



DESIGNING FOR SPECIAL EDUCATION

BEST PRACTICES FOR SPECIAL NEEDS LEARNING FACILITIES

DESIGNING FOR SPECIAL EDUCATION



PURPOSE

ACCOMMODATING EACH CHILD





OUR APPROACH

As school designers, we at NAC Architecture are passionate about creating great spaces for all students to learn. What makes this challenging is that each student is an individual, with needs specific to their abilities, preferences, and even moods. What is a perfect environment for one student, at one time, trying to learn one thing, is certain to be an imperfect environment for another student. To accommodate the widest possible range of needs, our solution is to design for variety and flexibility.

No group of students is more diverse than special education students. These young people have an extremely wide variety of needs, and deserve to be fully accommodated. Legally, per the Individuals with Disabilities Act (IDEA) of 1990, special education students are entitled to a “free and appropriate public education” in the “least restrictive environment.” These important terms highlight our duty to accommodate each child’s specific conditions.

This book provides planning and design principles pulled from NAC Architecture’s collective experience, as well as expert special educators, and examples from around the world. It represents our goal to spread this expertise in designing facilities for special education to help more children benefit from well-designed educational environments that support them in realizing their potential with dignity.

Philip Riedel
AIA, ALEP, LEED AP, Principal

Alyson Mahoe
Research & Experience
Development Department

**HIGHLY SPECIALIZED
SCHOOLS CAN OFTEN
GIVE STUDENTS WITH
INTENSIVE NEEDS
THE BEST EDUCATION
POSSIBLE WHILE
SUPPORTING THEM
MEDICALLY.**

INCLUSION AND SPECIALIZATION

Providing the best educational support for special education and medically fragile students requires collaboration between teachers, therapists, medical professionals, and parents. It is important for all participants to build trusting relationships, keep the lines of communication open, and strive to increase family engagement.

Having the proper training is critical for teachers to focus on the inclusion of students with disabilities. Despite federal and state efforts to standardize teaching, the special education teacher ultimately is responsible for employing best practices and implementing the appropriate intervention—growing from students' current levels of performance, and meeting their social, emotional, behavioral, and intellectual needs.

Although inclusivity is important, many schools are not fully equipped or prepared to serve medically fragile children. Sometimes criticized for segregation, highly specialized schools can often give students with intensive needs the best education possible while supporting them medically. These schools have an increased ability to adapt the learning experience to suit each child's individual needs.



CONSIDERATIONS

DESIGN CONSIDERATIONS FOR THE BUILT ENVIRONMENT





CONSIDERATIONS FOR THE BUILT ENVIRONMENT

As an education design firm, NAC understands the importance of designing schools where all students can achieve their highest level of potential despite any physical or mental limitations. There is not a one-size-fits-all model, so each school design must incorporate the best available information about current and future student populations in order to accommodate as much diversity as possible.

Most design considerations for special education are good practice for all education environments. The Massachusetts education research nonprofit, CAST (Center for Applied Special Technology), promotes Universal Design for Learning (UDL), which posits that the learning environment and curriculum should be designed to accommodate the full diversity of students. The principles of UDL focus on minimizing barriers and maximizing learning, going beyond requiring access to providing support for all learners. While critical for special needs students, ensuring great classroom acoustics, easy connections to outdoor spaces, and straightforward wayfinding benefits everyone.



IDEA ELIGIBILITY

Students diagnosed with one or more of the disabilities listed below, and who require special education instruction and/or related services, are IDEA-eligible. States may choose to add additional categories to the list in the federal statute, and the statutory language may vary somewhat from state to state as well. For example, a student between the ages of three and five years who is evaluated as having an intellectual disability, emotional disturbance, specific learning disability, or autism may be described as non-categorical early childhood eligible at the state level.

The federal list is as follows:

- > Autism
- > Deaf-blindness
- > Emotional disturbance
- > Hearing impairment
- > Intellectual disability
- > Multiple disabilities
- > Orthopedic impairment
- > Other health impairments
- > Specific learning disability
- > Speech or language impairment
- > Traumatic brain injury
- > Visual impairment

DIGNITY AND USER EXPERIENCE

When designing for students with disabilities, it is important to maintain their dignity. Accommodations should avoid separating them from their peers in the instructional setting, drawing unusual attention to them, or limiting their education.

One should not design for the diagnosis, but rather for the best predictable user experience. Due to the variety of sensory differences, it is necessary to consider the potential for severe reactions to sensory elements.

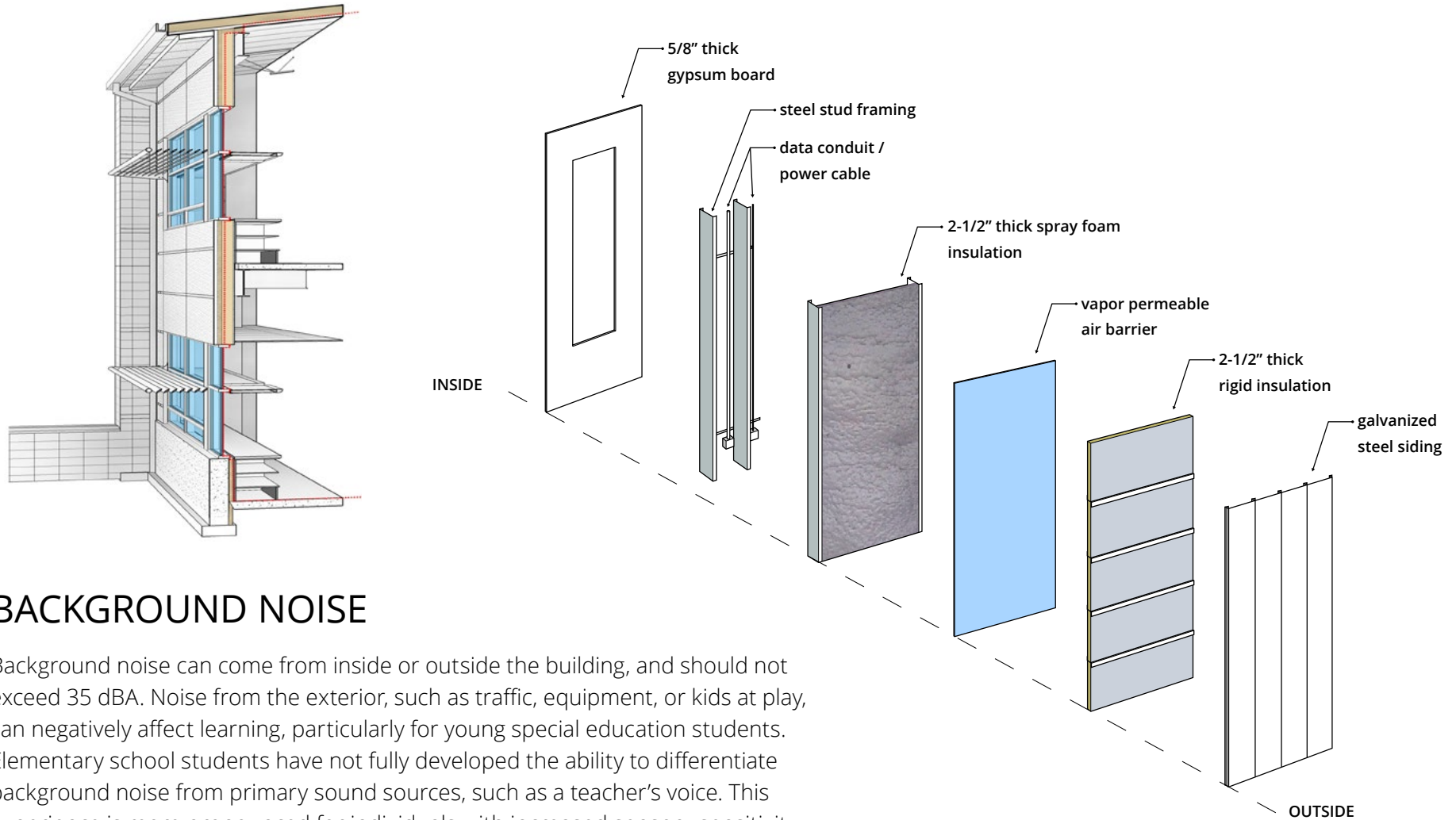
Understanding and thoughtfully considering the possibilities is essential when creating an environment that enhances learning for all students. Our goal is to rethink design to encompass a broad spectrum of sensory, cognitive, and social differences, offering opportunities to foster social inclusion and enhance wellbeing.



Hamlin Robinson School (designed for dyslexia),
NAC Architecture

ACOUSTICS

Acoustics are among the most important factors when designing a special education school. The shape and surfaces of a room have a direct impact on acoustical comfort and speech intelligibility. While good classroom acoustics benefit all children, they are critical for students with auditory processing disorders, speech and language delay, or attention issues. Thoughtful material choices and layout can significantly reduce noise distraction, including background noise, reverberation, and sound transfer throughout the building.



BACKGROUND NOISE

Background noise can come from inside or outside the building, and should not exceed 35 dBA. Noise from the exterior, such as traffic, equipment, or kids at play, can negatively affect learning, particularly for young special education students. Elementary school students have not fully developed the ability to differentiate background noise from primary sound sources, such as a teacher's voice. This experience is more pronounced for individuals with increased sensory sensitivity.

Luckily, controlling outside noise is fairly straightforward. Good building practices for thermal insulation, such as sealed insulated window units, wall insulation, and mass, are effective in reducing the impact of exterior noise on the interior. Accordingly, exterior equipment (heat pumps for air conditioning systems, electrical generators, etc.) should be located or separated to prevent noise intrusion.



Happy Valley Elementary School, NAC Architecture



Hazel Wolf K-8 School, NAC Architecture

REVERBERATION

Controlling reverberation inside rooms is a key to creating great learning spaces, because excessive reverberation can directly reduce speech intelligibility and produce a buildup of noise. Sound bouncing off hard, reflective materials causes reverberation, while absorptive material on various surfaces reduces reverberation. A material's effectiveness is measured in its NRC, or noise reduction coefficient. We recommend that ceilings in learning spaces include high-NRC tiles.

Carpeting on floors goes a long way to control reverberation, but is not desirable in all special education spaces due to cleanability concerns. Absorptive panels on walls, along with curtains or shades on windows, can further lower reverberation times. An acoustical engineer can digitally model the room to determine the optimal placement of absorptive panels. Because high-NRC materials are typically porous, it is important to balance cleanability with acoustic properties, particularly for medically fragile programs.

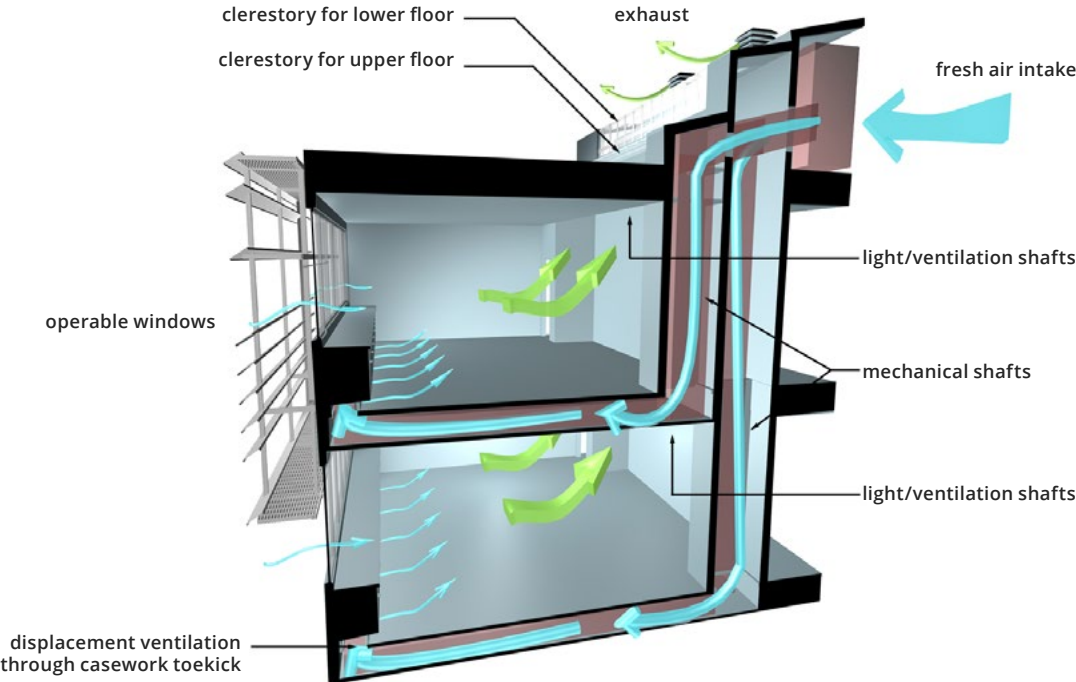
**ACOUSTICAL
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SOUND TRANSFER

Mechanical systems are another source of noise in schools. Noise from fans and grilles enters rooms directly, and noise from equipment in mechanical rooms can be transferred through the building structure to impact learning spaces. Several measures, such as lining ducts with insulation, sizing fans and ducts appropriately, and providing sound isolation for equipment helps to minimize noise.



Wilson High School, NAC Architecture



DISPLACEMENT VENTILATION DIAGRAM

Noise should also be a consideration when determining the type of HVAC system for a school. We have found that one of the most effective is thermal displacement ventilation. This means that air is introduced slowly and low into the room, then naturally rises as it is heated by occupants, and finally exhausts at the ceiling. The system is energy-efficient, but its main benefits are being very quiet and improving indoor air quality over traditional air mixing systems.

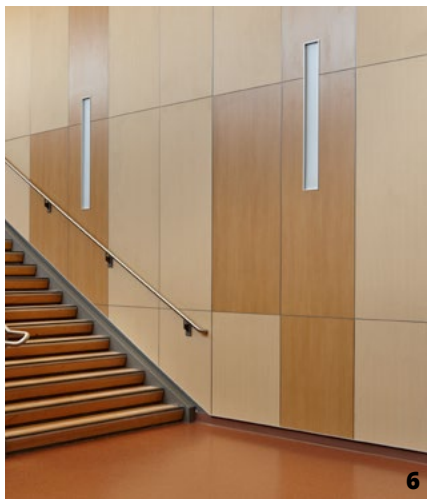
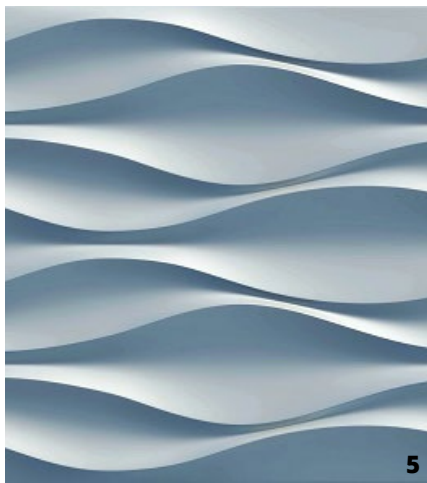


AESTHETICS (SENSORY EFFECTS)

Due to neurological differences and deficiencies, how individuals perceive and interact with their environment can vary substantially. The ability of students to focus on tasks and instruction is directly affected by the aesthetic conditions in a school, including lighting, color, and sensory stimulation.

There is a benefit to creating a learning environment similar to the place where students are most comfortable: home. For students on the autism spectrum in particular, a less institutional-feeling building reduces the apprehension and anxiety that can trigger symptoms. This starts with the school's approach and entry, which can be designed to a reduced scale recalling a residential porch, and carry throughout the interior spaces. Avoiding shiny, reflective surfaces and fixtures, while ensuring that materials are easy to clean and maintain, and keeping ceiling heights relatively low (10 feet or less) are comforting measures for many of these students.

**THERE IS A BENEFIT TO
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COLORS AND MATERIALS

The variety of sensory differences means that color and material selection can have important implications. We recommend muted shades of blue, green, yellow, and natural colors, as they tend to be calming for most people. Avoiding bright colors and strong patterns helps to reduce adverse sensory affects for students with hyper-sensitivities. A range of touchable and durable materials offers options for students with tactile sensitivities, but should be limited to selected locations. Extremely tactile materials can trigger “stimming” (self-stimulation or stereopathy), which is calming but can become excessive and interfere with learning.

All materials should be non-glare and non-toxic. Students with sensory disorders can perceive glossy flooring as a wet surface and may avoid walking on it. Preventing toxicity is important in all schools, but particularly in special education environments where students are expected to touch and interact with all materials. Certain medical conditions may also increase sensitivity to volatile organic compounds and other toxins in the built environment.

1—Textured solid laminate by Wilsonart; 2—Stevens Creek Elementary, NAC Architecture; 3—Sound channels by AcousticsFirst; 4—Grapeview K-8 School, NAC Architecture; 5—Wave 63 by Textures 3D; 6—Riverview Elementary, NAC Architecture

LIGHTING

The best lighting strategy for education facilities is to provide a range of customizable options. Natural light is typically beneficial, but it is not universally calming, so blinds or blackout curtains must also be available. Bright or fluorescent overhead lights are often disorienting for those with sensory sensitivities, and can even cause pain. Full-spectrum LED lighting is preferred, and color-tunable LED lighting is worth considering in certain spaces. Lights should have dimmers to allow users to customize a room.



Music room with natural light and blackout curtain to adjust light levels and provide acoustic absorption.
Grapeview K-8 School,
NAC Architecture

SENSORY STIMULATION

Sensory stimulation helps users engage with and explore their surroundings, which is especially beneficial when students are beginning to learn how to react and interact with the much larger world around them. This experience employs different areas of the brain and helps children better absorb and retain information, and improves balance, movement, and spatial orientation.

It is also important to provide escape spaces and low-stimulation respite rooms to allow students to take a needed break and control the stimulation.



An enclosed outdoor courtyard provides active movement opportunities with multiple surface types, while nearby indoor spaces allow a student to withdraw when needed. Bennett Elementary School, NAC Architecture



BIOPHILIC DESIGN

Biophilia comes from the Greek words “bios,” meaning life, and “philia,” meaning fondness. Biophilia is the innate human love of life, or our affinity for living things. Biophilic design is a human-centered approach, with the goal to connect people with nature. Interfacing with nature complements our technology-rich environments by fulfilling a basic human need.

Research demonstrates that directly and indirectly incorporating elements of nature into the built environment reduces stress, blood pressure, and heart rates, while increasing productivity, creativity, and well-being.

In schools, natural lighting, views of nature, and areas for outdoor learning have been shown to increase attention and retention of information, and reduce disciplinary incidents and ADHD symptoms. Distant views to the exterior, particularly of greenery, help to reduce ocular fatigue. Benefits to student engagement and creativity have also been reported.



Cherry Crest Elementary School, NAC Architecture

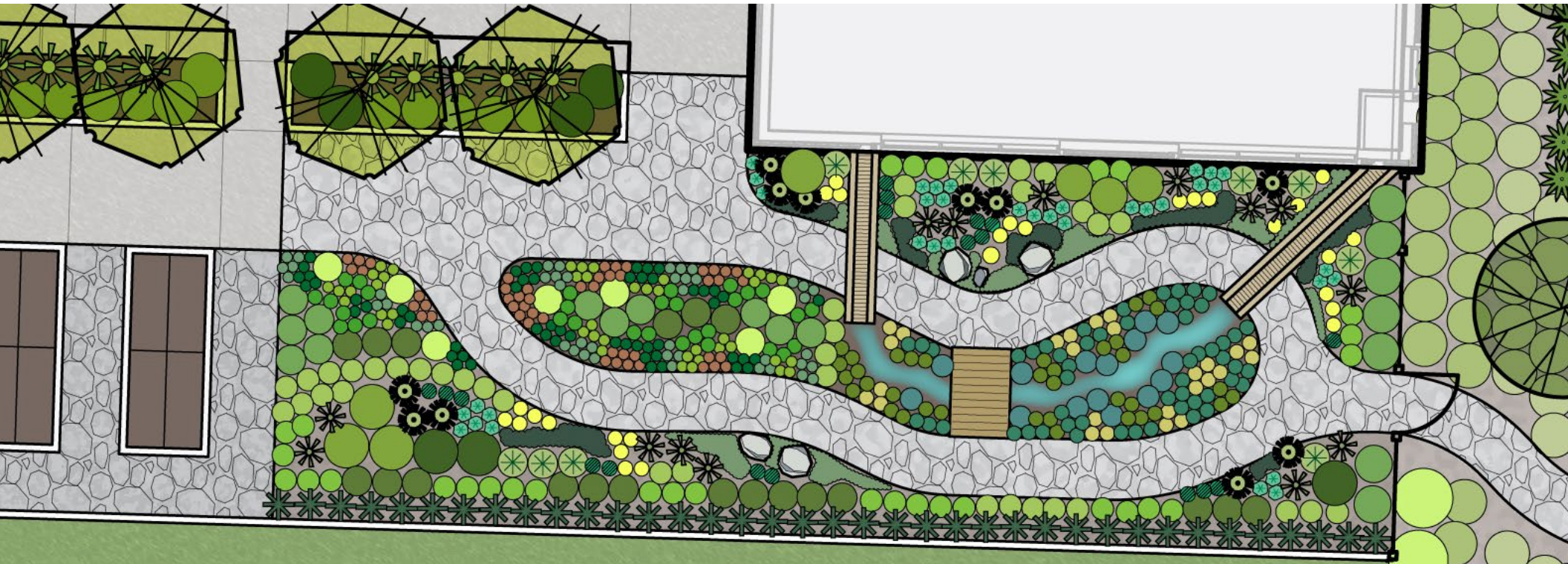


Often designers will consider obvious connections with nature, such as air, water, sunlight, color, plants, and views. Relating a building to its context also involves landscape, culture, and history, which can spark curiosity and mental stimulation and encourage self-directed discovery. Unprogrammed spaces and features can allow students the freedom to imagine and use their environment as they see fit.

“CHILDHOOD IS CONSIDERED AS THE TIME WHEN EXPERIENCING NATURE IS MOST ESSENTIAL TO HUMAN PHYSICAL AND MENTAL MATURATION.”

— Dr. Stephen R. Kellert

Stevens Creek Elementary School, NAC Architecture



The sensory garden at Wilson High School is specifically designed for the autism program, with plants chosen for their textural and relaxing aromatic properties, a circuitous gravel pathway, and a flat bridge across a natural water feature. NAC Architecture and Weisman Design Group

LIMITS OF CURRENT RESEARCH

The impact of biophilic design on learning in the general student population has received significant attention and increased understanding, but the advantages for special education are less known. Sensory gardens have been successful in providing autistic students relief from overstimulating environments and restoring a sense of calm. Special education teachers are well aware of the benefits their students receive from time spent outside, such as fostering curiosity and releasing energy. Although formal research is not available to demonstrate conclusively that biophilic design helps students with specific conditions, the human appeal of biophilic attributes is strong enough to recommend these strategies in school designs for all students.



BUILDING SECURITY

Of course it is important to design schools that are safe and protected. This not only refers to outside factors, but to student safety inside as well. Special education students can be at an increased risk of bullying, so transparency into all shared spaces supports passive supervision throughout the school.

At special education schools, some students have a greater propensity than the general population to attempt to leave. About half the students on the autism spectrum have a tendency called wandering or elopement. Departing from the building unsupervised is extremely dangerous. Careful placement of entries/exits during the design process minimizes the potential for student flight. Outside areas, such as a sensory garden, need to be fenced with controlled access points. Even where exterior classroom doors are lockable, it is often worth installing a chime to alert teachers when the door is opened. Such exterior areas should also be directly visible from the classroom.

Lake Stevens Early Learning Center, NAC Architecture



Bennett Elementary School, NAC Architecture

CAREFUL PLACEMENT OF SCHOOL ENTRIES/EXITS DURING THE DESIGN PROCESS MINIMIZES THE POTENTIAL FOR STUDENT FLIGHT.

Other current school security strategies should also be employed. These measures include limiting the entries and exits required for school operations; a secured vestibule at the main entry to divert visitors through the reception area while school is in session; several layers of secured perimeter for lock down (i.e. site fence, building perimeter, building wings, and classroom levels); security cameras and alarm systems; and armoring, such as laminated glass. An additional security consideration is how best to facilitate evacuation, as described under the Emergency Preparation section below.

Another security issue involves areas within the school that pose a threat of injury. It is important to pay attention to mechanical rooms, storage rooms, and other places with equipment or supplies that could be dangerous. Preventing access to students with disabilities, such as autism and other cognitive issues, is a critical design consideration and necessary focus of operational procedures.



Community room at Lake Stevens Early Learning Center, NAC Architecture

COMMUNITY AREAS

Special education school design must define which areas are shared community spaces and which are only occupied by students and staff. The building should be zoned to allow appropriate access during and outside of school hours to support and encourage community functions.



PARENTS NEED SPACES TO MEET, STORE THEIR BELONGINGS AND SOCIALIZE ON CAMPUS DUE TO THE AMOUNT OF TIME THEY SPEND AT THE SCHOOL.

PARENT SPACES

Parents of children in special education are inherently committed to being deeply involved in their children's school. They spend a great deal of time on campus meeting with administrators and staff, observing their children, and volunteering in classrooms. Designing for special education must also acknowledge their needs, and provide community spaces where they might store their belongings, meet with other parents, share resources, organize fundraising events, and socialize. Designated areas could involve a library, auditorium, or multipurpose rooms.

As a community gathering place, the school design should be welcoming with a prominent entry, intuitive wayfinding, accessible and comfortable waiting areas, and appropriate meeting spaces.





+ EMERGENCY PREPARATION

The vulnerable populations at special education schools require specific attention to emergency planning and adequate exits, allowing all staff and students to evacuate easily during an emergency. These efforts must balance with the needs described in the Building Security section above, providing ease of egress without enabling students to wander. In response to complex issues, the minimum code requirements for a typical school are likely to be insufficient.

Due to certain medical needs, there may also be times when a student must be quickly transported to a local hospital. An ambulance route to and from the school, along with an emergency pickup area, should be planned and designated on site.



EQUIPMENT AND FURNITURE

Specialized equipment and furniture, such as foam wedges, therapy balls, walkers, and swings help staff and students to customize use to particular needs. These options are important to accommodate a wide range of learning activities, but require additional space and placement consideration. Overhead electrical outlets enhance versatility, functionality, and emergency preparedness by allowing equipment and rooms to be movable.

DESIGNING FOR SPECIAL EDUCATION



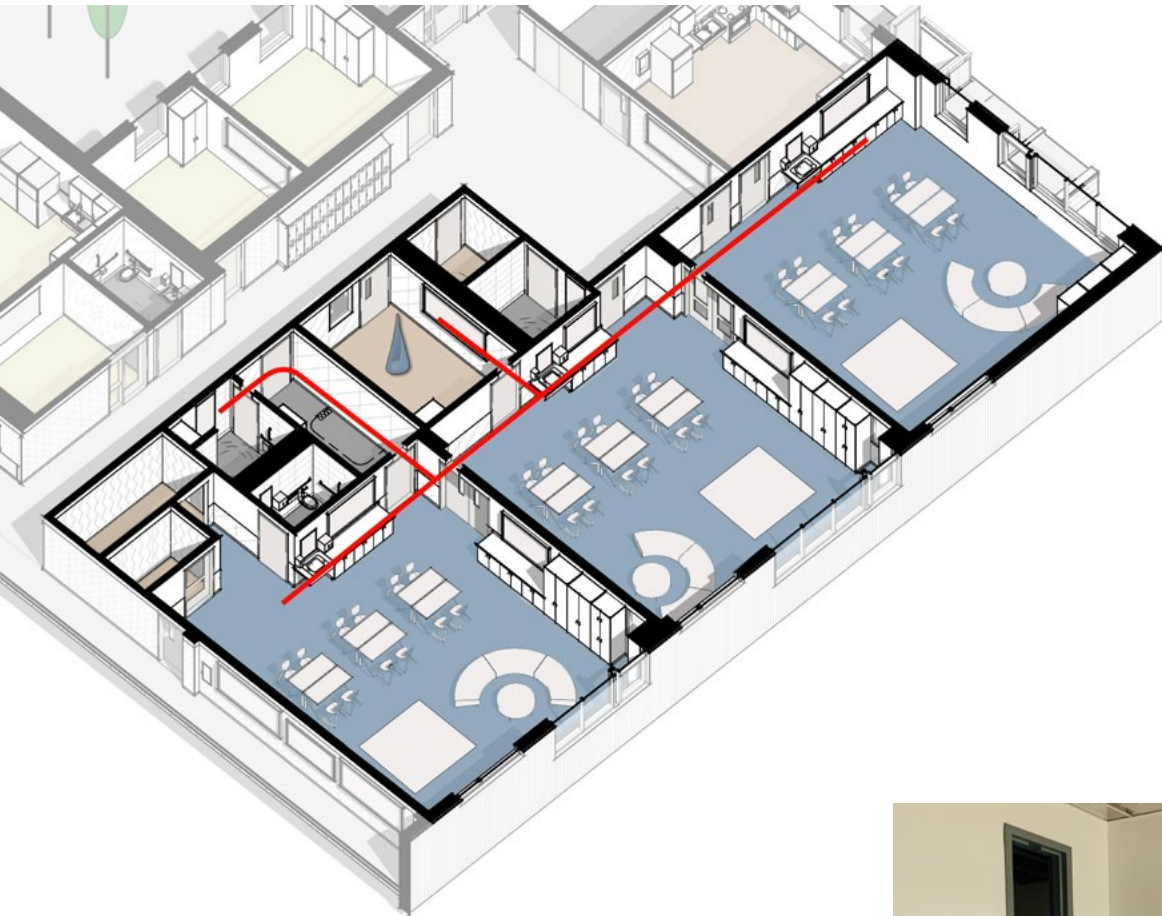
Schools require significant storage space for walkers, standers, and gait trainers, as well as for therapy balls, wedges, seat cushions, and other positioning equipment.

Classroom desks and chairs should have cushioned feet to reduce sound, and be too heavy for students to pick up or move easily. Weighted products that attach to chairs and tables provide an alternative to heavy furniture. Some students benefit from carrels enclosed on three sides to reduce distraction, but a portable privacy screen can serve the same purpose.


Sensory rooms involve a wide array of items, including active seating to accommodate movement, soft seating, such as foam or beanbag chairs, tactile textured surfaces, and lighted elements.

1—Bioform wedges by Tumbleforms; 2—Weighted blanket by Abilitations; 3—MSS Mobile floor sitter by Skillbuilders; 4—Universal Grasshopper by Tumbleforms; 5—Comfy Back Bantam by Easy Stand; 6—Zero Tricycle by Italtrike

DESIGNING FOR SPECIAL EDUCATION



Mt Si High School, NAC Architecture

 ceiling mounted track

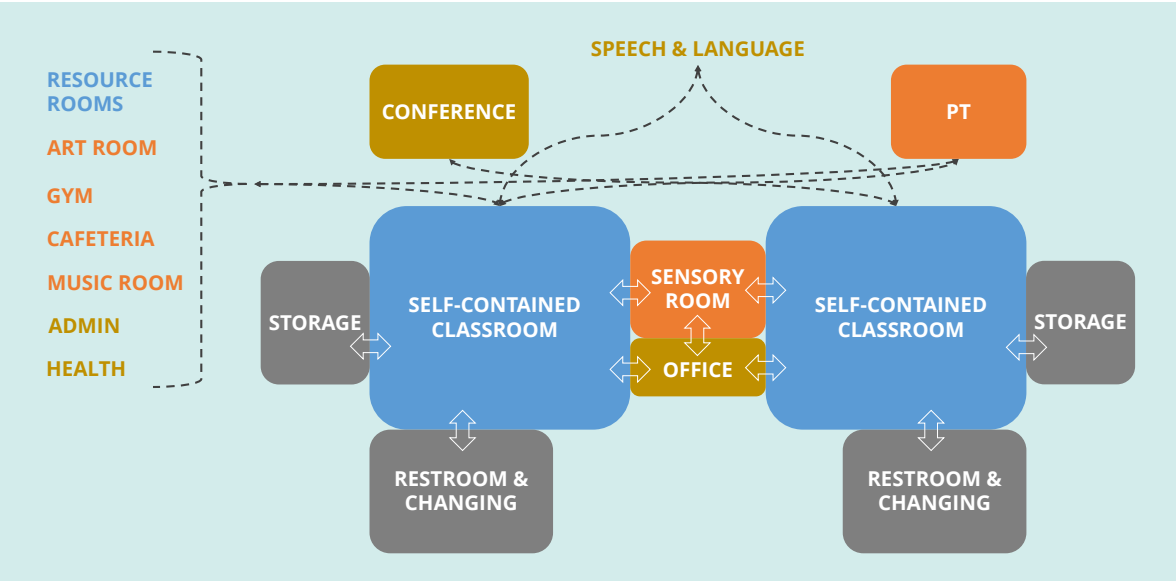
At Mt. Si High School, door frames in the special education classrooms are modified to fit a continuous ceiling-mounted track for powered transfer lifts.

Transfer lifts, also known as patient lifts or Hoyer lifts, must be accommodated—either floor mounted or on ceiling tracks. If using a ceiling track, any doors in the path of travel must be adequately tall.



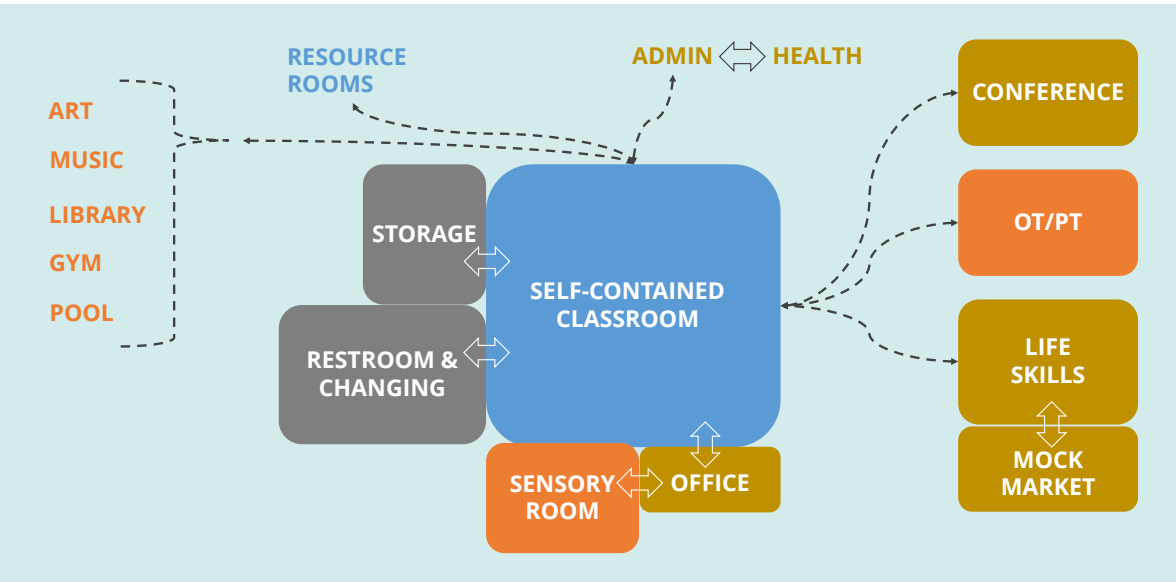
Ceiling track by SureHands

DESIGNING FOR SPECIAL EDUCATION



LAYOUT

In considering layout and adjacencies, be sure to separate high-stimulus areas from low-stimulus areas. High-stimulus areas include art rooms, media rooms, cafeterias, gyms, and makerspaces. Low-stimulus areas provide places to focus, such as classrooms, one on one conversation areas, and study spaces. Transitional spaces between the two types of activities help to mitigate their differences, and allow students to prepare and adjust.





MINIMIZE TRAVEL DISTANCE

The distance students have to travel from one destination to another is an important consideration in any school facility. The time it takes a disabled student can be significantly greater than for non-disabled students, and may require the help of staff.

Centrally located physical education, music, art, the library, food services, and elevators greatly simplifies navigation. Multistory buildings may require more than one elevator to ensure that travel distances are reasonable for disabled students.

SPACES FOR SPECIAL EDUCATION STUDENTS

Special education students in integrated programs and specialized schools require access to the entire school. Even students in intensive self-contained programs in a larger school will need access to a variety of spaces:

- > Administration
- > Physical education, including accessible access to a pool if available
- > Music
- > Art
- > Library/Media Center
- > Food Services
- > Makerspaces or Da Vinci Lab
- > OT/PT rooms
- > Health center





Hazelwood School Glasgow by Alan Dunlop Architect. *Photo by Andrew Lee.* Hazelwood School serves blind and deaf (dual sensory impaired) students aged 2 to 18, many of whom also have physical and cognitive impairments. Wayfinding was developed using touch-based cues to allow these students to navigate their spaces.

WAYFINDING

Most experts recognize the importance of wayfinding to assist students with special needs. The building itself can function as a navigational tool if layouts are kept simple, and visual and tactile cues are consistently applied throughout. Effective design and zoning empowers students to develop their own wayfinding skills, which increases independence, frees staff, and further supports the overall mission of the school.

The success of specific wayfinding strategies depends on aligning strategies with the student population. For some, the focus will be on intuitive visual cues, such as color, to enhance their awareness of locations. Students with sight impairment will depend on tactile signals. Braille signage should be the right height for children, rather than mounted according to ADA signage standards. Changes in materials can provide additional tactile insights.



OUTDOOR SPACE

Outdoor spaces for playing and learning are part of providing all students with the best educational experience. Strategies should include a welcoming outdoor environment with wayfinding, transition spaces, and sensory stimulation. Wide, gradual ramps between different levels on site are preferable to stairs plus ramps as the “alternate” means of getting from one level to another. Whenever possible, only provide a ramp, and size it for everyone to use.

DESIGNING FOR SPECIAL EDUCATION



For school arrivals and departures, it is important to provide adequate drop-off zones, keeping in mind that some students will be taking school buses, some transported in vans, and some arriving in parents' cars. The number and size of accessible parking spaces and curb cuts for wheelchairs will likely exceed the code minimums for size and quantity. For the main drop-off zone, flat transitions with bollards in lieu of curb cuts are an effective means to separate pedestrian traffic from vehicles. During construction, care must be given to vault lids and drain grates to ensure they are installed flush with paving surfaces.

Dividing outdoor spaces into "rooms," each with a different character or theme, will avoid monotonous wide-open spaces. Combining a variety of outdoor play areas with adaptive equipment and intimate spaces for independent activities will allow all students to enjoy the playground.

Sensory gardens, as shown in the section on biophilia, are a great way for students to see, touch, and smell plants, logs and boulders. Wheelchair-accessible gravel or rubberized pathways provide an interesting texture for traveling through the garden. Water features that capture rain can further enhance students' outdoor experiences and connect them to the natural environment.



PRIVACY

The current literature on special education spaces lists multiple sources describing the inadequacy of existing facilities to perform invasive procedures, such as injections, insertions, and suctioning. Lacking privacy, hot water, or other proper sanitation, these less than optimal conditions jeopardize the staff's ability to provide proper care.

Ideally, designated staff members perform these tasks, but this is not always possible. Separate rooms or mobile screens can help to balance privacy and supervision needs when staff may be treating one student while overseeing others. Privacy rooms with glass relites into classrooms or other student spaces, along with blinds, are effective in controlling the level of privacy for each situation.



TRANSITIONS

Transitioning from one activity to another can be challenging for some students, so it is important to consider how to introduce change through the built environment. By altering the ceiling height, building level, flooring type, and wall colors, or providing a seating nook, the built environment can aid students in moving to the next activity. While differing from adjacent areas, these threshold spaces should provide a gradual rather than an abrupt transition.

Instead of dedicating large areas solely to circulation, it is beneficial to provide places for informal learning activities that help to modulate transitions, as long as adequate pathways are kept clear. These transitional spaces serve a social/recreation function, allow for unscripted play, and offer breakout space for a paraeducator to work with one or two students. In addition to easing movement from a classroom to a main corridor, this type of use can enhance social-emotional learning and remove potentially distracting activities from the classroom.



SPACE TYPES

SPECIFIC SPACES TO GET RIGHT





SPACES WITHIN A SCHOOL

While a special education school will encompass spaces typical of all schools, such as a cafeteria, kitchen, gym, and administration offices, certain areas will need particularly careful consideration of function, room size, and adjacencies, as well as special equipment and furniture.

Every aspect of a school building and its site must meet ADA accessibility requirements, and designers are well versed in how to achieve them. However, minimum standards are not enough for schools with high special needs or medically fragile populations. The current ADA design guidelines do not address the newer, wider versions of motorized and reclining wheelchairs that have larger turning radii. For special education schools, designers must meet with staff to determine the necessary maximum dimensions, and then size pathways, ramps, corridors, doors, and elevators accordingly.

In this section, we will explore the criteria we use to better accommodate students with special needs.



Wilson High School, NAC Architecture

CLASSROOMS

Due to special education students' wide range of needs, design resource rooms and self-contained special education classrooms not only to accommodate, but also to maximize each child's potential. These welcoming and inclusive rooms must be ADA-accessible and take advantage of the benefits of universal design, which focuses on usability for all, rather than the mythical "average" user. The layout should enable teachers and paraprofessionals to access student areas easily. Reducing the amount of visual and auditory stimuli in the classroom environment can further enhance learning and decrease distraction.



DIFFERENTIATING CLASSROOM AREAS PROVIDES PREDICTABILITY FOR THE STUDENTS, HELPING WITH TRANSITIONS BETWEEN ACTIVITIES AND IN REDUCING STUDENT ANXIETY.

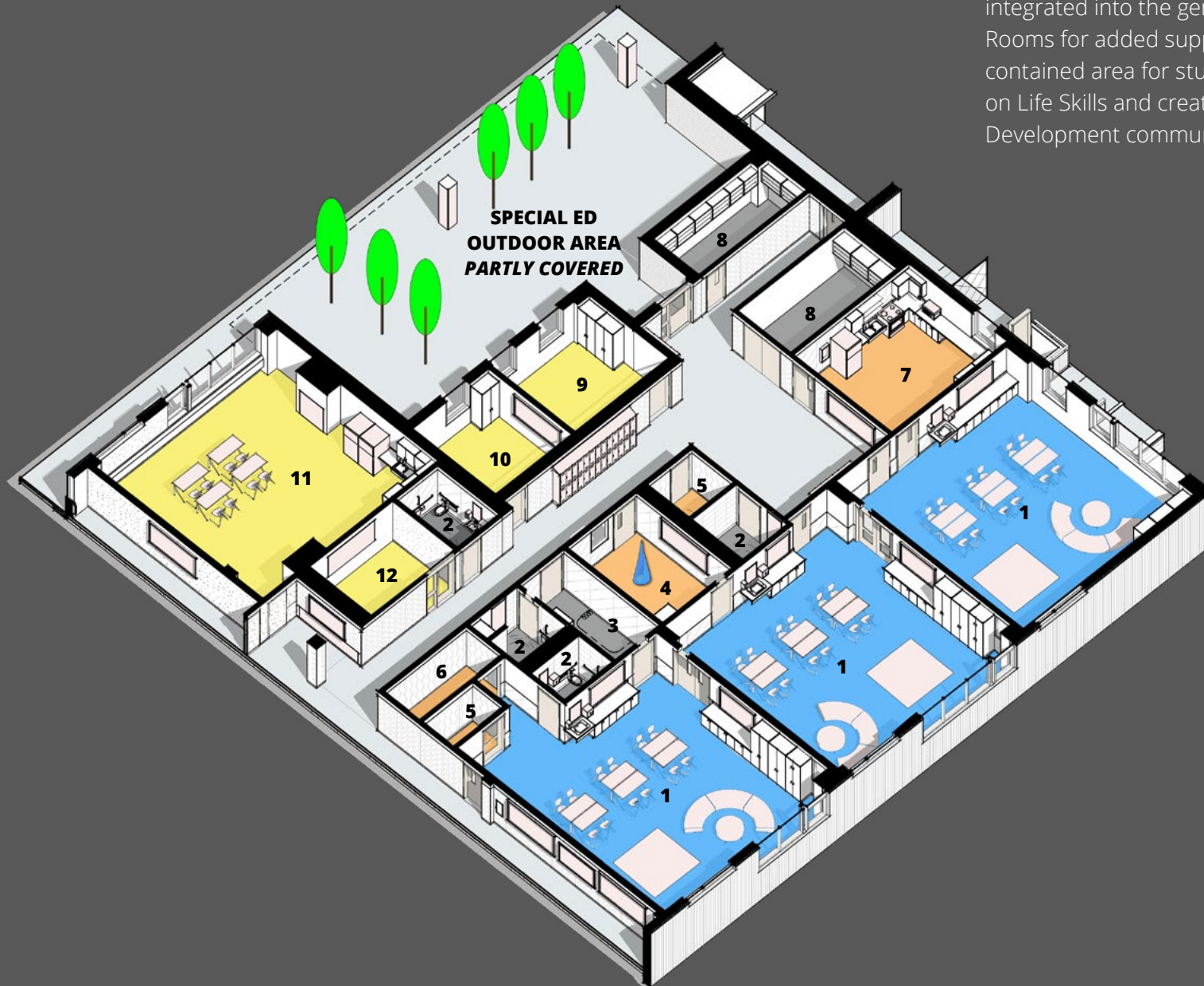
Zoning classrooms with well-defined areas cues students about the activities occurring there, and helps them to understand their roles. Differentiating classroom areas provides predictability, eases transitions between activities, and reduces student anxiety. With areas customized for each program, as well as for specific IEPs, potential classroom areas include: a home area for doing individual work; areas for whole-group instruction and small group work; a visual schedule area for planning transitions; a comfortable area for reading; and a teachers area (or a separate teachers office). Depending on the program, other stations may be set up specifically for math, computers, writing, art, etc. Often an L-shaped rather than a rectangular classroom makes it easier for teachers to define distinct areas. Cabinets and movable dividers can provide clarification, but visual supervision must be maintained in each case. High activity areas that invite group work should be located remotely from quiet areas for individual activities, such as reading.

When designing special education classrooms, the attributes described in the Considerations section of this guide are of key importance. For example, acoustics are a vital feature; automated sensors for sinks promote accessibility and sanitary hand-washing; appropriately placed medical equipment with adequate secured storage benefits medically fragile students; placing electrical outlets up high prevents student access; modular furniture, too heavy to move, accommodates a variety of needs; adjustable height tables suit a wide range of uses.

DIAGRAM OF SPACES

MT SI HIGH SCHOOL, NAC ARCHITECTURE

Most special education students at Mount Si High School are integrated into the general education program, with Resource Rooms for added support. As shown in this diagram, a self-contained area for students with intensive needs focuses on Life Skills and creating a collaborative Professional Development community.



- | | |
|----|-------------------------------------|
| 1 | SELF-CONTAINED SPECIAL ED CLASSROOM |
| 2 | RESTROOM AND CHANGING |
| 3 | PRIVACY AND MEDICAL |
| 4 | PHYSICAL THERAPY ROOM |
| 5 | QUIET ROOM |
| 6 | SENSORY ROOM |
| 7 | LIFE SKILLS LAB |
| 8 | SPECIAL ED PROGRAM STORAGE |
| 9 | LIFE SKILLS OFFICE |
| 10 | SPEECH/LANGUAGE OFFICE |
| 11 | TEACHER PLANNING ROOM |
| 12 | CONFERENCE ROOM |



LIFE SKILLS ROOMS

One very important aspect of special education, particularly at the middle and high school levels, is helping students learn to live independently. Life skills (also known as functional skills), such as cooking, cleaning, laundry, grocery shopping, and balancing a checking account are all important activities to master. Learning could take place at a station in each classroom, or in a specific room containing kitchen, laundry, bedroom furnishings, and equipment. In some cases, students could participate in these activities as assistants in staff areas.

Providing learning opportunities for each student anticipates that individuals or small groups will work with educators or paraeducators in different stations at the same time. As such, it is helpful to identify a wall area near the entry for pinning up a schedule.

Each activity area should look as realistic as possible, with standard residential equipment. Kitchen equipment is needed for students to learn to cook safely and take care of a kitchen. A laundry area will help prepare students to sort, wash, and fold their own clothes. Some schools set up a mock grocery store with a stocked shelf and a table serving as a checkout counter to teach shopping skills, which can be tied into activities for preparing meals.



Enumclaw High School, NAC Architecture

EQUIPMENT AND FURNITURE CONSIDERATIONS:

- > Kitchen equipment to be able to cook and take care of a kitchen.
- > Laundry area for students to be able to learn how to do laundry

DIAGRAM OF SPACES

ENUMCLAW HIGH SCHOOL, NAC ARCHITECTURE

The Special Education wing at Enumclaw High School contains intensive Self-Contained Classrooms, as well as a variety of facilities and meeting spaces to support special needs students who are integrated into the general education program. The Transitions Classroom includes a mock market for practicing shopping interactions. The Self-Contained Classrooms focus on life skills and leisure, with a residential Life Skills Lab located between the two.



- 1 SELF-CONTAINED SPECIAL ED CLASSROOM
- 2 RESTROOM AND CHANGING
- 3 LIFE SKILLS LAB
- 4 SPECIAL ED CONFERENCE ROOM
- 5 HOME BASE
- 6 GROUP ROOM
- 7 SPECIAL ED PROGRAM STORAGE
- 8 TRANSITIONS CLASS
- 9 TRANSITIONS MARKET



OT/PT ROOMS

Providing a dedicated room for occupational and physical therapists to work one on one with students is extremely important in a special education school. These professionals focus on removing barriers from students' ability to learn, and helping them to develop skills to increase their independence in the school environment.

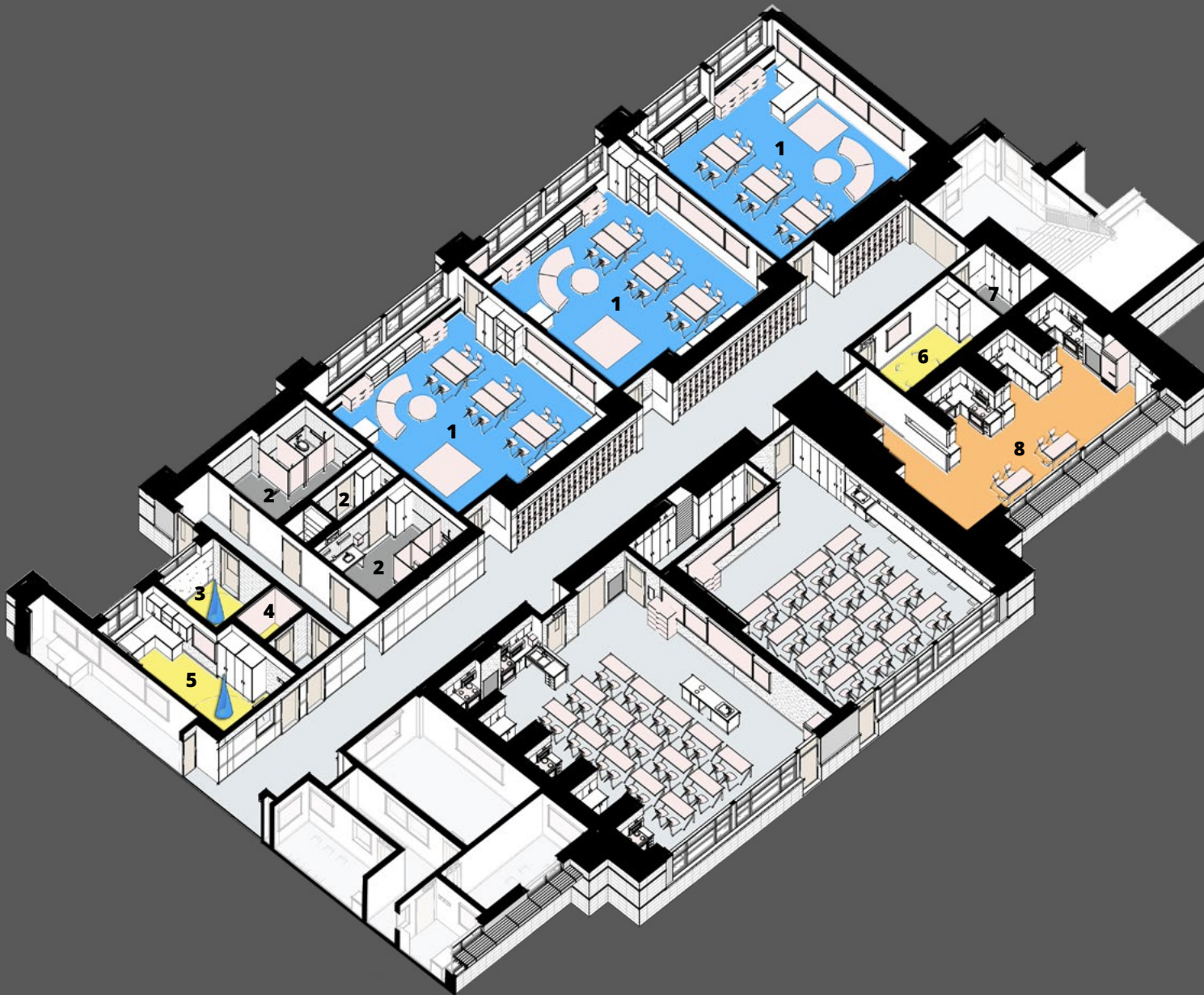
When designing an OT/PT room, an open, flexible space will allow for a variety of movement and equipment to serve the each student's needs. It is also necessary to consider how many students will use the room at once, and provide adequate storage for equipment.

EQUIPMENT AND FURNITURE CONSIDERATIONS:

- > Balance bars
- > Tricycles
- > Floor mats
- > Ceiling hooks to accommodate hanging equipment.



DIAGRAM OF SPACES



AUBURN HIGH SCHOOL, NAC ARCHITECTURE

The Special Ed wing at Auburn High School contains three Self-Contained Classrooms and specialized support spaces. The Sensory Room and OT/PT Room are available to all students, whether or not they are in the self-contained program. The hallway connecting the specialized rooms with the main corridor serves as a transition area for students entering and leaving these rooms.

- | | |
|---|-------------------------------------|
| 1 | SELF-CONTAINED SPECIAL ED CLASSROOM |
| 2 | RESTROOM, CHANGING AND SHOWER |
| 3 | SENSORY ROOM |
| 4 | SAFETY ROOM |
| 5 | OT/PT ROOM |
| 6 | SPECIAL ED OFFICE |
| 7 | SPECIAL ED PROGRAM STORAGE |
| 8 | LIFE SKILLS LAB |



SENSORY AND RESPITE ROOMS

Children need spaces where they can moderate sensory stimulations—“turn down the volume”— and make choices about the extent of their social interactions with peers. Respite rooms provide opportunities for relief throughout the day. Adding customizable options allows for adjusting the rooms to meet the individual’s needs.

Sensory and respite rooms should be located away from busy and noisy areas to allow for comfortable transitions. Flooring with a different tactility helps to introduce the transition, but must be wheelchair-accessible. Temperature control should take heat from electrical components into account.



Snoezelen Room at Pennyman Primary Academy, Middlesbrough, UK

SNOEZELLEN ROOMS

Snoezelen Rooms include the highly developed therapeutic products from the manufacturer, Snoezelen. They can help to improve visual tracking, proprioception, color recognition, physical movement, hand-eye coordination, and relaxation. The company offers a wide variety of products including interactive panels, bubble tubes, projection equipment, fiber optic curtains, and aroma diffusers.

EQUIPMENT AND FURNITURE CONSIDERATIONS:

- > Swing
- > LED light projector
- > LED light rope
- > Weighted blankets

DIAGRAM OF SPACES

WILSON HIGH SCHOOL, NAC ARCHITECTURE

The Special Education suite at Wilson High School is dedicated to students on the autism spectrum who may also have multiple learning, behavioral, and medical conditions. The main classroom includes various activity areas, including a respite corner, life skills area with cooking and laundry equipment, instructional area, and leisure area. Adjacent to the space is a Special Ed office, OT/PT room, accessible restroom with changing table, shower, and Hoyer lift, and quiet room. Outside there is a learning patio with vegetable beds and a sensory garden.



- 1 SELF-CONTAINED SPECIAL ED CLASSROOM
- 2 RESTROOM, CHANGING AND SHOWER
- 3 OT/PT ROOM
- 4 CALMING ROOM
- 5 SPECIAL ED OFFICE
- 6 SPECIAL ED PROGRAM STORAGE

**LEARNING PATIO WITH
RAISED PLANTING BEDS**

**SENSORY GARDEN WITH
GRAVEL PATH, RAIN GARDEN,
BRIDGE, AND TEXTURAL AND
AROMATIC PLANTINGS**

**Sunscreens
mitigate glare
on south-facing
windows**



BATHROOMS

While bathrooms are an important consideration in all schools, placement is crucial in schools accommodating special education and medically fragile students. When a student needs to use the restroom or needs medical attention, there must be a restroom nearby, so proximity to all classrooms and student spaces is a priority. The entries to bathrooms should be observable, rather than located down an unsupervised hallway.

Bathrooms need to be a suitable size to accommodate equipment and assistance. They should have adequate storage space for equipment and supplies. A changing table should be sized appropriately for the grade level served. A shower should be provided, for which a wall-mounted adjustable shower wand and a floor drain are often preferred to facilitate help from an attendant. A shower lock can be located above student reach height, if desired.

Bathrooms need to include a transfer lift, such as a Hoyer lift, which can either be a mobile unit on a floor base or a ceiling-mounted track unit. The lift and associated sling must be sized per the range of students served, and ceiling-mounted tracks must be carefully located to access the toilet, changing table, and wheelchair area. Anticipating the range of student sizes, each lift should come with an appropriate range of slings, because problems can occur when a sling is either too large or too small for the person being lifted.

All surfaces must be easily cleanable. To facilitate sanitary cleanup, sheet products with heat-welded seams and integral cove bases are preferable to tile products. Floors should be sloped toward a floor drain.



Mica Peak High School, NAC Architecture

EQUIPMENT TYPES:

- > Pressalit Care Height Adjustable Changing Table.
- > Horizon Changing Table.
- > Rifton Support Station.
- > Hoyer Lift.

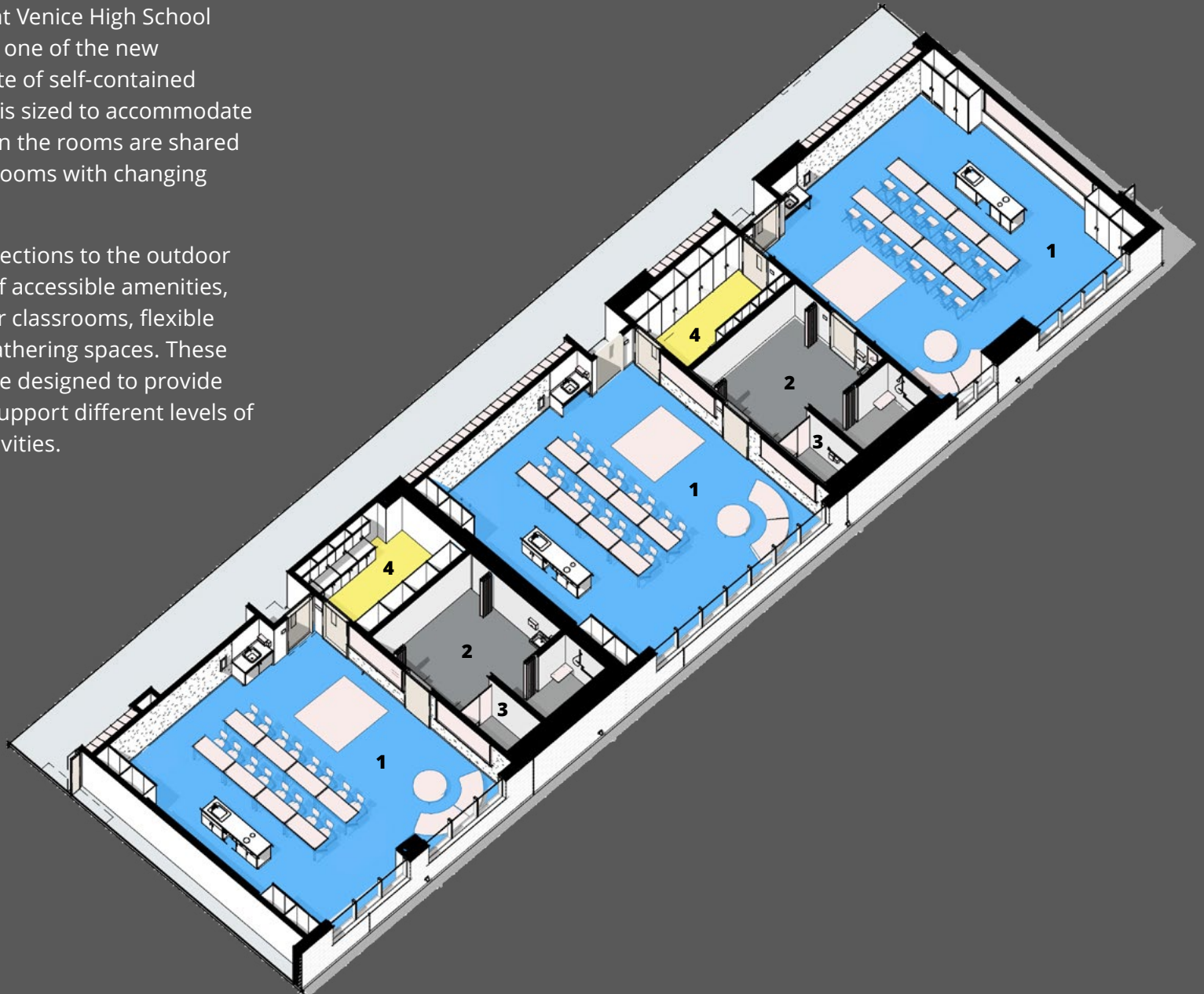
DIAGRAM OF SPACES

VENICE HIGH SCHOOL, NAC ARCHITECTURE

Although most special education at Venice High School integrates with general education, one of the new classroom buildings includes a suite of self-contained special ed classrooms. Each room is sized to accommodate a variety of activity zones. Between the rooms are shared support spaces, storage, and restrooms with changing areas, showers and Hoyer lifts.

The overall design prioritizes connections to the outdoor environment with a wide variety of accessible amenities, including science gardens, outdoor classrooms, flexible event spaces, and other diverse gathering spaces. These landscape and hardscape areas are designed to provide differentiated outdoor spaces to support different levels of social interaction and learning activities.

- 1 SELF-CONTAINED SPECIAL ED CLASSROOM
- 2 RESTROOM AND CHANGING
- 3 SHOWER
- 4 PROGRAM SUPPORT





HEALTH CENTER

Students with chronic and complex healthcare needs often require specialized care at school. Therefore, health centers for special education are more broadly based than a typical school nurse's office, including services for physical, mental, and behavioral health. Full time staff often comprise a nurse practitioner, mental health counselor, and health assistant. Examples of specialized services include suctioning, ventilator support, and tube feeding.

The health center should be easily accessible by medical emergency vehicles. Health centers should be placed near physical therapy rooms and counseling rooms, promoting fluid communication and record keeping to effectively implement students' Individualized Health Plans (IHPs).

Privacy and confidentiality are key elements that can be facilitated by design, such as providing waiting areas out of sight of the main corridor, a secluded examination room, lockable file cabinets, and acoustically private offices for conversations and phone calls. Locked storage, including refrigerated storage, must be available for medications. Overall, health centers should be designed to be inviting and comfortable to minimize the stress levels of students receiving services. This includes good acoustics, controllable natural light, and aesthetically pleasing, cleanable surfaces.

EQUIPMENT AND FURNITURE CONSIDERATIONS:

- > Beds, cots, and other furniture.
- > Lockable storage, refrigerator, and ice machine.
- > Testing and screening equipment.
- > Hoyer lift.
- > Attached restroom, changing table, and shower.



EXAMPLES

CASE STUDIES FROM
AROUND THE WORLD





EXAMPLES

Many schools around the world make special education their primary focus. The following case studies are some of the best recent examples. This is by no means a comprehensive survey, but represents success stories that have caught our attention.

Funding models and educational approaches differ by country, so not everything shown in these projects will be applicable to other locations, but the challenges and opportunities of special education are universal. There is always something to learn from looking at what others are doing well, as we continue to refine our own best practices.



J.P. LORD SCHOOL

OMAHA, NE
BCDM ARCHITECTS

J. P. Lord School in Omaha, Nebraska is part of Omaha Public Schools and serves students ranging in age from 5-21 with a variety of complex needs, including multiple cognitive and physical disabilities. Some are medically fragile, and some may also have hearing, vision, speech, and/or motor impairments. Specific educational and medical needs are met by Lord's twelve special education teachers, 24 paraprofessionals, and two registered nurses. Individualized education plans emphasize a functional curriculum, featuring mobility, communication, and life skills, as well as social, recreational, and leisure opportunities.

The classrooms are divided into clearly-defined areas for different activities, and feature sliding shutters on the windows for storm sheltering if needed. *Photo: Kent Sievers/Omaha World-Herald*

DESIGNING FOR SPECIAL EDUCATION

In 2018, Lord School moved out of a 1938 school building and into a new 45,000 square-foot building designed by BCDM with contributions from Omaha Public Schools and the University of Nebraska Medical Center.

The new school has a wide variety of features customized for its special student population. Abundant natural light is available throughout, with shades or sliding shutters to modulate the daylight when necessary. Wide hallways have adjustable light, textural art that students can feel as they move between spaces, and adjacent nursing stations for quick access. Outside, a blacktop baseball diamond allows children in wheelchairs to play alongside ambulatory students.



A student is wheeled through a transition hallway at J.P. Lord School. Well-defined transitions help many students adjust to an activity change. *Photo: Kent Sievers/Omaha World-Herald*

DESIGNING FOR SPECIAL EDUCATION



◀ The sensory room features a fiber optic curtain in the foreground, adjustable lighting, soft seating, and projected images. *Photo: Kent Sievers/Omaha World-Herald*

▼ The school's zero-entry therapy pool has a rising floor and an underwater treadmill. *Photo: Kent Sievers/Omaha World-Herald*



The sensory room has a wide variety of calming, comforting, and stimulating features. Colors and light levels are adjustable to provide the appropriate environment for users at any time. A fiber optic curtain is similarly adjustable. Nature scenes are projected onto a wall and soothing music is played over the speaker system. Additionally, a sensory gym includes adaptive equipment for universal participation and therapy, along with a zero-entry therapy pool, which was donated by the Omaha Volunteers for Handicapped Children.



The Commons at Bancroft's Welsh Campus is a crucial link between the residential program and the educational facility. *Photo by Edward Caruso, courtesy of KSS Architects*

THE RAYMOND & JOANNE WELSH BANCROFT CAMPUS

MT. LAUREL, NJ
KSS ARCHITECTS

Bancroft's Welsh Campus is a new 178,000 SF facility on an 80-acre property that houses a comprehensive program for children with autism and other intellectual and developmental disabilities. It includes the Bancroft School and Activity Center, as well as the Lindens Neurobehavioral Program, a residential treatment program for children with severe autism. More than 530 special education teachers, paraprofessionals, speech, occupational and physical therapists and medical professionals work on the Welsh campus.

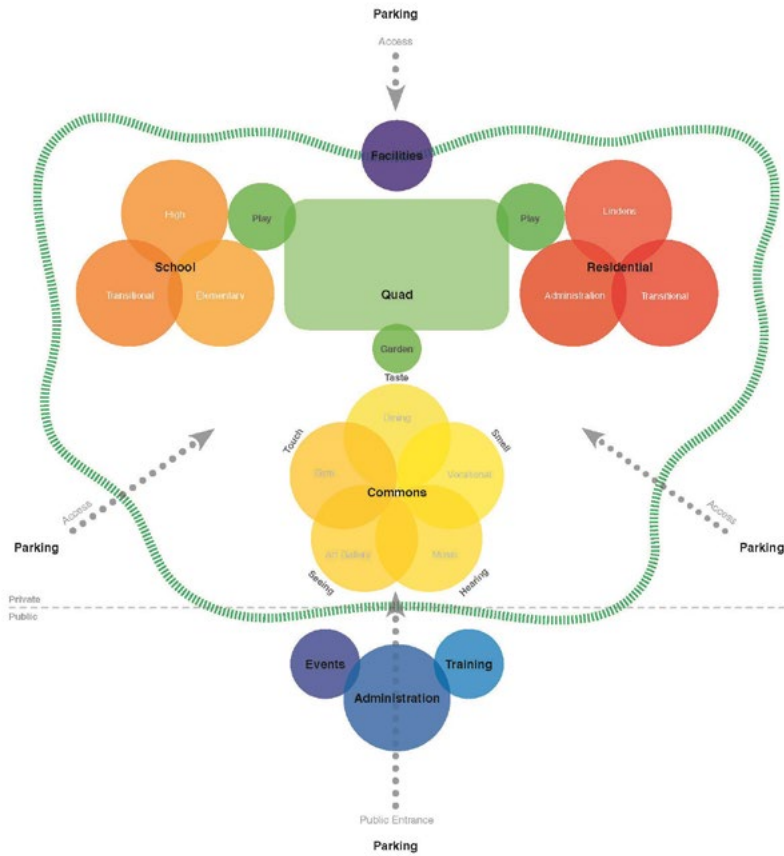
DESIGNING FOR SPECIAL EDUCATION



The design takes into account the academic, sensory, behavior, communication, health, recreation, and social needs of children with special needs. Extensive natural lighting is featured throughout. Teaching kitchens are included for life skills development, and the buildings and site incorporate opportunities for students to engage in indoor and outdoor activity and sensory play, including a horticulture program. The Activity Center includes a gymnasium, activity pool for water safety and swim lessons, indoor play space, vocational storefronts for transitional students, assisted technology center, and space for staff training and meetings.

Photo by Edward Caruso, courtesy of KSS Architects

DESIGNING FOR SPECIAL EDUCATION



▲ A variety of outdoor spaces provides opportunities for environmental learning, recreation and play. *Courtesy of KSS Architects*

The buildings are organized around a series of outdoor rooms that serve a variety of scales and purposes, linked by views and pathways. These buildings and a sensory trail form natural protective edges to the pedestrian campus, with vehicular traffic and parking located along the perimeter. Designed like a village, the campus maximizes opportunities for interaction with families, volunteers, and seniors, and other schools, universities, and businesses.



The curved building shape portrays a less institutional feel and follows the topography of the site, integrating building and environment to create outdoor teaching areas.

Photo by Andrew Lee

HAZELWOOD SCHOOL

**GLASGOW, SCOTLAND, UK
ALAN DUNLOP ARCHITECT**

Hazelwood School, located in a parkland setting to the south of Glasgow, focuses on teaching life skills to children ages 2-19 with severe needs. The school caters to autistic students with acute visual impairment, hearing impairment, mobility, or cognitive impairment. Alan Dunlop's design is the result of a four-year design, consultation and construction process, involving parents, teachers, clinicians, and the children themselves. The design goals are to provide a sense of independence for the students, support the child in a place of safety, and enable the educators.

DESIGNING FOR SPECIAL EDUCATION



▲ Open connections between spaces give the school a community feel, with definition between spaces indicated by tactile flooring transitions.

Photo by Andrew Lee

▼ The curved form of Hazelwood School is enhanced by wayfinding elements, including tactile indicators in the flooring and a “trail rail” embedded in a cork wall in the main corridor.

Photo by Andrew Lee



On site, the school steps and curves around existing beech trees to create a sequence of safe, landscaped teaching gardens. The curved design avoids an institutional feel and incorporates visual, sound, and tactile clues. Ease of navigation and orientation through the building is facilitated by a trail rail in the main corridor. The trail rail wall doubles as a storage wall, which is clad in cork to provide warmth, tactile qualities, and signifiers along the route to confirm the children’s location within the school. These aids allow children to move around the school with a greater level of freedom and independence.

DESIGNING FOR SPECIAL EDUCATION



Clerestory glazing allows daylight to penetrate deep into the north-facing classrooms, ensuring even distribution of light. Tall storage boxes below the high glass reduce external visual distraction, which is highlighted by teaching staff as a significant cause of loss of concentration levels in some visually impaired students. This supportive physical environment helps young people with severe and complex needs to manage behavioral issues caused by boredom, anxiety, and confusion exacerbated by more institutional environments. The response from teachers, educators, clinicians, support staff, parents, and the students confirms the positive impact of Hazelwood School's design.

Learning spaces receive abundant natural light from high windows, without distractions at eye level.
Photo by Andrew Lee



Sunfield Residential School consists of multiple buildings on a 58-acre wooded site in the Worcestershire countryside.

Map Data: ©2018 Google.

SUNFIELD CHILDREN'S HOME & SPECIAL SCHOOL

CLENT GROVE, UK

GA ARCHITECTS / GLAZZARD ARCHITECTS

Sunfield is an independent residential special school in a wooded setting in England, originally founded in the 1930s. It supports students aged 6-19 years old with severe and complex learning needs, including Autism Spectrum Disorder. Learning and care activities are provided by an onsite Psychology and Therapies Team offering a variety of therapies including occupational, music, play, speech and language, and sensory integration therapy. There are 75 teaching staff, 56 special needs support staff, and 232 residential care staff.



GA Architects designed a residential unit, completed in 2012, that houses 12 students with profound ASD. Glazzard Architects extended teaching and therapy spaces, and added a new classroom wing.

Classrooms have custom furniture and interactive whiteboards, and smaller rooms serve students who need more individualized approaches. There are designated rooms for cooking, arts, games, and a theater. There are also a soft play and light therapy room, sensory integration suite and sensory rooms, and a therapy pool.

The Sunfield campus includes outdoor facilities with nature trails, an adventure playground, outdoor sensory play equipment, trampolines, and outdoor sensory areas with calm spaces. Sunfield has a farm and horticultural facilities used for activities with the students. A fleet of vehicles allows students to enjoy a wide range of appropriate community based leisure activities, such as shopping, cinema, bowling, and swimming.



CONCLUSION

We are happy to share our knowledge and experience in designing for the benefit of special needs students, and hope this guide helps those embarking on a project for special education to identify many of the particular aspects of creating great learning environments for these deserving children. While every project is unique, please note that we have discussed general principles that come up time and again in creating these spaces. The location, student population, staff expertise, parent community, and funding model will all influence the best final solution in each case.

If you have any comments or questions, or would like to discuss a particular school project, please feel free to contact us as noted in the next section:

[About the Authors.](#)



SOURCES

MEET OUR EXPERTS & SOURCES





SOURCES

ABOUT THE AUTHORS

NAC Architecture is committed to a deep understanding of the environments we design, particularly from the perspective of the buildings' users. For special education, these include the students, teachers, administrators, and parents who form a supportive community.

To develop this level of understanding, we pair our architectural experience and knowledge base with current research into how users experience buildings. NAC's Research and Experience Development Department is not staffed with architects, but rather with dedicated researchers who curate in-depth resources to support our design efforts. Philip Riedel represents the experienced architect behind this digital book; Alyson Mahoe is the researcher who brought together the sources on which it is based.



PHILIP RIEDEL

**AIA, ALEP, LEED AP, PRINCIPAL
PK-12 SECTOR LEADER**

Philip Riedel is a registered architect in Washington and Texas. He has dedicated his career to the thoughtful design of educational environments, including a variety of schools that serve students with special needs. He uses education research, classroom observation, faculty discussions, and building science to develop environments that promote active learning and meet the needs of the whole child. Philip is the Past President of the Association for Learning Environments, Pacific Northwest Region.



ALYSON MAHOE

**RESEARCH & EXPERIENCE
DEVELOPMENT DEPARTMENT**

As a member of NAC's Research & Experience Development team, Alyson Mahoe conducts in-depth research to expand the firm's knowledge and close the gap between designers and end users. She frequently collaborates with design teams to incorporate a deeper understanding of policy, best practices, user research, and innovative thinking into NAC's projects.



INTERVIEWS

Special thanks to the following experts for contributing their time and thoughts to this work:

Laura Shrestha, Sensory Integration Design Consultant
Worcester, Massachusetts

Laura's research has focused on impacts of all senses in designing for special education learning environments, both indoor and outdoor. She advocates for managing sensory overload and accommodating self-calming techniques. She was mentored by Dr. Temple Grandin and Dr. Dak Kopec, as well as others affected by these conditions, and has consulted in renovating special education and therapy spaces in multiple schools. Her designs facilitate the work of educators and therapists, and optimize spaces for students with sensory issues. She considers a wide range of factors, including acoustics, materials, color, lighting, tactility, maintainability, flexibility, hallway widths, and ceiling heights. She has consulted on specific spaces for sensory modulation, de-escalation, and gross motor work.

Pam Guio, Innovative Learning Coach
Northwest Suburban Special Education Organization (NSSEO), Mt. Prospect, IL

All of the goals that educators have for general education students, Pam applies to special education students: next-gen learning, flexibility, places for quiet, etc. NSSEO has shown that special needs students in "active classrooms" achieve higher percentages of on-task time, more student learning points, and fewer removals than those in traditional classroom settings. Pam advocates for flexible and adjustable furniture options to accommodate a variety of needs among students throughout the day. She notes that not every student knows how to use mobile furniture, so instruction is required, and that a few students need static chairs.



Susan Newhall, Physical Therapist
Santa Fe Public Schools, New Mexico

Susan is a longtime special educator and physical therapist for public schools, and provided specific information about room access, spatial requirements, storage, material choices, and finishes. For students learning to walk in walkers, adequate space is essential, and surfaces must be flush and as smooth as possible to minimize friction. Resilient flooring or polished concrete are good options. Minimize all sloped surfaces and transitions between flooring materials. Provide more than one room to service multiple students at a time, with large hooks on the wall for storage and a swing centered 6 feet away from any wall—ideally providing a 1-foot grid of support points for swings, and ensuring the fall zone from swings does not conflict with stored equipment. Provide ample ceiling heights for climbing equipment. Outside, provide accessible playgrounds with rubberized ground tiles, because wood chips and other loose materials do not accommodate walkers. Provide indoor play spaces for movement as well.

Lauren Coble, OTR/L Occupational Therapist
Santa Fe Public Schools, New Mexico

Lauren is an occupational therapist for a public school district, and provided specific recommendations to support her work. Natural lighting is beneficial, but provide window shades and dimmer switches at electric lights. Operable windows are helpful for students with indoor air quality sensitivities. Provide accessible sinks in OT/PT rooms. Storage should have doors, because open shelving is often distracting. Keep wall finishes in pale colors and casework in a similar color, for low-contrast visual environments. Child-sized furniture is required for all ages served by a room, and temperature control needs to be specific to each room.



ANNOTATED BIBLIOGRAPHY

Dr. Owen, C. (2016). *Design Across the Spectrum*. School of Architecture & Design, University of Tasmania, Australia.

These design guidelines have been developed through an extensive review of the literature on autism and design, and through consultation with autism and education specialists. While the guidelines focus on the needs of ASD, their intent is to provide inclusive design strategies for all children across a broad spectrum of diversity. Specifically, the guidelines have been developed for the design of playgrounds in a mainstream primary school setting, although many of the principles could be adapted to another context, such as autism specific schools, public playgrounds, and for children of different ages.

Ulrike Altenmüller-Lewis (2017) Designing Schools for Students on the Spectrum, *The Design Journal*, 20:sup1, S2215-S2229, DOI: 10.1080/14606925.2017.1352738

According to estimates from the U.S. Centers for Disease Control and Prevention's Autism and Developmental Disabilities Monitoring (ADDM) Network, in 2012 about 1 in 68 children had been identified with autism spectrum disorder (ASD). This rapid rise in diagnosed children can be attributed to a better awareness and thus more frequent diagnosis of ASD. However, it also means that as a society, we must better understand and appropriately consider the needs of people with ASD, needs that may vary widely. A broadening of the requirements and attributes of inclusive design is necessary. This paper is an introduction to the challenges in designing learning environments for school-aged children with ASD. While people at every age suffer from autism, supporting children on the spectrum and helping them to develop to their highest potential should be a priority for our society.



Paron-Wildes, A. (2005). Sensory Stimulation and Autistic Children. *Implications: A Newsletter* by InformeDesign.

Neurological changes or deficiencies can notably change how individuals perceive and interact with their environments. Designers must now learn to create environments for people with neurological disorders that will support individuals' success, productivity, and health. It is impossible to change all environments to accommodate the growing number of children with neurological disorders. However, reducing sensory stimuli in areas where learning or important functions occur can help children master necessary skills in a controlled environment.

American Federation of Teachers, W. D. (2009). *The Medically Fragile Child: Caring for Children with Special Healthcare Needs in a School Setting*. [Brochure]. Washington, DC: N.P.

This third edition sets out to accomplish three goals: educate our members on their roles and responsibilities in relation to children with special health care needs; educate our members on their rights as school employees; and outline possible solutions and protections for local unions to pursue on behalf of their members.

McAllister, K., & Sloan, S. (2016). Designed by the Pupils, for the Pupils: An Autism-Friendly School. *British Journal of Special Education*, 43(4), pp. 330-357.

There is growing interest in promoting autism-friendly environments, especially in a school setting. Findings to date have generally advocated an accepted reductionist or generalist approach, and previous studies, while very well intentioned, have rarely involved those with autism spectrum condition (ASC) to instruct designers. To be truly inclusive, the authors contend that those who are most knowledgeable about ASC—those with ASC—should, whenever possible, be given the opportunity to comment on the design of our shared built environment. Hence, this article first introduces some of the challenges faced by those with ASC in trying to cope with their surroundings, before proceeding to outline the development of a simple school design 'jigsaw' kit that helped



pupils with ASC to communicate ideas for their perfect school. Seven considerations were identified as being important to the pupils: playground provisions; a sense of security; noise and comfort; internal circulation spaces; legibility; their own ASC Resource base; and the wider school environment.

Lehr, D. & Greene, J. (2002). Educating Students with Complex Health Care Needs in Public Schools: The Intersection of Healthcare Educations, and the Law. *Journal of Health Care Law and Policy*, 5(1), p. 68.

This issue discusses the considerations that educational program planning must make for “medically fragile” students, so their healthcare needs integrate with their educational needs. Critical aspects of planning for successful comprehensive programs for students with complex healthcare needs include: careful development of health care plans; delineated roles and responsibilities of key personnel; access to information and training for members of the school community; consideration of attitudes toward students with complex health care needs; and educational plans based on the unique instructional and supportive services needs of the students.

Kuntzler, P. M. (2013). The Key To Unlocking An Inclusive Learning Environment Is Community. *Exceptional Parent*, 43(9), pp. 55-57.

Every district, state, and country has the responsibility to respect its wide spectrum of students. Every child and young adult deserves the best education and support possible. The majority of our nation’s school districts are not currently equipped or prepared to serve children who are severely medically fragile. However, specialized schools, like Henry Viscardi, are often criticized for segregation. Henry Viscardi School has the ability to adapt learning experiences to suite each child’s individual needs. Highly specialized schools give students the best education possible and support them medically. Viscardi staff labor to take children to higher levels of achievement. This is done by providing them with effective communication and ambulatory (mobility) systems, engaging recreational options, and assisting their development of social relationships within a preschool-12th grade educational program.



Spaulding, L. S. (2009). Best Practices and Interventions in Special Education: How Do We Know What Works? *TEACHING Exceptional Children Plus*, 5(3).

The critical issue in special education today is no longer the assurance of access, but rather, the assurance of effectiveness. Determining which practices and interventions are most effective and efficient for ensuring optimal student achievement is a fundamental concern of special education teachers in this era of accountability. Individualization is the centerpiece of special education, and despite federal and state efforts to standardize teaching, the special education teacher is ultimately responsible for employing best practices to build on students' current levels of performance and support their social, emotional, behavioral, and intellectual needs.

Abend, A. (2001). Planning and Designing for Students with Disabilities. *National Clearinghouse for Educational Facilities*. National Institute of Building Sciences.

To meet the challenges of educating these students, school designers must go beyond providing barrier-free buildings to embrace a broader concept of accessibility that provides students with disabilities the maximum possible access to general education.

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