ISO 21542:2021 (E)

Building construction — Accessibility and usability of the built environment

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 General design considerations

4.1 General
4.2 Key accessibility issues

5 Orientation and information outside and inside of a building

5.1 Orientation and information
5.1.1 General
5.1.2 Levels of information
5.1.3 Principle of multiple senses
5.1.4 Tactile walking surface indicators – TWSI
5.2 Floor and wall surfaces
5.3 Visual contrast
5.3.1 General
5.3.2 Luminance contrast
5.3.3 Luminance contrast of glossy or shiny materials
5.3.4 Choice of colours and patterns
5.3.5 Relevant design factors
5.4 Lighting
5.4.1 General
5.4.2 External lighting
5.4.3 Lighting inside buildings
5.4.4 Lighting to facilitate wayfinding
5.4.5 Controllable and adjustable lighting
5.4.6 Light levels in different areas
5.4.7 Glare and shadows
5.5 Signage
5.5.1 General
5.5.2 Types of signs
5.5.3 Placement of signs
5.5.3.1 Outside of buildings
5.5.3.2 Inside of buildings
5.5.4 Height and location of signs
5.5.5 Font and size of lettering
5.5.6 Luminance contrast
5.5.7 Glare and illumination
5.5.8 Understandability
5.5.9 Provision of raised tactile and Braille signs
5.5.10 Tactile characters, figures, signs and graphical symbols
5.5.11 Braille
5.5.12 Tactile symbols
5.5.13 Tactile maps and floor plans
5.5.14 Information displays
5.6 Graphical symbols
5.7 Acoustics
5.7.1 General

5.7.2 Control of noise
5.7.2.1 General
5.7.2.2 Sound absorption
5.7.2.3 Sound amplification
5.7.2.4 Acoustic environment
5.7.3 Hearing enhancement
5.7.3.1 General
5.7.3.2 Induction loop system application
5.7.3.3 Receivers
5.8 Emergency warning systems, signals and information
5.8.1 General
5.8.2 Emergency warnings
5.8.3 Audible emergency warnings
5.8.4 Visual emergency warning signals
5.8.5 Fire emergency warning systems
5.8.5.1 General
5.8.5.2 Audible fire emergency warning signals

6 Approaching and entering a building or the built environment

6.1 General
6.2 Parking
6.2.1 Location of accessible parking spaces
6.2.2 Number of designated accessible parking spaces
6.2.3 Dimensional requirements for car parking spaces
6.2.4 Dimensional requirements for parking spaces for wheelchair accessible vans
6.2.5 Signage
6.2.6 Surface characteristics of accessible parking spaces
6.2.7 Kerb ramp from parking space to an adjacent higher pedestrian path
6.2.8 Accessible indoor parking spaces
6.2.8.1 General
6.2.8.2 Signage
6.2.8.3 Location of designated accessible parking spaces
6.2.8.4 Height of clearance
6.2.9 Parking control
6.2.10 Storage spaces for powered wheelchairs, scooters and other mobility aids
6.2.11 Storage facilities for buggies and cycles
6.2.12 Drop-off areas
6.3 Paths to the building
6.3.1 General
6.3.2 Wayfinding, guided path and other physical information
6.3.3 Width of the path and passing and turning spaces for persons using a wheelchair
6.3.4 Stepped path and stairs
6.3.5 Landings of sloped paths
6.3.6 Handrail support and guidance on paths
6.3.7 Drainage of access and egress routes
6.3.8 Obstacles in a path
6.4 Ramps
6.4.1 General
6.4.2 Slope and length
6.4.3 Width of ramps
6.4.4 Landings of ramps
6.4.5 Handrail support and guidance by handrails on ramps
6.4.6 Drainage of ramps
6.4.7 Surface materials
6.5 Protection along paths and ramps
6.6 Building entrances and final fire exits
6.6.1 General
6.6.2 Thresholds at entrances and final fire exits
6.6.3 Circulation space at entrance doors and final fire exits
6.6.4 Space requirements between doors in series and in vestibules

7 Horizontal circulation in a building

7.1 Internal circulation routes and manoeuvring spaces
7.1.1 General

7.1.2 Internal circulation routes/corridors
7.1.3 Turning space for 90° turn of a wheelchair in corridors
7.1.4 Turning space for 180° wheelchair turn
7.2 Moving walks

8 Vertical circulation in a building

8.1 General
8.2 Ramps in buildings
8.3 Stairs
8.3.1 General
8.3.2 Rise and going of steps
8.3.3 Minimum width of stair flights
8.3.4 Staircase landings
8.3.5 Head clearance
8.3.6 Visual and tactile warnings
8.3.7 Handrails and guards along stairs
8.4 Handrails
8.4.1 General
8.4.2 Characteristics of a handrail
8.4.3 Continuity of a handrail
8.4.4 Height of a handrail
8.4.5 Horizontal extension of a handrail
8.4.6 Visual and tactile information
8.4.7 Mechanical resistance
8.5 Lifts
8.5.1 General
8.5.2 Approach and access to the lift
8.5.3 Lift car entrance — Door opening
8.5.4 Entrance width and inner dimensions of cars
8.5.5 Equipment in the car
8.5.5.1 Handrail
8.5.5.2 Seat
8.5.5.3 Floor and wall surfaces of the car
8.5.5.4 Mirror or mirrored wall within the car
8.5.5.5 Lighting
8.5.5.6 Emergency communication
8.5.6 Stopping/Levelling accuracy
8.5.7 Control devices and signals
8.5.7.1 General
8.5.7.2 Landing controls
8.5.7.3 Car controls
8.5.8 Lifts used for evacuation
8.6 Vertical and inclined lifting platforms
8.7 Escalators and moving walks

9 Components of a building and building equipment

9.1 Doorsets and windows
9.1.1 Doors and door furniture
9.1.1.1 General
9.1.1.2 Position of a doorway
9.1.1.3 Opening force
9.1.1.4 Glazed doorsets, walls and areas
9.1.1.5 Viewing panels in door leaves
9.1.1.6 Visual contrast of doorsets and door furniture with walls
9.1.1.7 Automatic opening doors
9.1.1.8 Powered swing door
9.1.1.9 Revolving door
9.1.1.10 Door furniture and controls
9.1.1.10.1 General
9.1.1.10.2 Door handles
9.1.1.10.3 Positioning of door opening controls
9.1.2 Fire-resisting doorsets
9.1.2.1 General
9.1.2.2 Opening force of fire-resisting doorsets

9.1.3 Windows and window furniture
9.1.3.1 Restriction on opening
9.1.3.2 Usability of window furniture and shutters
9.1.3.3 Lower edge of the glazing of the window
9.1.3.4 Visual indication of glazed areas
9.2 Equipment, controls and switches
9.2.1 General
9.2.2 Location, heights and distances
9.2.3 Operation
9.2.4 Identification
9.2.5 Usability and consistency in design
9.2.6 Intercoms and telephones
9.2.7 Card and vending machines
9.2.8 Security access systems
9.2.9 Drinking fountains
9.2.10 Waste disposals and containers
9.3 Furnishing
9.3.1 General
9.3.2 Seating in waiting areas
9.3.3 Seating at desks or tables

10 Rooms and spaces within non-domestic buildings

10.1 Reception areas, counters, desks and ticket offices
10.1.1 General
10.1.2 Space to manoeuvre
10.1.3 Height
10.1.4 Lighting
10.1.5 Hearing and lipreading
10.1.6 Ticket systems
10.2 Cloakroom
10.3 Conference rooms and meeting rooms
10.4 Auditoriums, concert halls, sports arenas, viewing spaces in assembly areas and similar
10.4.1 General
10.4.2 Hearing enhancement systems
10.4.3 Lighting for sign language interpretation
10.4.4 Designated seating spaces for persons using a wheelchair
10.4.5 Lines of sight over seated and standing spectators
10.4.6 Row and seat numbers
10.4.7 Access to stage and backstage
10.5 Toilet rooms, sanitary rooms and bathrooms
10.5.1 General
10.5.2 WC compartments for ambulant persons with disabilities
10.5.3 Dimensions for wheelchair accessible toilet rooms
10.5.3.1 General
10.5.3.2 Type A toilet room with lateral transfer from both sides
10.5.3.3 Type B corner toilet room
10.5.3.4 Type C toilet room
10.5.4 Toilet room doors
10.5.5 Toilet seat
10.5.6 Grab rails
10.5.7 Toilet paper dispensers
10.5.8 Washbasin
10.5.9 Water supply
10.5.10 Taps
10.5.11 Urinals
10.5.12 Other fittings
10.5.13 Assistance alarm
10.5.14 Fire emergency warning devices
10.5.15 Showers
10.5.15.1 General
10.5.15.2 Shower seat
10.5.15.3 Individual shower rooms
10.5.16 Bathrooms

10.6 Accessible bedrooms
10.7 Accessible changing rooms
10.8 Kitchen areas
10.9 Storage areas
10.10 Terraces, verandas and balconies
10.11 Bars, pubs and restaurants
10.12 Facilities for guide and other assistance dogs
10.12.1 General
10.12.2 Relief facilities for guide and assistance dogs

11 Fire safety and evacuation

11.1 General
11.2 Design objectives
11.3 Principles of fire evacuation
11.4 Emergency evacuation related building infrastructure
11.4.1 Overview on essential building infrastructure
11.4.2 Emergency evacuation routes
11.4.3 Places of relative safety
11.4.4 Lift evacuation systems
11.4.5 Areas of rescue assistance adjoining fire evacuation staircases
11.4.6 Fire evacuation staircases
11.4.7 Floors of temporary refuge
11.4.8 Final fire exit doors and fire-resisting doors
11.4.9 Fire safety plans

12 Management and maintenance issues

Annex A (informative) Housing

A.1 General
A.2 Access routes to residential buildings
A.3 Building entrance
A.3.1 General
A.3.2 Post boxes
A.3.3 Doorbell systems and intercom systems
A.4 Layout of dwellings
A.4.1 General
A.4.2 Parking spaces
A.4.3 Entrance area
A.4.4 Internal corridors
A.4.5 Kitchen
A.4.6 Living room
A.4.7 Bedroom
A.4.8 Bathroom and laundry room
A.4.9 Storage rooms
A.4.10 Balconies, terraces and outdoor spaces

Annex B (informative) Tactile walking surface indicators (TWSI)

B.1 General
B.2 Functionality and application of TWSI systems
B.2.1 General
B.2.2 Environmental context
B.3 Detection of TWSI elements
B.3.1 General
B.3.2 Tactile contrast
B.3.3 Visual contrast
B.4 Implementation of TWSI patterns
B.4.1 General
B.4.2 Guiding pattern
B.4.3 Attention pattern
B.4.4 Complementary information

Annex C (informative) Circulation spaces at doorways

C.1 General
C.2 Swinging doors

C.3 Sliding doors

Annex D (informative) Fire prevention, protection, safety and evacuation for all

D.1 General
D.1.1 Human behaviour, abilities and perception in fire emergencies
D.1.2 Fire evacuation for all
D.2 Fire safety design
D.2.1 General
D.2.2 Project brief/plan — Client requirements
D.2.3 Fire prevention
D.3 Self-protection
D.4 Evacuation skills
D.5 Emerging fire safety related technologies
D.6 Fire evacuation practices
D.6.1 Buddy system
D.6.2 Personal emergency evacuation plan (PEEP)
D.6.3 Fire warden/marshal
D.6.4 Evacuation chairs and similar devices
D.6.5 Fire emergency management plans

Annex E (informative) Methods for the determination of the luminance contrast

E.1 General determination of the luminance contrast
E.2 Determination of the luminance contrast of matte/diffuse reflecting surfaces
E.3 Determination of the light reflectance value (CIE Y-value)

Annex F (informative) Management and maintenance issues

F.1 General
F.2 External issues
F.3 Internal issues
F.4 Maintenance issues
F.5 Communication issues
F.6 Policy issues

Annex G (informative) Human abilities and associated design considerations

G.1 General
G.2 Moving abilities
G.2.1 General
G.2.2 Walking
G.2.3 Balance
G.2.4 Handling
G.2.5 Strength and endurance
G.2.6 Lifting
G.2.7 Reaching
G.2.8 Speech
G.3 Sensory abilities
G.3.1 General
G.3.2 Sight
G.3.3 Hearing
G.3.4 Touch
G.4 Mental abilities
G.4.1 General
G.4.2 Cognition
G.4.3 Intellect
G.4.4 Interpretation
G.4.5 Learning
G.4.6 Memory
G.4.7 Design considerations that take account of mental abilities
G.5 Additional factors
G.5.1 Accommodating the developing child
G.5.2 Accommodating ageing adults
G.5.3 Diversity of stature
G.6 General design considerations regarding persons using a wheelchair
G.6.1 Application and manoeuvring space
G.6.2 Space allowance for different types of wheelchairs

G.6.3 Reach range
G.6.4 Reach of persons seated in wheelchairs — Distance from corner and other barriers
G.6.5 Space around elements to provide reachability
G.6.6 Clearance for the knees of a person using a wheelchair
G.6.7 Convenient height of worktops
G.6.8 Eye level
G.7 Indoor air quality (IAQ)
G.8 Allergy related materials

Page count: 168