Universal Design Checklist

Lighting Design

Lighting plays a crucial role in architectural design. Effective lighting is essential for highlighting key spaces like stairs and signage, which is especially important for individuals who are blind, deafblind, or have low vision. Maximizing natural light offers benefits including: time-of-day orientation, energy efficiency, enhancing colour and depth perception, and positively impacting mood. The following checklist outlines best practices for integrating accessible and effective lighting in a built environment.

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Auckland Design Manual

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Recommended lighting provision

- ☐ Provide illumination that is 25 to 50 percent higher than the minimum standard illumination levels specified for rooms and spaces (Blind Low Vision NZ).
    - Ensure a space is well lit enough to illuminate obstacles, circulation building elements like entrances, ramps and stairs, and people's faces for communication.

- ☐ Consider flexibility within lighting design to enable people to control individual lighting levels.
    - Use dimmer switches and high-lumen output lights to adjust lighting levels for diverse user needs at different times of the day.

- ☐ Include task lighting or light accentuation to augment the overall lighting system[1].
    - Have provisions for zero-watt bulbs in corridors and toilet for nighttime illumination for older adults and people with low vision to be able to navigate their way safely.

- ☐ Recommended levels of illumination for internal environments (CEUD):

Location	Recommended level of illumination (lux)
Entrances	150*/≥160**
Corridors, passages, and walkways	150/≥160
Steps, ramps, and landing	200/≥160
Lifts landings and lift cars	200/≥160
Lift control panels	100
Toilets, shower rooms, and bathrooms	200-300/≥160
Offices	300/≥320
Service counters	250/≥320
Telephones	200/≥240
Switches and controls	100
Directional signs, maps, and information displays	200/≥240 (vertical illuminance)

*CEUD requirements **CRL Minimum requirements – average maintained horizontal illuminance

Recommended lighting provision

☐ Recommended levels of illumination for external environments as measured at ground level (CEUD):

Location	Recommended level of illumination (lux)
Entrances	100
Corridors, passages, and walkways	30
Steps, ramps, and landing	100
Designated car parking spaces	30
Passenger setting-down points	30

Natural lighting

☐ Ensure daylighting in buildings is diffused and even, without causing glare or shadowing.
- Consider the use of sun-shading devices and blinds.
- Special films that reduce solar and visible radiation can be installed on existing windows and glazing.

☐ Ensure a transitioning zone between low and brightly lit spaces to minimise temporary blindness due to light sensitivity, especially around entrances[2].

☐ Ensure that Interior and exterior light levels are as close to equal as possible.
- Consider the effects of natural lighting and shadowing when deciding where to place elements such as entrance canopies and stairs.

☐ Ensure all rooms and spaces benefit from some natural light, wherever possible.

Artificial lighting[3]

☐ Use “soft” or “warm” light over “cool” or “blue” tones.

☐ Ensure that light switches are noticeable from the wall they are on, especially for dimmer switches that individuals can adjust.

Lighting styles

- ☐ Use spotlighting to supplement general illumination by highlighting specific features, for example, barriers, architectural features, features of cultural significance.
    - Consider using spotlighting as a wayfinding element.

- ☐ Use task lighting for specific work locations.
    - Ensure that task lights are positioned so that users do not create shadows on work surfaces for example, provision at adjustable light levels and angles.

- ☐ Use uplighting **carefully** to **indirectly** illuminate a space by reflecting light onto a ceiling or wall[4].
    - Avoid positioning uplighting at floor level in continuous accessible path of travel.
    - Install indirect lights above the eye level to minimize risk of glare.
    - Install light fixtures with an appropriate light output to counteract the reduced illumination that results when light reflects off a ceiling.

- ☐ Ensure motion lights activate consistently without delays or erratic behaviour, using sensors for smooth gradual lighting and dimming.

Placement of lighting

- ☐ Placement of exterior and interior lighting should be directed to avoid glare and reflection and to maintain a consistent level and pattern of light.
    - Check light fixtures from all angles at their proposed mounting height to identify glare-producing surfaces, and then make any necessary adjustments to the lighting or the surfaces.
    - Position lighting to avoid shining directly into people's eyes whether seated and/or standing, especially on stairs and escalators.

- ☐ Ensure that lighting is strategically placed to highlight and enhance the visibility of important building elements, avoiding any shadowing that might obscure their features[5].

- ☐ Ensure that lighting is not affected or decreased by other elements in the area for example, overhead fans, signboards, planting[6].

- ☐ Distribute light levels evenly at working and walking surfaces.

- ☐ Consider linear overhead arrangement of lighting, this can be achieved in two ways:
    - Placing the light fixtures in the middle of the ceiling, especially for corridors[7].
    - Placing light fixtures at the two sides of where the walls meet the ceiling[8].

Placement of lighting

- ☐ **Carefully** position up lighting at regular intervals as they can be used to create a visual rhythm that can help people find their way through spaces such as public corridors.
    - They can also be positioned to focus on specific features, such as doorways.

- ☐ Locate wall-mounted light switches 750-1200mm above floor level, align horizontally with door handles and be a consistent distance from the door edge so that they are easy to locate.
    - Consider locating light switches both in and outside of rooms[9].

Surface materials and lighting

Surface materials significantly impact how light behaves, with glossy surfaces like polished granite, marble, and stainless steel often causing glare and visual confusion. Highly reflective surfaces, such as white walls or floors, can make it harder to distinguish details. Proper material selection is key to controlling glare and creating a visually comfortable environment.

- ☐ Include methods to control glare and shadow like tinted or frosted window glass, translucent wall panel systems, low-sheen floor coating, low-pile carpeting[10] and exterior awnings and canopies.

- ☐ Avoid using high sheen cleaners on walls and/or floors as this creates glare after installation.

Site-specific lighting

Task light

- ☐ Position lights near the sides of working surfaces, such as kitchen counters, desks, and benchtops, to provide direct illumination and minimize the risk of shadows on the surface.

Parks[11]

- ☐ Ensure a consistent and layered lighting (lighting of multiple sources) is provided to increase the perception of safety and wellbeing

- ☐ Consider a “safe-lighting route” approach for a park’s path that has highest foot traffic, best connections, and most visibility.

- ☐ Place warm toned illumination close to street furniture to make it more welcoming.

- ☐ Floodlights (apart from sports fields) should be avoided (McInnes)[12].

Site-specific lighting

Elevators/Lifts

- ☐ Ensure an even level of illumination throughout to eliminate shadows and dark spots.
- ☐ Ensure buttons and control panels are backlit or have high contrast, illuminated text and numbers[13].
- ☐ Ensure a smooth lighting transition between the lift landing and lift car.
- ☐ Consider the illuminated door edge for the door's location and to provide a visual and auditory cue for when they open and close.

Escalators and Stairs

- ☐ Provide bright and uniform lighting at both the top and bottom landings of the escalator.
- ☐ Consider including subtle lighting under handrails to guide users and make the handrails and stairs more distinguishable.

Toilet

- ☐ Avoid motion sensor lighting in accessible toilets.
- ☐ Ensure lighting illuminates the entire toilet space, not just the cubicles.

Maintenance

Proper lighting maintenance is essential in universal design to ensure consistent illumination and accessibility. A single failed bulb can create disruptive shadows, while multiple outages can significantly reduce visibility, posing safety risks and limiting usability. Regular upkeep prevents these issues, supporting a safe and inclusive environment.

- ☐ Inspect lighting fixtures regularly for signs of wear, damage, or malfunction. Light sources (integral with fitting) should be replaced as soon as they have burnt out in order to maintain adequate light levels (CEUD).
- ☐ Clean light fixtures, lenses, and diffusers regularly to remove dirt, dust, and debris that can reduce light output and efficiency.
- ☐ Inspect regularly for any signs of overheating or electrical issues.
- ☐ Check and recalibrate timers, sensors, and other lighting controls to ensure they are functioning correctly.

Endnotes

1. This is an economical way to provide extra light for certain areas without having to light the entire space brightly. Task lighting benefits everyone and is essential for people who are blind, deafblind or low vision who require extra light for detailed tasks such as reading and writing.

2. People who are blind, deafblind or have low vision as well as older adults experience difficulty moving between areas where there is a great contrast in light levels. It is important to moderate light levels, especially near entrances.

3. LED lighting is the most common and recommended option due to its energy efficiency, absence of ultraviolet radiation, daylight-like illumination, and multi-directional lighting capabilities.

4. Uplighting is useful in providing lighting without strong shadows or glare. Indirect lighting is preferred as it creates soft, glare-free environments while seeming brighter than a directly lit environment. This can be achieved through tucking lighting into valances, behind decorative fascia or creating a light cove, allowing the light to wash the walls and ceiling.

5. Shadows, whether caused by natural or artificial light, can hide important features and create optical illusions. For instance, a shadow can appear to be the edge of a table or part of a building, or it might hide an obstruction from view. Important building elements include addresses, reception, toilets, stairs and entrances and emergency exits.

6. Consider the potential growth of plants when placing them near lighting.

7. This provides a visual cue for orientation by helping to define right and left sides of the corridor. This can be achieved by either direct or indirect lighting.

8. This provides a similar visual cue that defines the width of the passageway and facilitates navigation. In this case, the lighting is indirect.

9. Placing light switches outside the room facilitates communication for deaf individuals by helping them get others' attention.

10. Low-pile carpeting is carpet with a low height which is preferred by people who have mobility impairments.

11. Street lighting for accessible routes must be in conjunction with CPTED lighting guidelines for each project and not as standalone advice.

12. Floodlights create glare which can temporarily blind and disorientate users, and it also creates a sharp drop-off area beyond paths and routes and can make users feel exposed.

13. Any information on the lift should be well lit.

References

1. Blind Low Vision NZ. (2021). Clearing our way guide. Design-Needs-Blind-Low-Vision-NZ-Clearing-our-Way-Guide-Final-Revised-08-2021.docx (live.com)

2. Centre for Excellence in Universal Design. (n.d.). Building for Everyone: A Universal Design Approach. https://universaldesign.ie/uploads/publications/4-Internal-Environment-and-Services.pdf

3. CRL. (n.d.). CRL Minimum Requirements - Lighting.

4. McInnes, E. (n.d.). “Let’s get lit” [Dissertation].

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