXISTING
1. Construction	Type II (222) 2	Type II (222) 2
2. Segregation of Hazards	No Deficiencies 0	No Deficiencies 0
3. Vertical Openings	Enclosed >1 hr or more 1	Enclosed 30 min to 1 hr 0
4. Sprinklers	Total Building 10	Total Building 10
5. Manual Fire Fire Alarm	w/o Fire Dept. Notification 0	w/o Fire Dept. Notification 0
6. Smoke Detection & Alarm	None 0	None 0
7. Interior Finish		
Exit Routes	>75 <200	>75 <200
Room Suites	>75 <200	>75 <200
	-3	-3
8. Smoke Control	None 0	None 0
9. Exit Access	100 - 200 ft 0	100 - 200 ft 0
10. Exit System	Multi. Rtes 0	Multi. Rtes 0
11. Corridor/Room Separation	1 hour w/ door closers 3	No Separation 0
12. Occupant Emergency Program	1 to 2 Drills per Year 0	1 to 2 Drills per Year 0
TOTALS		
Fire Control	12.5	10.5
Egress Provided	7.5	5
General Fire Safety	13	9

Mandatory Requirements

	Control Requirement		Egress Requirement		General Fire Safety	
Building Height	New	Existing	New	Existing	New	Existing
1 Story	0.5	-1	1.5	0	2	-1
2 Stories	-2.5	-4	1.5	0	-1	-4
3 Stories	1.5	0	1.5	0	3	0
> 3 Stories and <=75 ft	4	2	2.5	0	6	2
>75 ft and < 150 ft	9.5	7.5	7.5	5	10	6
>=150 ft	12.5	10.5	7.5	5	13	9

FILE N101A06.XLS

Fire Safety Evaluation System Mandatory Values

EDUCATION OCCUPANCIES

BASED ON 2012 LSC

1 Story

	NEW	EXISTING
1. Construction	Type V (000) 1	Type V (000) 1
2. Segregation of Hazards	No Deficiencies 0	No Deficiencies 0
3. Vertical Openings	Enclosed <30 minutes 1	Enclosed <30 minutes 1
4. Sprinklers	None 0	None 0
5. Detection, Alarm, and and Communications	Man. w/Occ Not 0	Man. w/Occ Not 0
6. Emergency Forces Notification	Automatic 1	Administrative 0
7. Interior Finish in Exits	<=25 0	<= 25 0
8. Interior Finish in Corridors and Lobbies	>25 <=75 -2	>25 <=75 -2
9. Interior Finish in Rooms	>25 <=75 -1	>75 <=200 -2
10. Exit Access Corridor	50 - 150 ft 0	50 - 150 ft 0
11. Egress Routes	Multi. Routes 0	Multi. Routes 0
12. Corridor/Room Separation	1 hour 20 min door 2	1/2 hour Solid core door 1
13. Smoke Control	Passive	Passive

	0	0
14. Occupant Emergency Program	>1 per month 0	>1 per month 0
TOTALS		
Fire Control	2.5	0.5
Egress Provided	2	1.5
General Fire Safety	2	-1

		2 Stories	
		NEW	EXISTING
1.	Construction	Type V (111) 1	Type V (111) 1
2.	Segregation of Hazards	No Deficiencies 0	No Deficiencies 0
3.	Vertical Openings	Enclosed >=1 hour 2	Enclosed <30 minutes 1
4.	Sprinklers	None 0	None 0
5.	Detection, Alarm, and and Communications	Man. w/Occ Not 0	Man. w/Occ Not 0
6.	Emergency Forces Notification	Automatic 1	Administrative 0
7.	Interior Finish in Exits	<=25 0	<= 25 0
8.	Interior Finish in Corridors and Lobbies	>25 <=75 -2	>25 <=75 -2
9.	Interior Finish in Rooms	>25 <=75 -1	>75 <=200 -2
10.	Exit Access Corridor	50 - 150 ft 0	50 - 150 ft 0
11.	Egress Routes	Multi. Routes 0	Multi. Routes 0
12.	Corridor/Room Separation	1 hour 20 min door 2	1/2 hour Solid core door 1
13.	Smoke Control	Passive 0	Passive 0
14.	Occupant Emergency Program	>1 per month 0	>1 per month 0

TOTALS		
Fire Control	3.5	0.5
Egress Provided	3	1.5
General Fire Safety	3	-1

	3 Stories	
	NEW	EXISTING
1. Construction	Type V (111) 0	Type V (111) 0
2. Segregation of Hazards	No Deficiencies 0	No Deficiencies 0
3. Vertical Openings	Enclosed >= 1 hour 2	Enclosed <30 minutes 1
4. Sprinklers	None 0	None 0
5. Detection, Alarm, and and Communications	Man. w/Occ Not 0	Man. w/Occ Not 0
6. Emergency Forces Notification	Automatic 1	Administrative 0
7. Interior Finish in Exits	<=25 0	<= 25 0
8. Interior Finish in Corridors and Lobbies	>25 <=75 -2	>25 <=75 -2
9. Interior Finish in Rooms	>25 <=75 -1	>75 <=200 -2
10. Exit Access Corridor	50 - 150 ft 0	50 - 150 ft 0
11. Egress Routes	Multi. Routes 0	Multi. Routes 0
12. Corridor/Room Separation	1 hour 20 min door 2	1/2 hour Solid core door 1
13. Smoke Control	Passive 0	Passive 0
14. Occupant Emergency Program	>1 per month 0	>1 per month 0

TOTALS		
Fire Control	2.5	-0.5
Egress Provided	3	1.5
General Fire Safety	2	-2

	>=4 Sto ries not High Rise	
	NEW	EXISTING
1. Construction	Type II (222) 2	Type II (222) 2
2. Segregation of Hazards	No Deficiencies 0	No Deficiencies 0
3. Vertical Openings	Enclosed >= 1 hour 2	Enclosed <30 minutes 1
4. Sprinklers	None 0	None 0
5. Detection, Alarm, and and Communications	Man. w/Occ Not 0	Man. w/Occ Not 0
6. Emergency Forces Notification	Automatic 1	Administrative 0
7. Interior Finish in Exits	<=25 0	<= 25 0
8. Interior Finish in Corridors and Lobbies	>25 <=75 -2	>25 <=75 -2
9. Interior Finish in Rooms	>25 <=75 -1	>75 <=200 -2
10. Exit Access Corridor	50 - 150 ft 0	50 - 150 ft 0
11. Egress Routes	Multi. Routes 0	Multi. Routes 0
12. Corridor/Room Separation	1 hour 20 min door 2	1/2 hour Solid core door 1
13. Smoke Control	Passive 0	Passive 0
14. Occupant Emergency Program	>1 per month 0	>1 per month 0

TOTALS		
Fire Control	4.5	1.5
Egress Provided	3	1.5
General Fire Safety	4	0

Mandatory Requirements

	Control Requirement		Egress Requirement	
Building Height	New	Existing	New	Existing
1 Story	2.5	0.5	2	1.5
2 Stories	3.5	0.5	3	1.5
3 Stories	2.5	-0.5	3	1.5
>=4 Stories but not high rise	4.5	1.5	3	1.5