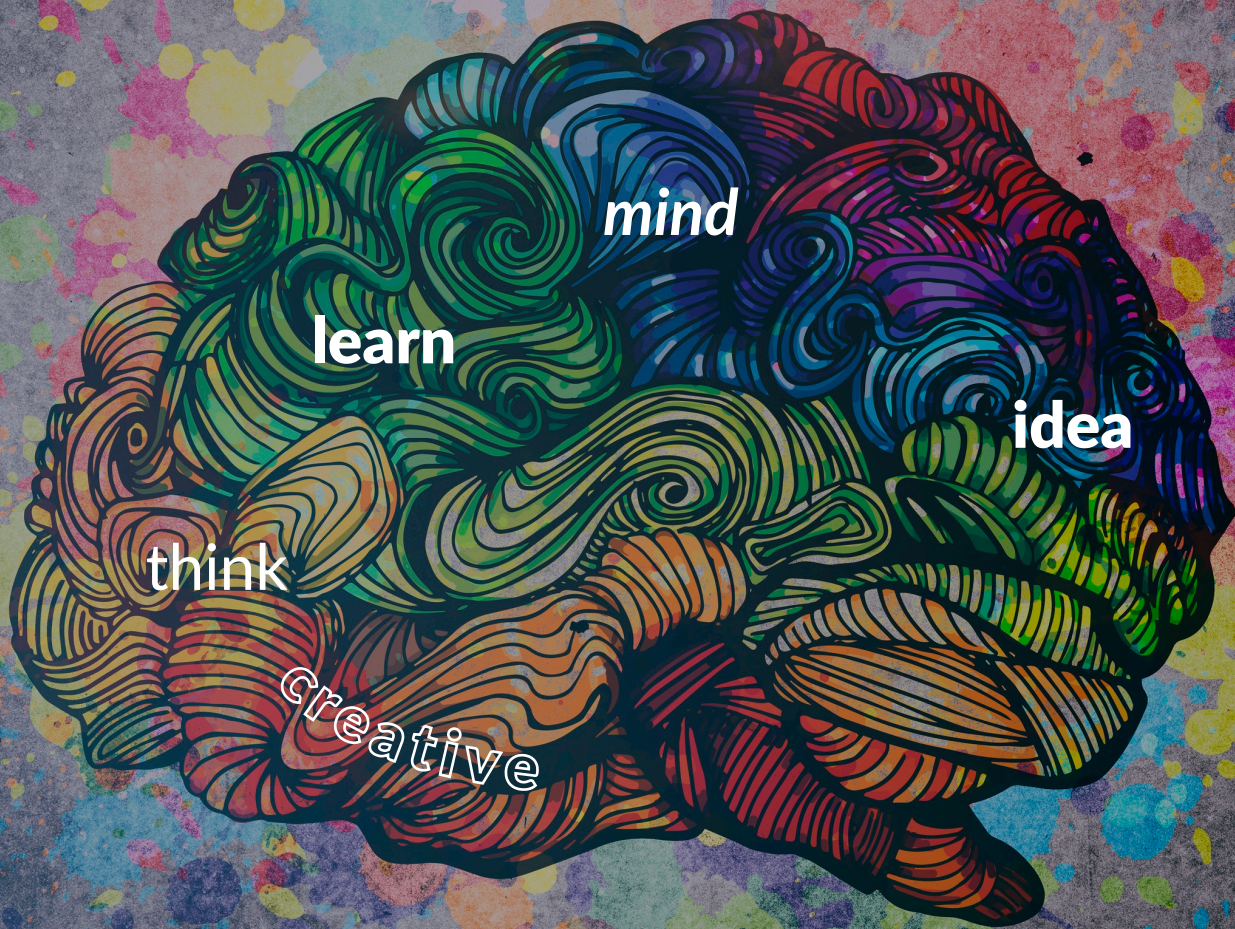


DESIGNING FOR NEURO-INCLUSIVITY

Evidence-Based Recommendations
for the Neurodiverse in Learning Environments



BSA



INTRODUCTION

What is Neurodiversity?

Neurodiversity refers to the natural variation in human brain function and behavior. It encompasses a range of conditions, including autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), dyslexia, dyspraxia, sensory processing differences, and other cognitive or developmental variations. Neurodiverse individuals experience and interact with the environment differently, often perceiving sensory, social, and spatial cues in ways that are distinct from neurotypical peers.

In higher education, neurodiverse students represent a growing and vital segment of the campus population. Their success depends on academic support and environments that respect and accommodate diverse sensory, cognitive, and emotional needs.

Research conducted by Jill Schaefer and Autumn Sanchez indicates that approximately 10 to 30 percent of students in higher education identify as neurodivergent. Additionally, some estimates suggest that around 15 to 20 percent of the global population may demonstrate some degree of neurodivergence (2024).⁴⁰

Purpose and Scope

This guide provides a structured, evidence-based framework for designing environments that support neurodiverse students in campus settings. While it is centered on the needs of neurodivergent students, the strategies outlined also improve the experience of ALL campus users. Environments that prioritize sensory comfort, intuitive navigation, flexible spaces, and personal autonomy enhance the well-being and performance of students, faculty, staff, and visitors alike.



Neuro-inclusive design aligns with universal design principles, reducing barriers for a wide range of individuals, including those with temporary disabilities, mental health conditions, or varying learning preferences. By promoting comfort, accessibility, and adaptability for all, these guidelines contribute to greater satisfaction, engagement, and success across the entire campus community.

Why Neuro-Inclusive Design Guidelines Are Needed

Despite increased awareness of neurodiversity, most campus environments today are still primarily designed for neurotypical experiences. Sensory overload, disorienting circulation, inflexible spaces, and inaccessible technologies



create invisible barriers that limit participation, comfort, and achievement for neurodivergent students.

Existing standards—such as the Americans with Disabilities Act (ADA)—primarily address physical accessibility but do not adequately consider sensory or cognitive access. While frameworks like Universal Design offer broader principles, there remains a lack of targeted, actionable design guidance specifically attuned to the needs of neurodiverse users.

Without intentional design strategies, campuses risk excluding a growing population of learners who bring valuable perspectives, creativity, and resilience to academic communities.

The Value of This Guide

This document translates current research into practical, actionable design insights for campus planning, architecture, and interior design. It offers guidance across key domains: spatial planning, acoustics, lighting, furnishing, technology integration, sensory zoning, and more.

This guide helps institutions create spaces where all students can thrive academically, socially, and personally by aligning environmental strategies with the lived experiences of neurodivergent individuals. It equips clients, designers, and planners to move beyond retrofitting and toward a proactive design that normalizes neurodiversity as an essential component of inclusive campus environments.

Understanding the importance of this topic is essential. Here's why:

ENHANCED ACCESS AND EQUITY

- Neurodiversity in educational design promotes equitable access to quality education for all students, taking into account their diverse learning styles and neurological differences.
- By offering flexible learning options and tailored accommodations, educators can effectively address the specific needs of neurodivergent students, including those with conditions such as autism, ADHD, or dyslexia. This approach fosters an inclusive learning environment that supports every student's unique strength and challenge.

INCREASED ENGAGEMENT AND MOTIVATION

- Research shows that when students perceive that their needs are understood and supported, their engagement and motivation in learning significantly increase.
- Implementing neuro-inclusive design principles can foster a more positive and inclusive learning environment, ensuring that all students feel valued and respected.

IMPROVED LEARNING OUTCOMES

- Understanding and accommodating the diverse learning styles of students can significantly enhance the effectiveness of educational experiences, leading to improved academic performance.
- Integrating neurodiversity into educational design is particularly beneficial for neurodivergent students, as it creates an inclusive environment that supports their success and may open better opportunities in the future.

SOCIAL AND EMOTIONAL BENEFITS

- Neuro-inclusive design plays a vital role in fostering a sense of belonging and community within the classroom environment. It creates a safe space for students to share their thoughts and ideas openly.
- By embracing neurodiversity, educators can empower students to cultivate a positive self-image while also encouraging them to recognize and value the unique strengths of their peers. This approach not only enhances individual development but also promotes a greater appreciation for diversity within the learning community.

BROADER IMPLICATIONS FOR SOCIETY

- Promoting a neuro-inclusive mindset in education is essential for building a more inclusive and equitable society that appreciates diversity and honors individual differences.
- Embracing neurodiversity within educational settings can also better equip students for future success in the workforce, where the advantages of diverse teams are increasingly acknowledged and valued.



How to Design Authentically for a Diverse World



ABOUT NEURODIVERSITY

Different Types of Neurodiversity

Neurodiversity is a broad and inclusive term that refers to a variety of neurological differences. It encompasses conditions such as autism, ADHD, dyslexia, and dyspraxia, among others. The concept of neurodiversity highlights the idea that individuals perceive and interact with the world in diverse ways. Rather than being a fixed list of specific conditions, neurodiversity represents a spectrum of differences in how people think and process information.

The image (at right) illustrates various types of neurodiverse individuals. As we proceed, we will concentrate on only a few groups and explore how to design effectively for each one, while also identifying commonalities among them.

Neurodiversity Characteristics

AUTISM is a neurodevelopmental condition that significantly affects an individual's interactions, communication, learning, and behavior. It is marked by difficulties in social communication and interaction, along with patterns of restricted and repetitive behaviors, interests, or activities. The term "spectrum" highlights the diverse range of symptoms and varying degrees of severity that individuals with autism may exhibit.

ADHD is a neurodevelopmental disorder marked by ongoing symptoms of inattention, hyperactivity, and impulsivity. These symptoms typically emerge during childhood and may continue into adulthood, impacting daily life and overall functioning. ADHD is prevalent among children and can significantly affect their ability to concentrate, manage their behavior, and regulate their emotions. Understanding and addressing these challenges is crucial for supporting individuals with this condition.



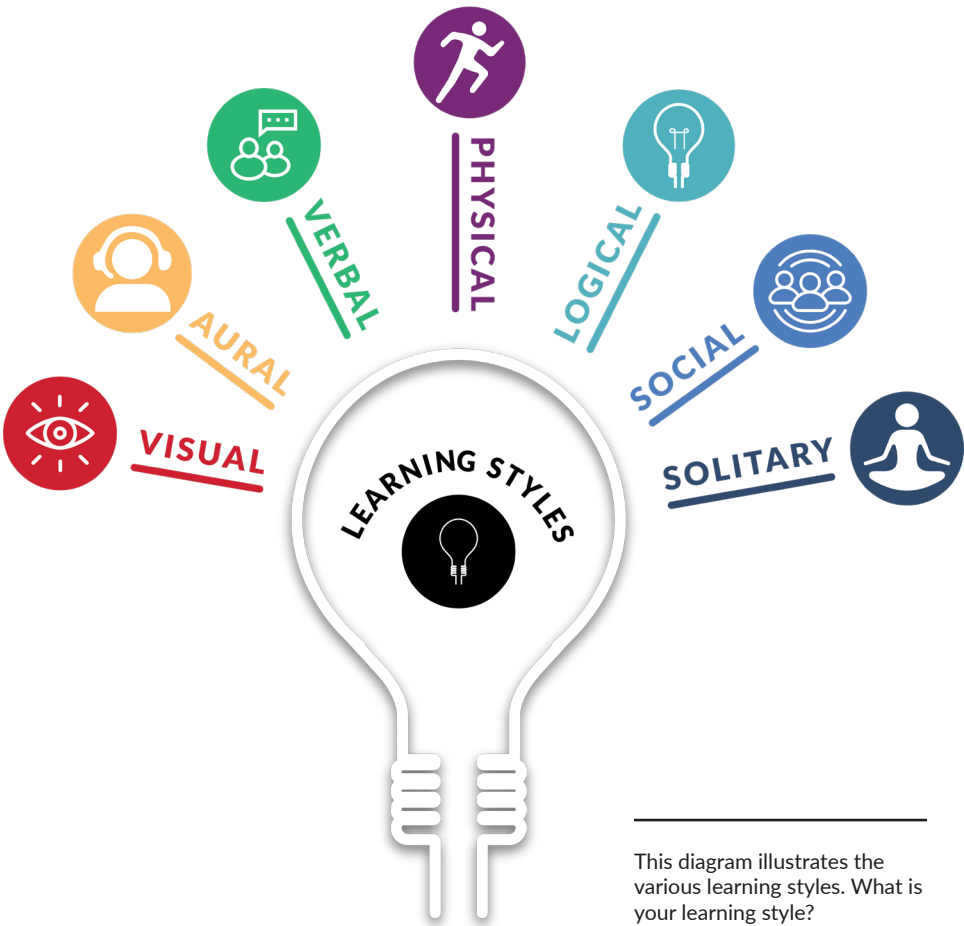
DYSLEXIA is a neurobiological learning disability that impacts an individual's capacity to read, spell, and write. Importantly, it is not linked to intelligence, nor is it related to vision or hearing issues. People with dyslexia often face challenges with accurate and fluent word recognition. This may manifest as difficulty in associating sounds with letters and blending those sounds to form coherent words.

Different Ways of Learning

Not everyone experiences neurodiversity, but it is important to recognize that everyone has a unique learning style. This diversity in learning approaches is what distinguishes us from one another. Understanding your own learning style can enhance your educational experiences and help you absorb information more effectively.

Different *learning styles* represent the diverse preferences individuals have for absorbing, processing, and retaining information. The primary styles include visual, auditory, reading/writing, and kinesthetic. Recognizing and understanding these variations can enable educators and learners to enhance educational experiences and improve information retention.

It is important to recognize the diverse array of learning styles and how we at BSA aspire to create an inclusive environment that embraces all learners, particularly those who are neurodiverse. To truly harness the power of these differences, we must deepen our understanding of neurodiversity.



This diagram illustrates the various learning styles. What is your learning style?

THE OUTCOMES



PREDICTABILITY reduces uncertainty and anxiety by providing environments where users can easily understand the spaces' layout, function, and flow. For neurodiverse students, predictable environments lessen cognitive load and facilitate independent navigation and interaction. Design supports predictability through consistent spatial organization, clear wayfinding, and minimizing unexpected environmental changes.



AUTONOMY enables students to self-direct their experience of campus spaces, giving them control over their environment and interactions. For neurodivergent individuals, autonomy minimizes reliance on others and promotes independence. Design supports autonomy by offering flexible spaces, multiple seating and activity options, and the ability for users to adjust lighting, acoustics, and other environmental factors to meet personal needs.



LEARNING is accessing, processing, and engaging with educational content in environments that support attention, comprehension, and participation. Neurodiverse students may be particularly affected by sensory distractions. Design supports learning by minimizing environmental stimuli that interferes with concentration and providing spaces that cater to varied cognitive and sensory processing needs.



ENGAGEMENT reflects how students feel empowered and encouraged to participate actively in academic, social, and community activities. For neurodivergent students, overstimulation or inaccessible spaces can hinder engagement. Design supports engagement by providing welcoming, appropriately scaled, and adaptable environments that respect individual sensory thresholds while promoting participation.



COMFORT relates to both physical and sensory ease in the environment. For neurodiverse students, comfort is essential to feeling safe, calm, and able to function optimally. Design supports comfort by controlling lighting, sound, temperature, textures, and spatial density to create environments that reduce distress and promote well-being.



REGULATION is the ability of students to manage their emotional and sensory responses to their surroundings. Neurodiverse students often need intentional design strategies to aid in self-regulation. Design supports regulation by offering access to calming environments, clear zoning of high- and low-stimulation areas, and spaces that allow users to control aspects of their environment.



SAFETY encompasses both physical protection and emotional security within campus spaces. For neurodivergent students, environments that are disorienting, overly restrictive, or over-stimulating can feel unsafe. Design supports safety by providing clear spatial cues, multiple access and egress points, and layouts that reduce feelings of entrapment or vulnerability.



FOCUS involves maintaining sustained attention and cognitive engagement with tasks or learning activities. Neurodiverse students may experience heightened sensitivity to distractions. Design supports focus by minimizing unnecessary sensory input, organizing space for clarity, and providing conditions that reduce interruptions and overstimulation.



Neurodivergent students don't need a corner; they need an environment. One where the entire room feels predictable, sensory-safe, emotionally supportive, and co-regulated.

- Alliance Against Seclusion & Restraint

NEURO-INCLUSIVE DESIGN CONSIDERATIONS

The following design considerations are meant to be recommendations and thought starters to enable early conversation in the design process.

01 SPATIAL SEQUENCING

02 COMPARTMENTALIZATION

03 SENSORY ZONING

04 ESCAPE ZONES

05 WAYFINDING

06 BIOPHILIC DESIGN

07 COLORS

08 MATERIALS

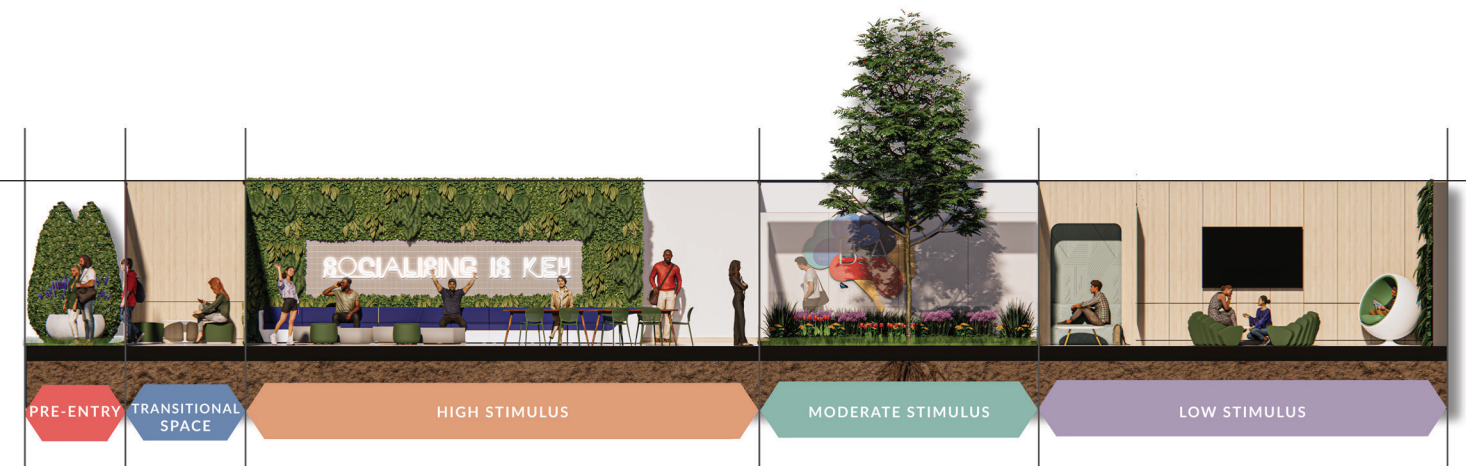
09 LIGHTING

10 FURNISHINGS

11 ACOUSTICS

12 FLEXIBILITY

13 TECHNOLOGY



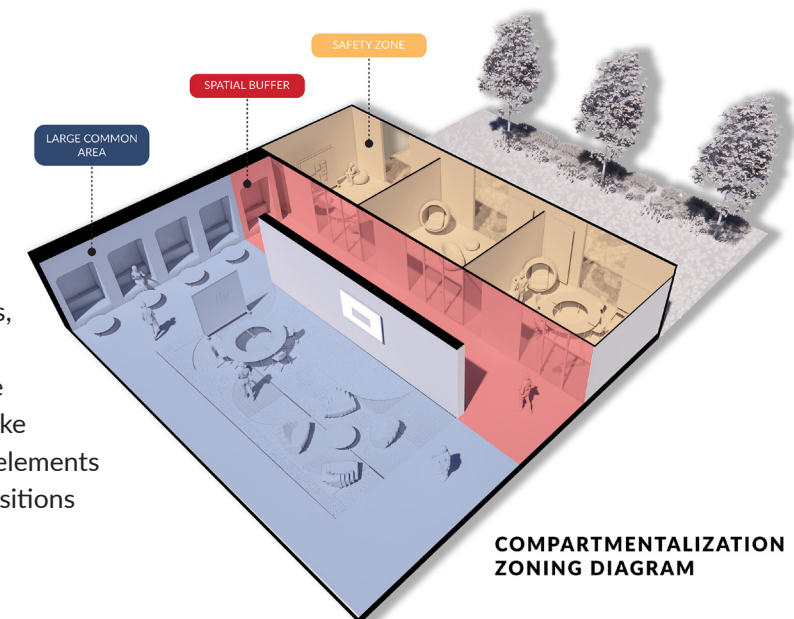
01 SPATIAL SEQUENCING

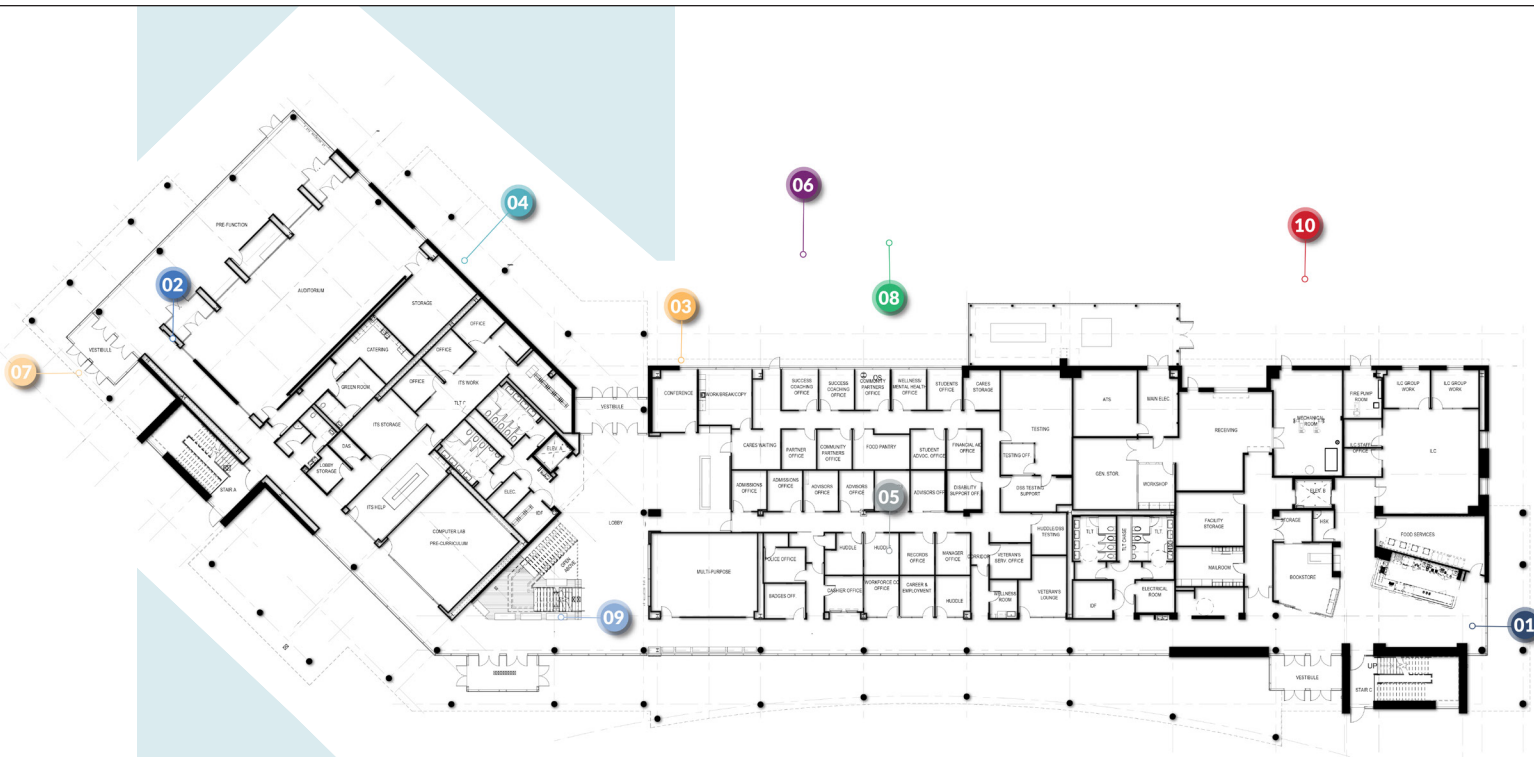
Spatial sequencing is the logical order and arrangement of spaces based on function, privacy, and transitions, with a design focus on circulation, adjacency, and functional transitions. To accomplish this goal, map user journeys early in design to organize spaces in a clear sequence—e.g., arrival → reception → learning → rest—minimizing backtracking and promoting functional flow.^{27,2} Support spatial legibility by designing intuitive, one-way routes or simple loops with few decision points, reinforced by material shifts, ceiling changes, and consistent corridor widths.^{6, 31, 26} Incorporate pause points and visual/tactile markers to signal transitions between zones of different privacy or sensory intensity.^{22,26,31}



02 COMPARTMENTALIZATION

Compartmentalization is the spatial strategy of dividing large or open-plan environments into smaller, clearly defined zones using visual, spatial, or acoustic boundaries.^{27,22} To achieve this goal, avoid undivided open floor plates by establishing clear spatial boundaries—such as partial-height walls, movable panels, ceiling changes, or acoustic fins—that define zones without full enclosure.^{6,5} Reinforce compartment identity using layered material shifts like flooring, lighting, and ceiling height, and add buffer elements such as vestibules or widened corridors to ease transitions between zones with different stimulation levels.^{5,6,22}





01
Personalized retreat with a secure pod or cozy alcove.



06
Small outdoor pavilion for small-group escape experiences.



02
Social pod/alcove designed to provide a private and quiet space for up to two individuals.



07
Outdoor Pavilion: A Sanctuary for Small-Group Escapes.



03
Individualized outdoor seating with curved designs that contour to the body, set in the calming outdoor environment.



08
Two person sensory swing hammocks.



04
Two Person outdoor seating with curved designs that contour to the body, set in the calming environment.



09
Dynamic Platform Area for Small Group Collaboration.



05
A Quiet Social Pod with Dividers.



10
Single outdoor body-contour seating with sensory movement.

03 SENSORY ZONING

Sensory zoning is the organization of environments based on levels of sensory input (sound, light, movement) that can be achieved by classifying environments into high-, moderate-, and low-stimulation zones.^{6,22,44}

- Use vestibules, alcoves, or partitions to physically separate spaces such as gyms, corridors, and quiet rooms, preventing sensory overlap and overstimulation.^{6,22}
- Reinforce the identity of each zone with layered environmental cues—such as flooring transitions, ceiling height changes, lighting variation, and color bands—to enhance legibility and predictability.^{37,27,24}
- Avoid blending stimulation levels without defined boundaries and incorporate buffer elements to ease transitions between contrasting zones.^{27,21}



04 ESCAPE ZONES

Escape spaces are small, quiet, low-stimulation areas that allow individuals to withdraw from overstimulating or socially demanding environments to self-regulate.

Embed escape spaces near high-activity zones like libraries and student centers to provide immediate access to sensory refuge.^{27,22,21} Design these rooms with soft acoustic finishes, muted color palettes, and dimmable lighting to minimize sensory input.^{2,24} Offer varied spatial options—such as cocoon seating for enclosed retreat and larger rooms for expansive regulation—to accommodate different sensory profiles.^{22,2} Ensure escape paths are direct, clearly labeled, and intuitive to minimize cognitive stress.²⁷ Where appropriate, incorporate passive supervision strategies to escape spaces—such as transparent glazing or semi-enclosed layouts—to balance privacy with safety.^{27,21}



05 WAYFINDING

Map wayfinding systems early to establish intuitive, predictable routes between key destinations, minimizing decision points and cognitive load for neurodivergent users through legible paths, multisensory cues (e.g., color-coded flooring, icon signage, auditory prompts), and enriched corridors using alcoves, textures, or artwork.^{27, 11,9,2,21,43,1,19,16} Ensure signage is accessible—repeated at choice points, high-contrast, and symbol-based—aligned with ADA standards.^{34,26,30} Entry and exit routes should be calm and direct, with at least two access points where feasible, discreet exit options, and layout validation through user testing or post-occupancy review.^{6,9,26,3}



06 BIOPHILIC DESIGN

Provide quiet outdoor areas with natural vegetation near academic buildings to support decompression and emotional regulation, using shaded garden zones with tree-lined benches, pergolas, or canopy structures to mitigate sun and heat while accommodating solitary and informal use.^{27,37,2,34,30}

Use natural materials like wood, stone, or matte-finish concrete to reduce glare, and enhance sensory richness through diverse vegetation, seasonal plantings, and multisensory features such as rustling foliage or water elements.^{27,2,30}

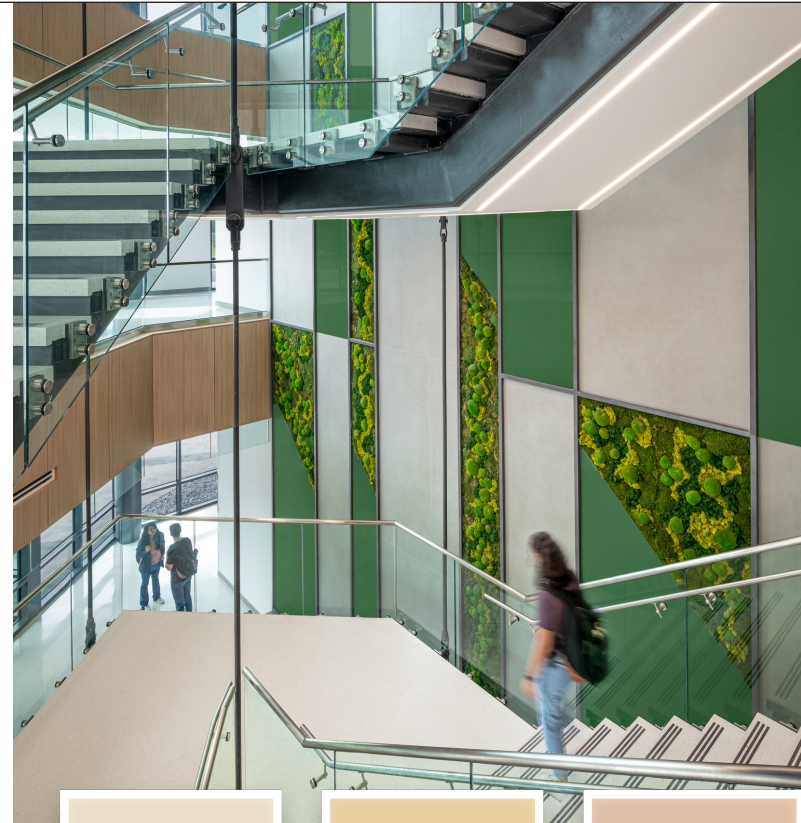


07 COLORS

Specify soft, muted, neutral, calming earth tones, soft blues, and greens or pastel color palettes to minimize visual overstimulation and support sensory comfort in neurodiverse users.^{2,22,6,27}

Avoid large expanses of saturated hues, primary colors, or high-contrast geometric patterns, which can trigger distress or sensory overload.^{21,6,29}

Incorporate subtle color zoning strategies to aid intuitive wayfinding and visually signal spatial transitions.^{2,26,44} Apply deliberate accent colors sparingly to highlight key destinations or break up visual monotony.^{22,21}



08 MATERIALS

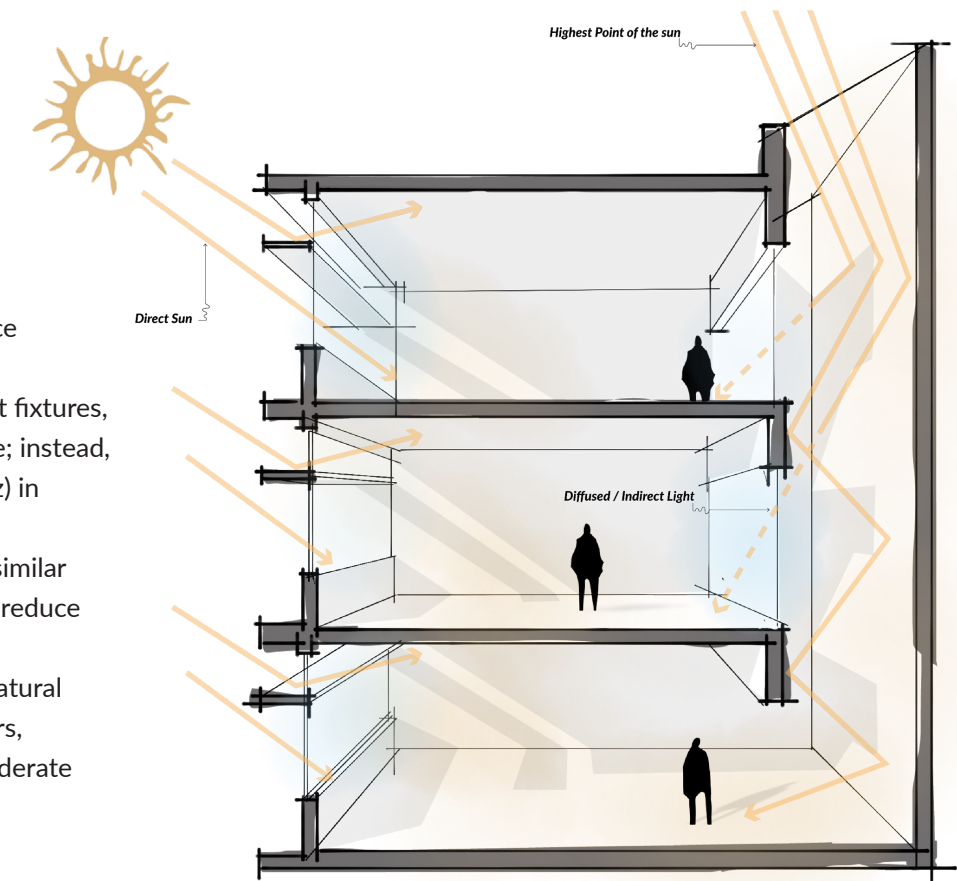
Use matte, low glare finishes for walls, floors, ceilings, and furnishings to minimize visual overstimulation and sensory fatigue.^{2,27,4,9} Avoid highly reflective materials—such as polished metals, glossy paints, and synthetic laminates—that can amplify glare and visual stress.^{6,29} Incorporate soft acoustic materials—carpeted flooring, upholstered seating, felt wall treatments, and acoustic ceiling panels—to absorb sound and reduce auditory distractions.^{6,37,28,43} Select tactile materials that include natural textures like wood, cork, and stone to provide calming, grounding sensory feedback.^{21,22,4} Avoid overstimulating surfaces with complex visual patterns or highly saturated tones in large expanses.^{27,22} Use shifts in materials to signal transitions between zones, reinforcing spatial orientation and predictability.^{21,37} Ensure material choices balance sensory comfort with durability and safety standards for long-term use.²⁸



09 LIGHTING

Implement layered lighting strategies—including ambient, task, and accent lighting—to accommodate varied user preferences and activities.^{34,21,41,1,13}

- Use warm white light (3000K–4000K) in general spaces to foster calmness and reduce the risk of overstimulation.^{25,16}
- Avoid high-intensity or flickering fluorescent fixtures, which can cause discomfort or visual fatigue; instead, specify flicker-free systems (<30% at 120Hz) in alignment with WELL standards.^{6,25,19,43}
- Maintain consistent lighting layouts across similar program areas to support predictability and reduce cognitive demand.^{26,10,30}
- Where appropriate, incorporate access to natural daylight, using diffusing elements like louvers, glare-control film, or exterior shading to moderate brightness and heat gain.^{2,27,11,5}

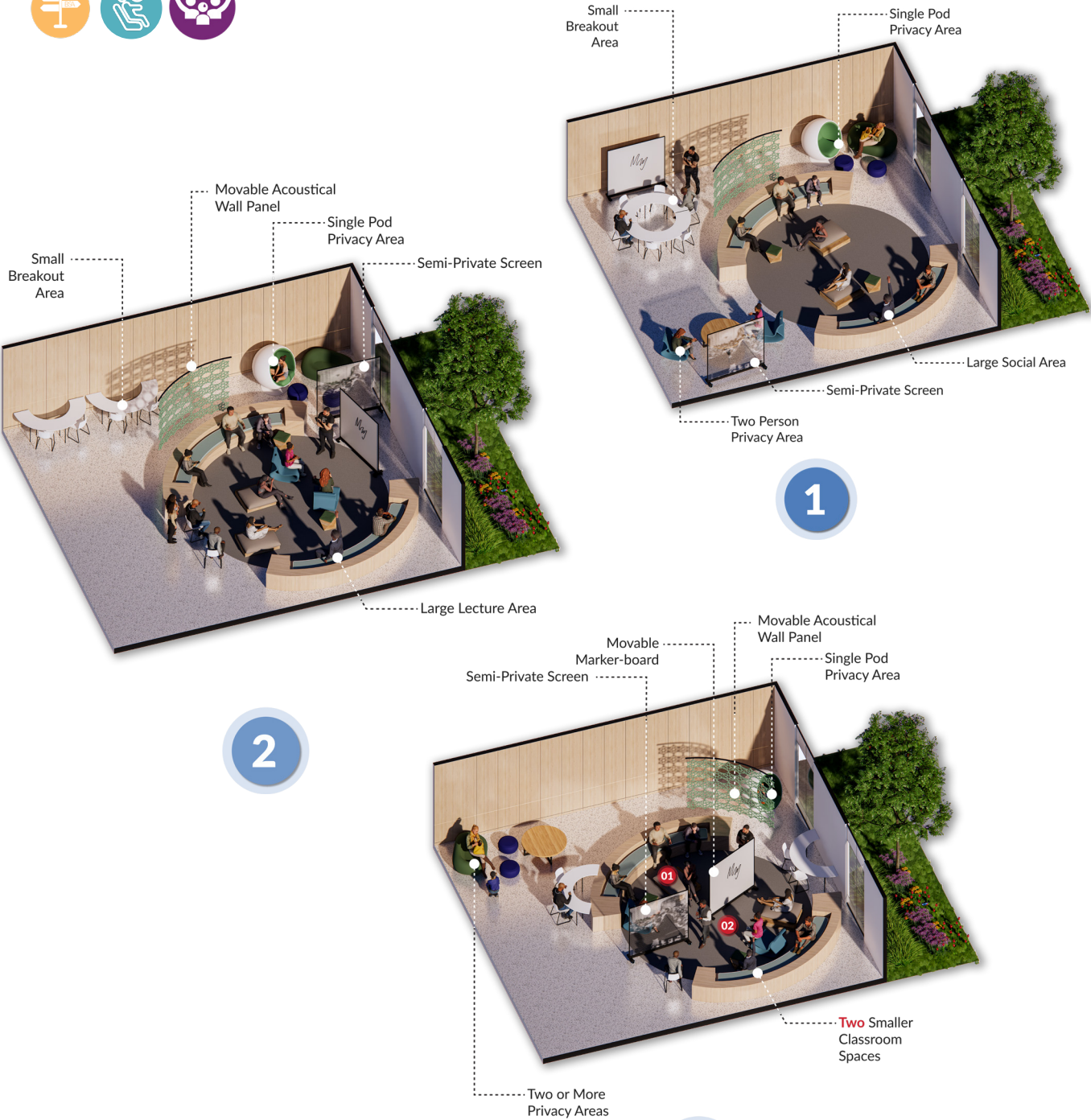


10
FURNISHINGS

Provide adjustable furniture and diverse seating options to support personalized control over room layouts, and incorporate adaptable elements such as movable cushions, footrests, and portable acoustic dividers to help users self-regulate and modify shared environments to their comfort.^{2,6,22,30,29,4,33,30}



BELOW | The diagrams illustrate three distinct layouts designed to highlight various learning environments within a single room. Each layout demonstrates how furniture can be rearranged to create spaces that cater to different types of learning experiences.



11
ACOUSTICS

Maintain ambient sound levels below 50 dB in calm zones and quiet rooms, and below 55 dB in active learning areas, to reduce sensory distress;^{6,2} Use Class A acoustic ceiling tiles and wall panels with NRC $\geq$ 0.8 in classrooms, therapy rooms, and sensory-sensitive areas to control reverberation and reduce sound reflection.^{27,19}

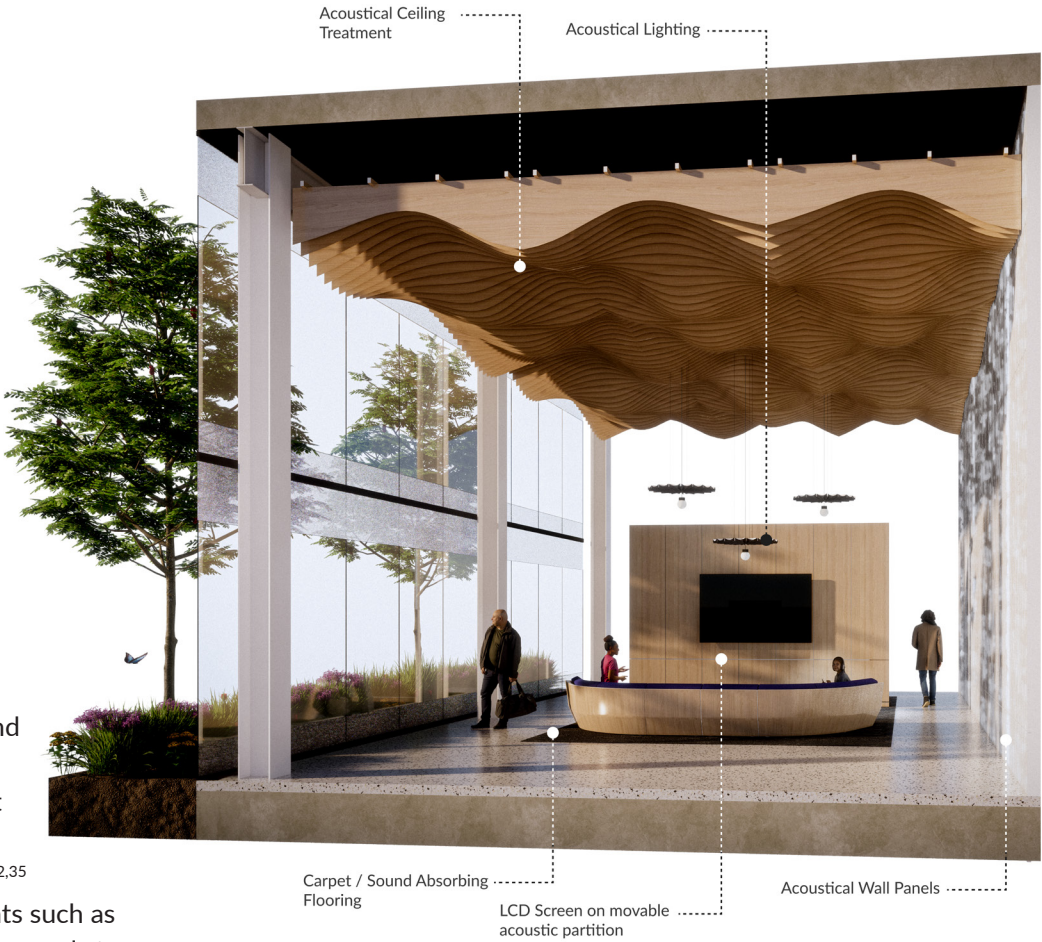
Physically separate high-noise and low-noise spaces using vestibules, acoustic partitions, or double-door entries to block sound transmission.^{22,37} Implement wall assemblies with STC $\geq$ 50 in quiet rooms or withdrawal spaces to ensure effective sound isolation.^{22,35}

Integrate flexible acoustic elements such as movable sound baffles or portable panels to adapt sound control to evolving activity needs.^{2,29} Specify low-noise HVAC systems and isolate mechanical vibrations to prevent intrusive background noise.^{34,30}

Provide personal sound control tools—like noise-canceling headphones, ear defenders, or sound-masking devices—in study and work zones for individual regulation.^{33,35}

Minimize unpredictable or jarring sound sources such as alarms, equipment buzzers, or ambient music that can contribute to overstimulation.^{37,41}

Establish predictable acoustic zoning strategies and create “micro-acoustic environments” using room layout and furnishings to signal calm versus active zones.^{27,22,24}





12 FLEXIBILITY

Create flexible micro-environments through lightweight, mobile elements such as modular walls or partitions and display boards that can be rearranged to accommodate different group sizes, pedagogies, or sensory needs.^{3,13,33,24,38,17,12,1}



- 1 Personalized retreat with a secure pod or cozy alcove.
- 2 Social Area designed to provided a private and quiet space. lightweight furniture that can be easily moved around.
- 3 Single seating area. Furniture to be curved to Contour the body.
- 4 Two or more seating area. Furniture to be curved to Contour the body.
- 5 Flexible learning area with furniture that can be moved around as needed for educational purposes.
- 6 Area that can be compartmentalized for a small group escape experience. furniture or partitions to be contoured as a feeling of safety.
- 7 Acoustical partitions that can be moved around to create a more private environment.
- 8 Whiteboards that can be moved to accommodate the students learning needs.

13 TECHNOLOGY

Provide dimmable lighting control keypads and simplified HVAC thermostats with tactile buttons and clear labels in learning and working spaces to allow sensory regulation without requiring complex inputs.^{2,27,10}

Ensure that desks and workstations include integrated technology features such as USB ports, power outlets, wireless projection hubs, and personal device docks to accommodate various learning and working styles.³⁴

Design intuitive booking and scheduling platforms—accessible via mobile or kiosk—that allow users to reserve rooms, select environmental settings, or identify sensory-compatible spaces.^{33,28}

At wayfinding points, incorporate digital signage with high-contrast fonts, iconography, and text-to-speech functionality to support navigation for users with visual or cognitive differences.^{7,28}

Implement voice-assisted technology in larger communal areas to provide on-demand wayfinding support and real-time environmental updates, such as crowd density or sensory conditions.^{45,7}

Avoid systems that require multi-step navigation or abstract interface logic, and conduct usability testing with neurodivergent stakeholders to ensure all digital tools are inclusive and intuitive.^{10,7}





PREDICTABILITY



AUTONOMY



LEARNING



ENGAGEMENT



COMFORT



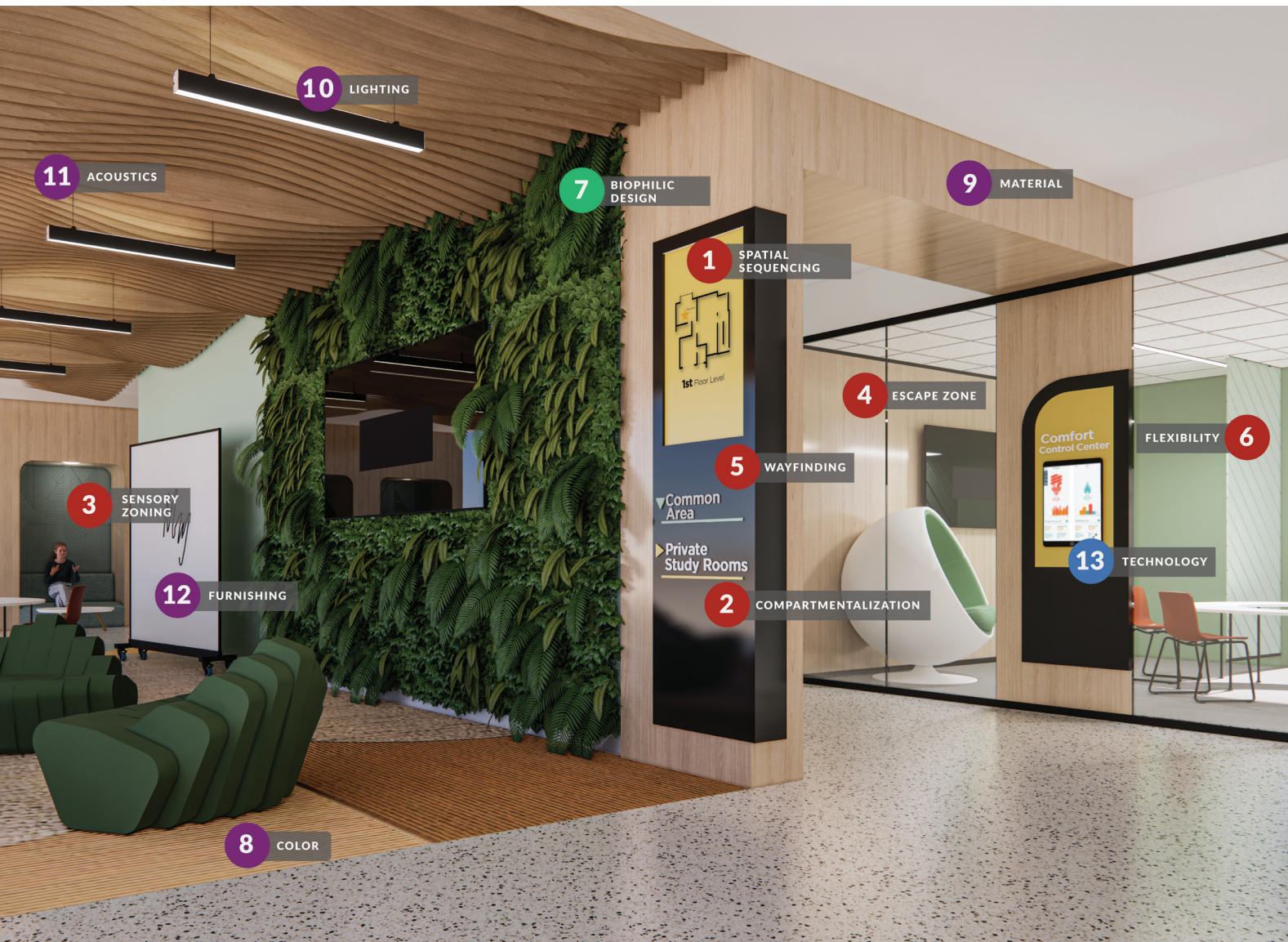
REGULATION



SAFETY



FOCUS



Numbers in image above coordinate with the previous numbered design considerations.

DESIGN RECOMMENDATION CONCEPTS

DESIGN OUTCOME

SPATIAL PLANNING

Spatial Sequencing: Map user journeys early to create a logical spatial sequence—e.g., arrival to rest areas—using intuitive routes, minimal decision points, and environmental cues like material shifts and pause zones to support functional flow and smooth transitions within circulations or functional adjacencies.^{27,2,6,31,26,22}

Compartmentalization: Divide large spaces into smaller, clearly defined zones using visual, spatial, or acoustic boundaries—such as partial-height walls, movable panels, or material changes—and incorporate buffers like vestibules to ease transitions between areas with different sensory demands.^{27,6,2,22}

Sensory zoning: Classify spaces into high-, moderate-, and low-stimulation zones, using vestibules, alcoves, or partitions to reduce sensory overlap.^{6,22,44} Reinforce zone identity and transitions with layered cues like flooring, lighting, and ceiling variation.^{27,37,21,24}

Escape zones: Locate escape zones near high-activity areas and equip them with soft finishes, dimmable lighting, and muted colors.^{27,37,21,24}

Wayfinding: Establish intuitive, low-stress circulation by mapping wayfinding early, minimizing decision points, and using multisensory cues like color-coded flooring, tactile paths, and icon-based signage.^{27,11,9,21,43,1} Ensure entries and exits are calming, clearly marked, and accessible, with at least two access points and layout validation through user testing.^{6,26,3,30}

Flexibility: Design for spatial flexibility by incorporating movable partitions, modular layouts, and reconfigurable elements.^{3,13,33,24,38,17,12,1}

NATURE INTEGRATION

Biophilic Design: Provide shaded, quiet zones with natural vegetation, diverse planting, water features, and multisensory landscape elements.^{27,37,2,30}

Color: Use soft, muted, earth tone, or pastel palettes and consistent color schemes.^{2,22,27,25,44} Avoid saturated hues, primary colors, or high-contrast patterns that may trigger distress.^{21,29}

Material: Use matte, low-glare finishes and soft, natural materials (such as felt, cork, and wood), and simple patterns.^{2,6,21,37,27,22,4,28}

INTERIORS

Lighting: Use indirect, diffuse, and flicker-free lighting ($\leq 30\%$ at 120Hz) to reduce visual overstimulation, with layered systems—ambient, task, and accent—tailored to diverse user needs.^{1,13,5,3,19,11} Provide dimmable and task lighting for personal control, use warm white light (3000K–4000K), and maintain consistent layouts across similar spaces.^{25,26,13,16,10,30}

Acoustics: Maintain sound levels below 50 dB in quiet zones and 55 dB in active areas, guided by early acoustic assessments to inform zoning and layout.^{6,2,19} Use Class A ceiling and wall panels ($NRC \geq 0.8$) in sensory-sensitive spaces and $STC \geq 50$ wall assemblies in quiet rooms to reduce reverberation and sound transmission.^{22,27,35} Separate high- and low-noise areas with vestibules or acoustic partitions, and incorporate flexible controls like portable baffles and personal sound tools.^{2,29,33,35} Specify low-noise HVAC systems, eliminate jarring noises, and apply predictable acoustic zoning using room layout and furnishings.^{34,37,41,30,24}

Furnishing: Provide mobile furnishings with adaptable elements.^{27,22,2,29,33,30}

TECHNOLOGY

Technology: Integrate intuitive, user-centered technologies that enable neurodivergent individuals to independently adjust environmental conditions, navigate spaces, and access resources, such as dimmable lighting controls, tactile HVAC interfaces, personal device docks, and simplified booking or wayfinding systems.^{27,34,10,33,7}

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