

2.4 Design and Construction Requirements

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 2.4-1 General

2.4-1.1 Application

2.4-1.1.1 This chapter contains elements that are common to most types of residential health, care, and support facilities. The elements are required only when referenced in a common element or specific facility chapter in Part 3 (Residential Health Facilities), Part 4 (Residential Care and Support Facilities), and Part 5 (Non-Residential Support Facilities).

2.4-1.1.2 Additional specific requirements are located in the facility chapters in Parts 3, 4, and 5. Consult the facility chapters to determine whether elements in this chapter are required.

2.4-1.2 Building Codes and Standards

2.4-1.2.1 Building Codes

All parts of a residential health, care, and support facility shall be designed and constructed in accordance with applicable building codes; engineering practices and standards; and applicable sections of NFPA 101: *Life Safety Code*®.

2.4-1.2.2 Construction Requirements

2.4-1.2.2.1 Interior finishes. Interior finish materials used for architectural details, surfaces, and furnishings shall comply with the flame-spread limitations and smoke-production limitations in NFPA 101.

2.4-1.2.2.2 Insulation materials. Building insulation materials, unless sealed on all sides and edges with noncombustible material, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 150 or less when tested in accordance with NFPA 255: *Standard Method of Test of Surface Burning Characteristics of Building Materials*.

■ 2.4-2 Architectural Details, Surfaces, and Furnishings

2.4-2.1 General

2.4-2.1.1 Application

2.4-2.1.1.1 Applicable standards

- ***(1)** All materials and products selected and specified for residential health, care, and support facility design and construction projects shall meet local, state, and federal regulations and industry standards for infection control and assembly or construction.
- (2)** National testing standards shall be used to verify whether a product or material provides specific characteristics.

***2.4-2.1.1.2** Selected materials and products shall comply with application and use requirements and shall support the findings of the resident safety risk assessment (RSRA) and model of care, which are documented in the functional program.

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A2.4-2.1.1.1 (1) For additional information, see the white paper “Resources for Selecting Architectural Details, Surfaces, and Furnishings for Health Care Facilities” posted on the FGI website.

A2.4-2.1.1.2 Selection of finishes and materials for furnishings should include resident input based on the model of care.

*2.4-2.1.2 Characteristics and Criteria for Selecting Materials and Products

***2.4-2.1.2.1 General.** The effect of surface materials, colors, textures, and patterns on resident, staff, and

A2.4-2.1.2 The effects of demolition and replacement and repair of materials and products used in residential health, care, and support facilities should be considered when selecting surface and furnishing materials and products for use in environments that are occupied 24 hours a day, seven days a week.

A2.4-2.1.2.1 Characteristics and criteria for selecting surface and furnishing materials and products

a. Residential health, care, and support facilities should incorporate architectural detail, surface, and furnishing materials and products that:

- Optimize sensory function in accordance with the vision and lighting guidelines established by ANSI/IES RP-28: *Recommended Practice for Lighting and the Visual Environment for Senior Living* and provide optimum light levels and glare-free finishes for the safety and vision comfort of residents and staff.
- Optimize acoustic comfort, acoustic privacy, and accurate oral communications; mitigate alarm fatigue, and consider residents' use of hearing aids.

b. The additional characteristics and criteria in this section should be used for designing architectural details and selecting and specifying products and materials for all residential health, care, and support facility design and construction projects. (The characteristics included in this text are supported by quantifiable industry test methods. See the Facility Guidelines Institute website at www.fgiguideelines.org/resources for more information.)

—*Durable.* Architectural detail, surface, and furnishing materials and products should be resistant to breakage, punctures/tears, stains, and damage and wear from abrasion as appropriate to the function of the material and product type being selected. See appendix section A2.2-2.5.1.3 (Reduced-impact materials) for additional information.

—*Resilient and impact-resistant.* Architectural detail, surface, and furnishing materials should remain intact, safe, and functional in heavy weight-bearing, high-traffic, and impact-susceptible areas. Materials and products selected should meet the following requirements:

- “Pounds per square inch” (PSI) weight tolerances for loads
- Tensile strength, flexibility, impact, and abrasion testing standards for the required use and application
- Surface bounces back from compressions caused by repeated use and does not shatter or fragment under abrasion or impact

—*Reduces user fatigue and musculoskeletal injury.* Architectural detail, surface, and furnishing materials should:

- Meet specific safety, assembly, and construction industry criteria for flexibility to address foot compression and heel strike absorption.

- Support foot comfort and reduce the fatigue and musculoskeletal injury effects of long-term continued use or bodily damage from impacts or falls.
- Uses safe and compatible materials in assemblies, including substrate and surface finish materials*
 - All assembled materials should meet the characteristics listed in Sections 2.4-2.2 (Architectural Details), 2.4-2.3 (Surfaces), and 2.4-2.4 (Furnishings).
 - All seams and joints in assemblies should be joined to reduce wear and degradation and should be able to remain intact during the proposed service life of the assembly.
 - Water-resistant materials, sealed-seam construction methods, and moisture-impervious surface selections should be used for assemblies where water or moisture is continuously present (e.g., clinical use work surfaces with inset or integral sinks, flooring, cove base assemblies, showers, other bathing areas) to reduce or eliminate the possibility of seepage in or under the assembly.
- Safe and efficient for use in occupied residential settings over time.* Throughout their life cycle, architectural detail, surface, and furnishing materials and products should minimize and/or prevent the incidence and effects of noise, odors, gas, particulates, dust, and debris that reduce indoor air quality during product assembly, installation, and operations as well as maintenance, repair, or demolition in occupied residential health, care, and support facilities. See appendix section A2.2-2.4.1.1 (Emissions and VOCs) for additional information.
- Appropriate for the emotional and cultural well-being of residents, staff, and visitors.* Design, layout, size, color, and pattern of architectural details, surfaces, and furnishings shall create resident environments that support the model of care and operations provided in the facility or setting. See Section 1.2-4.5.8 (Cultural Responsiveness) for additional information
 - In any design project, the selection of a color palette should be based on many factors, including the building population, anticipated activities in the space, and lighting design strategy.
 - Finishes and color palettes should respond to the geographic location of the residential health, care, and support facility, taking into account climate and light, regional responses to color, and the cultural characteristics of the community served.
- Has acoustic properties that support resident safety and well-being.* Material and products selected should meet the noise reduction requirements for resident care areas in Section 2.5-8.3 (Design Criteria for Acoustic Finishes) and Section 2.5-8.6 (Design Guidelines for Speech Privacy) where applicable to the

visitor safety and on maintenance and life cycle performance shall be considered in the overall planning and design of the facility.

2.4-2.1.2.2 Resident safety risk assessment issues.

Architectural detail, surface, and furnishing materials and products selected for residential health, care, and support facilities and settings shall meet performance characteristics and criteria to address risks identified in the resident safety risk assessment results.

- *(1) Reduction of resident falls and associated injuries. See Section 1.2-3.4 (Resident Fall Risk and Prevention) and Section 2.4-2.3.2 (Flooring and Wall Bases) for requirements.
- (2) Reduction of medication errors. If medication areas are provided in the facility or setting, medication work surfaces shall be designed to reduce glare and reflectivity.

2.4-2.2 Architectural Details

2.4-2.2.1 General

Architectural details in residential health, care, and support facilities shall be designed to encourage

ambulation of long-term residents, short-term rehabilitation residents, and participants in non-residential settings.

2.4-2.2.2 Corridors

2.4-2.2.2.1 Width. The placement of drinking fountains, public telephones, vending machines, and wall-mounted items such as organizers, retractable computer workstations, etc., shall not restrict corridor traffic or reduce the corridor width below the minimum stipulated in applicable building codes and NFPA 101.

2.4-2.2.2.2 Placement of fixtures. The height of drinking fountains, public telephones, handrails, lean rails, and wall-mounted lighting fixtures shall comply with applicable accessibility standards referenced in Section 1.1-4.1 (Design Standards for Accessibility).

2.4-2.2.3 Ceiling Height

***2.4-2.2.3.1** The minimum ceiling height shall be 8 feet (2.44 meters), with the following exceptions:

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function of the specific material or product.

—*Made of non-allergenic materials.* A product review of potential product-based allergens should be performed during the material selection process (conducted during functional programming) to identify products inappropriate for use with the resident care population being served.

—*Ability to control and minimize reflectivity and glare.*

Architectural details, surfaces and furnishing materials and light fixtures and lamps that are specified should combine to meet ANSI/IES RP-28: *Recommended Practices for Lighting and the Visual Environment for Senior Living* light levels. See Section 2.5-7 (Daylighting and Artificial Lighting Systems) for additional information.

—*Has low or no volatile organic compounds.* Only materials with low or no volatile organic compounds (VOCs) should be used. See Section 2.2-2.4.1.1 (Emissions and VOCs) for additional information.

A2.4-2.1.2.2 (1) Environmental factors and falls.

A number of studies in which multiple variables were studied have suggested an association between falls and the following material characteristics:

- a. Flooring types (e.g., carpet; non-textile flooring such as rubber, VCT, sheet vinyl). Flooring should be specified based on function.
- b. Flooring pattern. Scale and type of flooring design patterns should be considered. Research suggests that flooring with a medium-sized pattern (1–6 inches wide) was associated with more falls than floors with no pattern, a small pattern (less than 1 inch wide), or a large pattern (wider than 6 inches).
- c. Flooring contrast. Flooring materials with high-contrast patterns can be associated with more falls.
- d. Flooring resilience. Use of flooring material that is flexible and “gives” should be reviewed to reduce injury to residents who fall.
- e. Floor reflectivity. Use of non-glare finished floors should be considered to avoid compromising vision and potentially disrupting balance of residents.
- f. Flooring cushioning. Floors should be firm enough so they do not disrupt gait and posture or inhibit roller traffic.
- g. Noise attenuation should be considered. Noise has been found to contribute to falls, especially noise generated from overhead paging and alarms.

A2.4-2.2.3.1 Because indirect lighting solutions should be considered for residential health, care, and support facilities, higher ceiling heights may be needed to accommodate the indirect lighting detailing.

- *(1) The minimum ceiling height in corridors and normally unoccupied spaces shall be 7 feet 6 inches (2.29 meters).
- (2) In rooms containing ceiling-mounted equipment or fixtures in the stowed position, the minimum height from the floor to the lowest protruding element of the equipment or fixture when it is in the stowed position shall be 7 feet (2.14 meters).
- (3) The minimum height above the floor of suspended tracks, rails, and pipes located in normal traffic paths shall be 7 feet 6 inches (2.29 meters) above the floor.

2.4-2.2.3.2 Renovation. In renovation projects, all new work shall comply with the requirements in Section 2.4-2.2.3 (Ceiling Height). Where existing conditions make compliance impossible, the authority having jurisdiction (AHJ) shall be permitted to grant approval to deviate from these requirements.

2.4-2.2.4 Doors and Door Hardware

See common element and facility chapters in Parts 3 through 5 for requirements in addition to those in this section.

2.4-2.2.4.1 Reserved

2.4-2.2.4.2 Door openings

- (1) Door openings shall be sized based on the model of care and the needs of the care population to allow proper clearance for:
 - (a) Ambulation of residents
 - (b) Passage of the following:
 - (i) Portable/mobile mechanical lifts
 - (ii) Shower gurney devices
 - (iii) Shower chairs
 - (iv) Equipment
 - (v) Beds
 - (vi) Resident-operated mobility devices
 - (vii) Carts
- (2) Architecturally framed and trimmed openings in corridors and rooms shall be permitted, provided a

minimum height of 6 feet 8 inches (2.03 meters) is maintained.

2.4-2.2.4.3 Door protection. Door protection (e.g., kick plates, edge stripping, etc.) shall be provided to accommodate the model of care and the needs of the care population.

2.4-2.2.4.4 Insect screens

- (1) A door that opens to the exterior and may be opened for ventilation purposes, with the exception of an approved exit door, shall be effectively covered with screening.
- (2) Where regionally appropriate, this requirement shall not apply.

2.4-2.2.5 Thresholds and Expansion Joint Covers

2.4-2.2.5.1 Thresholds shall be designed to facilitate use by rolling traffic.

2.4-2.2.5.2 Thresholds, expansion/seismic joints, and covers shall meet all local, state, and federal requirements.

2.4-2.2.6 Windows

2.4-2.2.6.1 General

- (1) Windows shall comply with applicable building codes.
- (2) Resident rooms, suites, and dwelling units shall have exterior window(s).
- (3) See Section 2.2-4.2.1.6 (Physical Environment Elements for Risk Reduction—Operable windows) for requirements that address safety risks for residents with dementia, mental health diagnoses, and cognitive and developmental disabilities.
- (4) For requirements in addition to those in this section, see:
 - (a) Common element and facility chapters in Parts 3 through 5 for additional requirements.
 - (b) Section 1.2-4.5.1 (Light)

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A2.4-2.2.3.1 (1) Examples of normally unoccupied rooms/spaces include toilet, storage, dressing, soiled utility, clean utility, environmental service, electrical, and information technology rooms and alcoves.

(c) Section 2.5-7 (Daylighting and Artificial Lighting Systems)

2.4-2.2.6.2 Sill height. Windows in resident rooms, suites, and dwelling units shall have sills located no higher than 32 inches (81.28 centimeters) above the finished floor.

2.4-2.2.6.3 Insect screens

- (1) Operable exterior windows that may be left open shall have insect screens.
- (2) Where regionally appropriate, this requirement shall not apply.

2.4-2.2.7 Glazing Materials

- (1) Glazing materials shall meet all local, state, and federal requirements.
- (2) Glazing materials shall be readily accessed for cleaning and maintenance.

2.4-2.2.8 Hand-Washing Stations

2.4-2.2.8.1 General. If hand-washing stations are provided in a residential health, care, or support facility, the requirements in this section shall be met.

- (1) The number and placement of hand-washing stations shall be determined by the infection control risk assessment (ICRA).
- (2) Hand sanitation dispensers shall be permitted to be used in lieu of hand-washing stations as determined by the ICRA.
- (3) Hand-washing stations in resident care areas shall be located so they are visible and access to them is unobstructed.
- (4) Design of hand-washing stations shall not permit storage in casework beneath the sink basin or in areas below a sink open to the floor.

2.4-2.2.8.2 Sinks. For sink and fitting requirements, see Section 2.5-2.3.2 (Hand-Washing Sinks).

2.4-2.2.8.3 Anchorage. For hand-washing stations, allowable stresses shall not be exceeded at any point on the hand-washing station where a vertical or horizontal force of 250 pounds (1112N) is applied.

2.4-2.2.8.4 Hand-washing station countertops

- (1) Hand-washing station countertops and their substrates shall be moisture-resistant.
- *(2) Hand-washing sinks set into countertops shall include a water-tight seal.

2.4-2.2.8.5 Provisions for drying hands. Provisions for hand drying shall be required at all hand-washing stations.

- (1) Hand-washing stations shall include a hand-drying device that does not require hands to contact the dispenser.
- (2) These provisions shall be enclosed to protect against dust or soil and to ensure single-unit dispensing.
- (3) Hot air dryers shall be permitted unless the care population dictates otherwise. See Section 2.2-4 (Design Criteria for Dementia, Mental Health, and Cognitive and Developmental Disability Facilities) for specific care population requirements.
- (4) If provided, hand towels shall be directly accessible to sinks.

2.4-2.2.8.6 Cleansing agent. Hand-washing stations shall include liquid or foam soap dispensers.

2.4-2.2.8.7 Mirror. A mirror shall be provided at each resident hand-washing station.

- (1) Mirror placement shall allow for use by both wheelchair occupants and ambulatory persons.
- (2) Top and bottom edges of mirrors shall be at levels usable by individuals either sitting or standing.
- (3) A separate full-length mirror shall be permitted to serve as the required mirror.

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A2.4-2.2.8.4 (2) Hand-washing station countertops

- a. The presence of water around hand-washing sinks has consistently proven to encourage the presence of molds and bacteria in the substrate materials if the countertops are not properly sealed and maintained.
- b. Integral backsplashes eliminate intersections that need to be caulked.
- c. Use of marine-grade plywood substrate for plastic laminate countertops should be considered.
- d. Under-mount basins are difficult to clean, and their use is discouraged.

2.4-2.2.9 Grab Bars

*2.4-2.2.9.1 Grab bars shall comply with all local, state, and federal requirements.

*2.4-2.2.9.2 Grab bars shall be installed in all resident toilet rooms, showers, and bathing facilities.

*(1) Space for transfers. If residents will require a physical lift by two staff members, toilets used by residents shall have a minimum of 2 feet 6 inches

(76.2 centimeters) from the centerline of the toilet bowl to the wall.

(2) Alternative grab bar configurations

*(a) When residents can undertake independent transfers, alternative grab bar configurations shall be permitted.

*(b) Evaluation of the care population shall be considered in determining alternative grab bar configurations that meet specific resident needs.

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A2.4-2.2.9.1 ADAAG, UFAS, and ANSI accessibility standards were all developed with the intention of providing greater access for individuals with disabilities. However, their standards are based on assumed stature and strength, and thus their dimensional and grab bar requirements are intended to facilitate wheelchair-to-toilet transfers by individuals with sufficient upper body strength and mobility to accomplish such a transfer. The typical residential health, care, or support facility resident is unlikely to have such capabilities and thus will require the assistance of one or more staff members. Insufficient clearance at the side of the toilet can restrict staff mobility and access and result in injury.

A2.4-2.2.9.2 Grab bars in bathrooms

a. Grab bars in bathrooms and bathing cores should allow residents to be as safe and independent as possible. This includes using drop-down grab bars when needed, with or without integral toilet paper holder. See appendix section A2.4-2.2.9.2 (2)(a) (Alternative grab bar configurations) for additional information.

b. When bathroom entrances in resident units are located on the same wall as the resident bed headwall, fewer steps are needed for the resident to reach the bathroom from bed. If this arrangement is provided, continuous handrails should be installed to assist with mobility and safety.

A2.4-2.2.9.2 (1) Grab bars in bathrooms should allow staff to complete a two-person transfer for a single resident. This includes evaluation of the toilet in relation to the wall and the grab bars provided. Clearance is required on both sides of the toilet for a double transfer to occur.

A2.4-2.2.9.2 (2)(a) Alternative grab bar configurations should address the following scenarios:

a. When a resident is capable of independent transfer facilitated by the grab bar and side-wall location required by accessibility standards, a removable/temporary wall structure and grab bar can be installed alongside the toilet.

b. When a resident requires partial assistance in transfer, provision of fold-down grab bars on one or both sides of the toilet would

facilitate such transfers. Installation of fold-down grab bars requires evaluation of the toilet in relation to the wall and the grab bars provided. Clearance is needed on both sides of the toilet for an assisted transfer involving two or more staff members. The location of the toilet should be reviewed with regulators.

c. Spacing of grab bars and appropriate lengths and heights for grab bars should be ergonomically evaluated in conjunction with the following:

- Toilet heights
- Sink locations
- Types of bathing fixtures
- Specific types of lifting equipment and toileting/bathing slings used by the care provider

d. Provision of a maximum clearance of 14 inches (35.56 centimeters) from a grab bar to the center line of the toilet bowl should be considered to allow residents to safely reach the grab bar. Specifically, this applies to residents independently raising and lowering themselves from the toilet with the assistance of the grab bar configuration.

e. The length of a grab bar should extend 4 inches (10.16 centimeters) from the front of the toilet bowl to allow for proper ergonomic use by residents raising and lowering themselves from the toilet with the assistance of the grab bar configuration.

f. Where bariatric design is required, the length of rear wall grab bars should be 44 inches (112 centimeters) and mounted per the *ADA Standards for Accessible Design*.

f. Creation of mock-ups should be considered when evaluating alternative grab bar configurations. In some cases, grab bar redundancy may be appropriate. See Section 1.2-3.1 (Resident Handling and Movement Assessment) for criteria to be evaluated in a mock-up.

g. Grab bars may be vertical or horizontal based on the model of care and the needs of the care population.

A2.4-2.2.9.2 (2)(b) Based on the care population, temporary alternative grab bar configurations may be permitted to allow for transfers for residents who have changing abilities, are in rehabilitation, or are increasingly frail. Grab bar configurations that offer flexible solutions should be considered. Installation of temporary or flexible

***2.4-2.2.9.3** For wall-mounted grab bars, a minimum clearance of 1.5 inches (3.81 centimeters) from walls shall be provided.

2.4-2.2.9.4 Concentrated load requirements

- (1) Grab bars, including those which are part of fixtures such as soap dishes and toilet paper holders, shall be anchored to sustain a minimum concentrated load of 250 pounds (113.4 kilograms).
- (2) Grab bars installed in areas intended for use by bariatric residents shall be anchored to sustain a minimum concentrated load of 800 pounds (362.88 kilograms).

2.4-2.2.9.5 Grab bars shall have a finish value that contrasts with the adjacent wall surface.

2.4-2.2.9.6 Grab bars shall be returned to the wall or floor with eased corners if a mitered corner condition exists.

2.4-2.2.10 Handrails

2.4-2.2.10.1 Handrails shall comply with the 2010 *ADA Standards for Accessible Design*. Use of alternative handrail cross-sections and configurations that support senior mobility shall be permitted.

2.4-2.2.10.2 All stairways and ramps shall have handrails.

2.4-2.2.10.3 Where corridors are defined by walls, handrails or lean rails shall be provided on both sides of all corridors used by residents, participants, and outpatients.

2.4-2.2.10.4 A handrail shall be provided for each clear corridor wall length exceeding 12 inches (30.48 centimeters).

2.4-2.2.10.5 A minimum clearance of 1.5 inches (3.81 centimeters) shall be provided between the handrail and the wall.

2.4-2.2.10.6 Handrails or lean rails shall return to the wall or floor.

2.4-2.2.10.7 Handrails, lean rails, and fasteners shall have a smooth surface that is free of rough edges.

2.4-2.2.10.8 Handrails or lean rails shall have eased edges or corners.

***2.4-2.2.11 Protection from Heated Surfaces**

2.4-2.2.11.1 Emergency shutoffs shall be provided in resident areas where heated surfaces are used.

2.4-2.2.11.2 These locations shall be identified on construction documents.

2.4-2.2.12 Signage and Wayfinding

2.4-2.2.12.1 See Section 1.2-4.5.3 (Signage and Wayfinding) for functional programming requirements.

2.4-2.2.12.2 Signage shall be consistent with all local, state, and federal regulations.

***2.4-2.2.12.3** Strategically placed interior and exterior signage as well as visual environment and surface-applied cues shall be provided for resident and visitor orientation.

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configurations should be tested for safety and security before residents use them.

A2.4-2.2.9.3 Consideration should be given to increasing clearances for residents with arthritis and similar physical conditions.

A2.4-2.2.11 Heated surfaces. Heated surfaces referenced in this section are intended to include those surfaces to which residents have normal access that exceed 110°F (43°C). In household care models,

stoves or other cooking elements are often used as part of a “home-style” country kitchen or an activity area. This requirement does not extend to medical or therapeutic equipment.

A2.4-2.2.12.3 Signage and wayfinding. Clearly visible and understandable signage, icons, universal symbols, landmarks, and/or cues for orientation (including views to the outside) should be coordinated and provided.

- a. A destination hierarchy should be developed to ensure the right

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- information is presented at the right time. The destination hierarchy should manage the number of symbols by building, zone, or floor. Users have difficulty differentiating more than 16 unique symbols in one set.
- b. Boundaries between public and private areas should be well-marked or implied and clearly distinguished.
 - c. A wayfinding system should be designed for consistency in the overall wayfinding plan. This should include:
 - Directional and orientation signs (overhead, wall-mounted, maps, etc.)
 - Destination signs
 - Room identification signs
 - Regulatory signs, including provisions for residential health, care and support facility-specific policy and information signs
 - Interior “landmarks” to aid occupants in cognitive understanding of destinations
 - To be effective, landmarks should be unique. Landmarks may include water features, major artworks, distinctive colors, or decorative treatments at major decision points in the building.
 - Design of landmarks should attempt to involve tactile, auditory, and language cues as well as visual recognition.
 - Landmarks should only be used at decision points.
 - d. Each sign should be accurate, legible, and functional.
 - Nomenclature should be consistent and understandable to the general public. Signs should be written at a sixth grade level.
 - Letters should contrast with the background to conform to ADA requirements.
 - Signs in areas with housing and services primarily for older adult residents should have letters that contrast with the background by a minimum of 70 percent.
 - Greatest readability is usually achieved through the use of light-colored characters or symbols on a dark background.
 - Signs should have an eggshell finish (11 to 19 degree gloss on 60 degree glossimeter).
 - When used, symbols and pictographs should be recognizable to the general public and the community served. (The Universal Symbols in Healthcare have been tested for usability and comprehension.)
 - The number of symbols used on a single sign should be limited and should indicate primary destinations only.
 - When combining health care symbols with other universal symbols used in transportation or accessibility, the different sets of symbols should be clearly differentiated.
 - e. Signage systems should be flexible, expandable, adaptable, and easy to maintain.
 - Fabrication should allow messages to be changed.
 - Signage should be consistent with other resident and family communications, supporting printed collaterals, Web and electronic media, and branding of a facility or community.
 - f. “You Are Here” (YAH) map recommendations
 - YAH maps should be oriented so that forward is up.
 - It is preferable to use a perspective view. Where vertical navigation is required, consider illustrating the relationship between levels and which elevator cores serve which areas, especially when floors are not contiguous.
 - Inset maps should be used to locate details in the overall map when appropriate.
 - g. Exterior signage (general)
 - Directional signs should be easily visible from the street and located and sized so that drivers can easily read them when traveling at the local speed limit.
 - Consistency should be used in the nomenclature of buildings.
 - Directions should be clear to all users.
 - Signage should be placed within an individual’s 60-degree “cone of vision,” whether the person is walking or driving.
 - Exterior directional signs should be visible at night.
 - Signage should be located where it may easily be seen.
 - h. Exterior signage (parking)
 - Directions should be provided to the various parking locations, where applicable.
 - Directions should be provided from the parking structure to the entrance of the facility.
 - Signage should clearly indicate short-term and long-term parking rates if applicable.
 - If valet parking is provided, its location should be clearly marked.
 - Directional signage should be provided for automobile and pedestrian traffic at an appropriate scale for each.
 - Floor numbers or sections should be clearly marked.
 - i. Interior signage (entrance and exit)
 - A well-designed and located set of interior signs and clearly labeled directional maps should be located near the entrance. Symbols used on directional signage should also be used in orientation maps for consistency and to help users find primary destinations.
 - Signage should clearly identify all publicly accessible functional and community spaces in the facility (cafeteria/dining, gift shop, restrooms, etc.).
 - When symbols are used, a single symbol should be used to represent a single primary destination.
 - Adequate signage should be provided to direct people out of the facility and back to parking and public transportation.
 - j. Interior wayfinding (room numbering)
 - Room numbering should be of a consistent nature from floor to floor and area to area.
 - The numbering system should be simple and continuous.
 - Design of the numbering system should be flexible to allow for future expansion and renovation.
 - Room numbering should take into account the need for sequential strategies for public wayfinding that may be different from operational and maintenance numbering.

2.4-2.2.13 Decorative Water Features*2.4-2.3 Surfaces****2.4-2.3.1 General**

Light reflectance values (LRV) of all surfaces shall comply with ANSI/IES RP-28: *Recommended Practices*

for Lighting and the Visual Environment for Senior Living.

***2.4-2.3.2 Flooring and Wall Bases**

***2.4-2.3.2.1** Flooring surfaces shall meet the needs of residents, participants, or outpatients and be cleanable and wear-resistant for the location.

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—Signs should differentiate between those spaces used by residents/visitors and those used by staff.

k. Interior wayfinding (sign placement)

—Signs providing directions should be placed at major decision points, including major intersections, major destinations, and changes in buildings and/or specific care areas.

—If there are no major decision points, reassurance signs should be placed approximately every 250 feet (76 meters).

l. Wayfinding to serve residents with dementia

—Major characteristics of persons with Alzheimer's and other dementia are lack of attention span and an inability to orient themselves in the physical environment. To address this, the physical environment should provide discernible landmarks and wayfinding cues and information to aid in navigation from point to point. Sensory cuing used in other health, care, and support resident areas should also be used in areas for persons with dementia.

—Consideration should be given to provision of the following wayfinding elements in dementia and mental and cognitive health units:

- Landmarks: Design elements can provide clear reference points in the environment (e.g., a large three-dimensional object, outdoor view, large picture, or other wall-mounted artifact).
- Signs: When appropriate, large characters and redundant word/picture combinations should be used on signs.

—Residents with dementia require color to be associated with a symbol to be recognizable. They will not automatically associate color alone with a specific meaning.

—Color may be used to cue out spaces. For example, mechanical doors and door frames that match the finish of the surrounding walls are less likely to draw a resident's attention to the mechanical room.

A2.4-2.2.13 Decorative water features

a. The design of indoor water features should meet the following requirements:

- Human contact with the water should be limited and/or water disinfection systems should be applied.
- Materials used to fabricate the water feature should be resistant to chemical corrosion.

—Water features should be designed and constructed to minimize water droplet production.

—Exhaust ventilation should be provided directly above the water feature.

—Surfaces that mitigate the risk of slipping should be used and maintained around a water feature.

b. Aquariums should be enclosed to prevent resident or visitor contact with the water. Aquariums are not subject to exhaust ventilation recommendations.

A2.4-2.3.2 Wall bases. Wall bases in resident areas (resident rooms, corridors, dining and activity rooms) and public bathrooms should match the color/value of the walls and provide a strong contrast to the floor to distinguish the vertical and horizontal planes.

A2.4-2.3.2.1 Flooring

- a. See appendix section A2.4-2.1.2.2 (1) (Environmental factors and falls) for information about the relationship between flooring and falls.
- b. Flooring materials should have a medium color/value; use of flooring in dark colors/values should be avoided. The base molding should match the walls in color/value.
- c. Strongly patterned flooring materials should be avoided as they can be confusing to residents with impaired vision.
- d. Moving an elevated resident around and through a space using portable lifting equipment without powered wheels may require more exertion by staff than using ceiling-mounted equipment.
 - The exertion required by staff may increase with the use of carpet; however, different types and brands of carpet may have significantly different levels of resistance to wheeled devices.
 - Installation of a mock-up is recommended to test the action of wheeled equipment and devices used in a facility over proposed flooring materials.
 - Carpet should not be automatically discounted as inappropriate due to this challenge as it has major advantages over hard-surface flooring in terms of noise reduction, other acoustic considerations, and residential appearance, all of which are important in creating a comfortable, attractive living environment for residents.

2.4 DESIGN AND CONSTRUCTION REQUIREMENTS

2.4-2.3.2.2 Flooring surfaces shall provide smooth transitions between different flooring materials.

2.4-2.3.2.3 Flooring surfaces shall allow for ease of ambulation and self-propulsion.

2.4-2.3.2.4 Flooring surfaces shall allow easy movement of all wheeled equipment used in the facility.

***2.4-2.3.2.5** Flooring surfaces, including those on stairways, shall be stable, firm, and slip-resistant.

- (1) The slip resistance ratings of flooring surfaces shall be appropriate for the area of use—for dry or wet conditions and for use on ramps and slopes.
- (2) Slip-resistant flooring products shall be used for surfaces in bathing areas and rooms, wet areas, and ramps and entries from exterior to interior spaces.
- (3) Carpet in resident areas shall be installed to prevent trip hazards or interference with resident, participant, or outpatient use of resident-operated mobility devices and assistive ambulation devices and staff use of carts and equipment.

2.4-2.3.2.6 Areas subject to frequent wet-cleaning methods

- (1) The floors and wall bases of kitchens, soiled workrooms, toilet rooms, and other areas subject to wet-cleaning methods shall be constructed of materials that are not physically affected by germicidal or other types of cleaning solutions.
- (2) Areas subject to wet cleaning shall have floors that are homogeneous and have sealed joints.
- (3) Wall bases in areas that require wet cleaning (e.g., soiled and clean utility rooms, environmental services rooms with mop sinks) shall be continuous

and covered with the floor, sealed to the wall, and constructed without voids.

2.4-2.3.2.7 Food preparation areas

- (1) Floors in areas used for food preparation and assembly shall be water-resistant.
- (2) Floor surfaces, including tile joints, shall be resistant to food acids.
- (3) Floor construction in dietary and food preparation areas shall be free of spaces that can harbor pests. All joints shall be sealed.
- (4) Slip-resistant flooring products shall be used throughout kitchens, including wet areas.

***2.4-2.3.2.8 Highly polished flooring or flooring finishes that create glare shall be avoided.**

2.4-2.3.2.9 Floor openings for pipes, ducts, or conduits as well as joints at structural elements shall be tightly sealed.

***2.4-2.3.2.10** All changes of level (i.e., stairs, steps, and ramps) shall have a strong value contrast between vertical and horizontal surfaces.

2.4-2.3.3 Walls and Wall Protection

***2.4-2.3.3.1 Wall finishes**

- (1) Wall finishes shall be washable.
- (2) Wall finishes near plumbing fixtures shall be smooth, scrubbable, and moisture-resistant.
- (3) Wall surfaces in areas routinely subjected to wet spray or splatter (e.g. kitchens, housekeeping closets) shall be water-resistant.
- (4) Wall surfaces shall have a matte finish. Use of

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A2.4-2.3.2.5 ASTM C1028: *Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method* can be used to determine the slip resistance of flooring surfaces.

A2.4-2.3.2.8 Use of non-wax flooring eliminates finish glare. Where a finish coat is required, smooth flooring surfaces should be sealed with a matte finish to reduce surface glare.

A2.4-2.3.2.10 Color contrast between walls and floors and minimization of transitions between different types of flooring may reduce fall risk.

A2.4-2.3.3.1 Color/value of wall finishes

- a. Wall finishes should consist of colors/values that contrast with the floor material to distinguish vertical and horizontal planes (an issue of balance).
- b. The color/value of wall finishes should be in the range of 60–80 percent light reflectance value (LRV) to provide acceptable contrast with the floor and maximize light distribution in the space.

A2.4-2.3.3.1 (1) Selection of wall finishes should take into consideration adjacent uses, such as cooking, dishwashing, food preparation, and toileting.

highly polished, glossy, or shiny wall finishes that create glare shall not be permitted.

- (5) In dietary and food storage areas, wall construction, finish, and trim, including joints between walls and floors, shall be free of insect- and rodent-harboring spaces.
- (6) Wall openings for pipes, ducts, and conduits as well as joints at structural elements shall be sealed.

2.4-2.3.3.2 Wall protection

- (1) Wall, door, and corner protection shall be provided in areas where movable equipment is present.
- (2) Wall protection and corner guards shall be durable and scrubbable.
- (3) Sharp, protruding edges shall be avoided.
- (4) Acoustics shall be considered when selecting wall finishes. See Section 1.2-5.2 (Acoustic Planning) and Section 1.4-2.1 (Acoustic Design) for requirements.

2.4-2.3.4 Ceilings

2.4-2.3.4.1 Ceiling surfaces shall have a matte or satin finish to diffuse light and prevent reflected glare.

***2.4-2.3.4.2** Ceiling surfaces in dietary and laundry areas, bathrooms, central bathing rooms or areas with showers, soiled utility rooms (where applicable), and housekeeping closets shall be impervious and moisture-resistant.

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A2.4-2.3.4.2 The face of ceiling tile, drywall, or other substrate, as well as the suspension system and/or exposed support system in these areas, should be moisture-resistant.

A2.4-2.4.3.1 Furniture selection

recommendations. Furniture should be selected in accordance with the needs of the care program and the findings of the resident safety risk assessment (see Section 1.2-3). See the most current edition of the ANSI/BIFMA standards that apply to a health care setting and the Center for Health Design publication *Furniture Design Features and Healthcare Outcomes*.

Furniture selected for use in residential health, care, and support facilities should have non-abrasive surfaces to minimize risk of resident injuries, such as abrasions and skin shear.

A number of studies have suggested an association between falls and the design of chairs, whether built-in or freestanding:

2.4-2.3.4.3 The color/value of ceiling surfaces shall have a light reflectance value in the range of 75–90 percent to maximize distribution of light in a space.

2.4-2.4 Furnishings

2.4-2.4.1 General

The requirements in this section shall apply to case-work, millwork, and built-ins that are fixed in a space or room as well as movable furniture and window treatments in residential health, care, and support facilities.

2.4-2.4.2 Casework, Millwork, and Built-Ins

2.4-2.4.2.1 In resident use areas, corners shall be rounded or eased.

2.4-2.4.2.2 Casework, millwork, and built-ins shall be in contrasting colors/values to the walls.

2.4-2.4.2.3 Casework hardware shall have a value contrast to the casework.

2.4-2.4.3 Furniture

***2.4-2.4.3.1** Furniture provided in residential health, care and support facilities in resident, participant, and outpatient areas and community spaces shall be designed to support resident transfer and weight-bearing requirements and ambulation to enhance user independence.

- a. Seating for residents should be available that supports a variety of postures, from upright to reclined.
- b. Bottoms of residents' feet, whether elevated or down, should always be fully supported (by a footrest or the floor) so as not to encourage toe drop or compromise blood flow to the legs.
- c. Residents should be able to choose from a variety of chairs of different seat heights, depths, and widths according to their own height, weight, leg length, and physical limitations so they can execute successful sit-to-stand movements.
 - The care population should be evaluated to determine appropriate seat heights, which range from 16 to 19 inches (41 to 48 centimeters) with arm heights 7 to 8 inches (18 to 20 centimeters) above compressed seat height at the elbow.
 - Arm fronts should extend all the way to or past the front of the seat at a height appropriate to help residents safely sit down and push off to a standing position

2.4 DESIGN AND CONSTRUCTION REQUIREMENTS

2.4-2.4.3.2 Furniture selected shall have rounded and eased edges.

2.4-2.4.3.3 Furniture selected shall be upholstered with impervious materials in locations where infection control and incontinence are a concern.

2.4-2.4.4 Window Treatments and Privacy Curtains

2.4-2.4.4.1 Privacy curtains and window treatments shall comply with NFPA 101.

2.4-2.4.4.2 Window treatments shall be provided in resident areas to diffuse the daylight and control glare.

2.4-2.4.4.3 Window treatments provided in resident accommodations shall be designed for operation by the resident.

2.4-2.4.4.4 Operational requirements and the type of care provided shall dictate the need for privacy curtains.

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- Seats should be firm, with seat depth and configuration that allow residents, participants, and outpatients to exit seating comfortably and safely without assistance.
- The angle of the seat and seat back should not hinder rising nor cause shoulder-forward or hip-forward slumping or sliding out of the seat.
- d. Space beneath a seat front should allow a user to pull back his or her heels far enough under the seat to assist with rising.
- e. Furniture should have eased or rounded edges and corners of no less than 3/8 inch radius to minimize risk of resident patient injuries.
- f. Furniture used in resident areas should be sturdy and stable to safely support resident transfer and weight-bearing requirements.
- g. Rolling furniture or equipment in resident areas should have locking rollers/casters for safety. However, seating that has casters on only two legs to allow for movement on carpeted flooring surfaces should not have locking casters.
- h. Chairs that provide opportunities to rock without compromising the ability to exit safely (e.g., with stable arm fronts) should be considered for their relaxation and exercise benefits.