Rhode Island Child Care &
Early Learning Facilities Fund

Resource Guide 2

LISC RICCELFF

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"The design of a center can either promote or discourage contact between child and caregiver. It can create a pleasant work environment that eases the task of caregiving and makes caregivers want to stay on, or it can add to staff burdens, burnout, and turnover."

Quoted from Anita Olds, Child Care Design Guide

Introduction

Whether you are constructing a brand new child care center or renovating your existing site, it can be an exciting and challenging experience. A well-planned physical environment will support the implementation of a high-quality program for young children in many ways; therefore, it is critical that you spend ample time, devote sufficient resources, and give careful thought to the design of your new space. This guide will help you better understand and navigate the many considerations that are part of creating a great environment for young children.

The guidelines presented here apply to all types of child care (center-based, family child care, back-up, drop-in, etc.) but have been developed primarily for child care centers serving infants through preschoolers. The concepts described reflect best practices in the early care and education field and are intended to encourage you to think more about the vital connection between quality space and quality programming.

We recommend that any organization pursuing a building project, whether large or small, secure the services of an architect registered in your state, with experience in designing spaces for young children. Your project architect should be closely involved in the planning of your building from the very beginning and can assist you as you navigate all of the many variables and regulations related to designing a quality space. They can also assist you in securing the services of other qualified consultants such as civil, structural, mechanical, plumbing, and electrical engineers, as well as landscape designers.

Although the codes and regulations governing the construction of child care facilities are not the main focus of this guide, we strongly recommend that you become familiar with all applicable licensing and regulatory standards early on in the design process. Your architect can work with you to ensure that your facility is fully in compliance with all relevant requirements, which supercede any recommendations in this guide. The specific codes and regulations that apply to your project will vary greatly from state to state, but in most areas of the country child care licensing regulations, building codes, fire safety codes, and zoning regulations will all play a major role in the design and location of your center.

WORKING WITH AN ARCHITECT

Successfully creating a quality child care environment depends on several things: your architect's skill, your abilities as a client, and the relationship you forge together. The working relationship you have with your architect will be as important as the formal steps in the design process. Here are some key pointers for how to build a good client-architect relationship:

- **Be the program expert.** Your architect's job is to help you realize your vision, not his or hers. The architect should be an expert in what it takes to make a structure stand, how to meet building codes, and how to translate your program needs into a physical design. You are the expert about your program and the type of space it needs to function most effectively. In order for your architect to translate your needs into drawings you must be able to clearly describe how you want your program to function, how many children and what ages you want to serve, what additional services you will offer, etc.

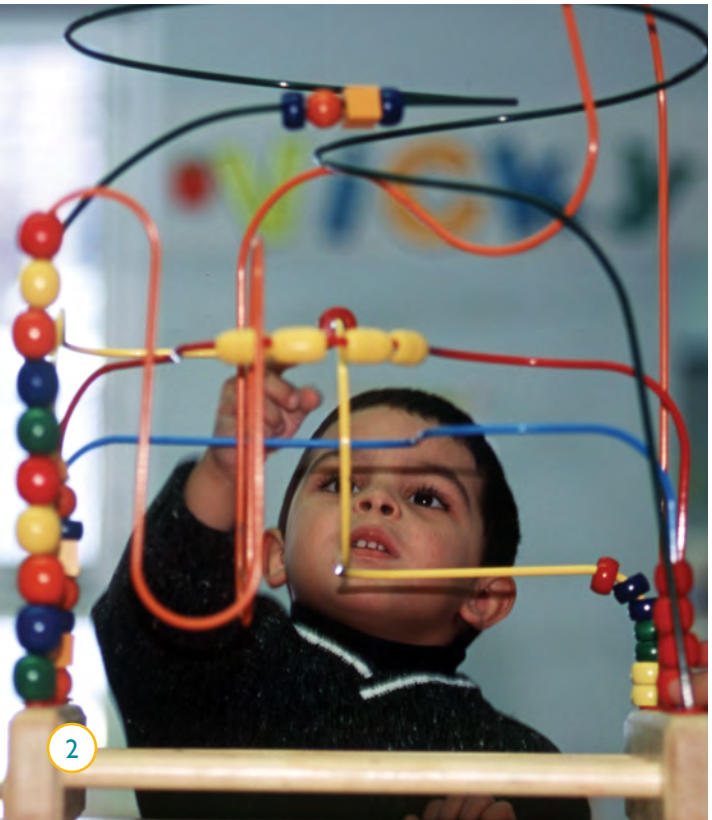
- **Be up to date on best practices.** Whether you are undertaking a renovation or major new construction project, you are creating a space for your program that you hope will last for many years. Make

sure that you are able to articulate all of the latest trends in high-quality early childhood education to ensure that your facility will stand the test of time.

- **Learn together.** At the start of the project, visit child care centers together and discuss what each of you likes and dislikes about them. Help your architect understand the needs of young children and their caregivers and the concerns of parents.

- **Be candid.** Don't worry about the architect's feelings. Let him or her know when you don't like a design idea or when you don't think an idea will work well for your program.

- **Demand good performance.** If you feel that what you say is ignored or that your ideas are being dismissed, it may be time to get a new architect. If the firm is too busy to give your project the time and attention it deserves, you should find an architect who can. If any of these things happen and you cannot resolve your differences, you need to let the firm know that these issues must be addressed or they will be replaced.



A successful building takes both a skilled architect *and* a motivated and strong-willed client with a clear vision for the project. Please refer to Volume 1 of this guide series for more information on how to identify and hire the right architect.

THE FIVE PHASES OF THE DESIGN PROCESS

For major facility construction or renovation projects, there are five formal steps in the architectural design process. Your contract with the architect should refer to these phases:

1) **Space program and site analysis.** Even before you have a site, an architect can help you clarify your facility goals and objectives by determining how much and what type of space you will need, and by developing a rough cost estimate for your project. Once you have a potential site in mind, the architect can help you decide whether this site will meet your needs – for example, is it large enough to support the number of children you plan to serve? Are there any environmental or structural issues that may increase your costs? *The cost of this phase is about 5% of the total architectural fee.*

2) **Schematic design.** Once you have selected a site, the architect will produce a series of rough sketches or plans to show how your needs might be met on the site – for example, how large the building will be, where classrooms and bathrooms will be located, and where the outdoor play area will be. *The cost of this phase is about 10% of the total architectural fee.*

3) **Design development.** Once you have agreed to a rough schematic design for your project, the architect will refine these ideas, adding more detail to every element of the building – including the electrical system, the heating and cooling systems, and the type of materials that will be used during construction. *The cost of this phase is about 10-20% of the total architectural fee.*

The first step in the design process is to establish your goals.

4) **Construction and bidding documents.** The most time-consuming phase for the architect is preparing the detailed drawings the contractor will use to estimate the cost of the project and prepare a bid to carry out the work. These construction drawings will include details on how the building will be constructed and what materials and finishes will be used. During this phase, the architect will also prepare the bid package sent out to potential contractors, and will help you select and enter into an agreement with one of the candidates. *The cost of this phase is about 40-50% of the total architectural fee.*

5) **Construction administration.** During the construction process, the architect can ensure that the building is being constructed or renovated as he or she specified in the construction drawings. The architect reviews the contractor's request for payments and makes sure that disbursements are consistent with the contractor's progress. *The cost of this phase is about 25% of the total architectural fee.*

Architectural fees on a large child care facility project are typically in the range of 7% to 15% of the total project cost. The actual costs will vary depending on the scope and specifics of your project. For example, if the total budget for your facility is $1 million, you could expect to pay between $70,000 to $150,000 in total architectural fees.

DEFINING YOUR SPACE NEEDS

The first step in the design process is to establish your goals for the new or renovated center. While this may not seem as exciting as the design process itself, it is a critical step that will help to ensure the final product fully meets your needs. Some of your goals will be more conceptual – such as how you want the center to feel. Other goals will be very specific, including the number of children you will serve and the type of activities that will take place.

A good architect will be able to translate your program needs into square feet and other specific physical characteristics that will help you find the most appropriate site and guide the overall design of the center. This physical description of your needs is generally referred to as a "space program," "architectural program," or "design program."

Professionals in the child care field have often had to make do with less than perfect space in which to run programs. The development of the space program is your opportunity to think big and begin to create a space that will be ideal for operating a very high quality child care program. Try to think beyond what you currently have or even what you have seen at other centers, and focus on what would be ideal for your program.

TOUR YOUR EXISTING CENTER WITH A CRITICAL EYE

If you are currently operating a child care center, the first step in developing a space program is to have your architect visit the center to understand how you use it, and to determine what you like and don't like about it. Because of his or her architectural training and experience, your architect should ask questions that may never have occurred to you, such as, "I notice there is no reception area. How do you handle visitors or deliveries?" These questions may help you think about how different functions and activities occur and what changes you might want to make to have a more effective environment in your new facility.

VISIT OTHER CHILD CARE SPACES

A next logical step would be to visit other child care centers that are known for having a good facility. If you are not familiar with facilities in your area, the state child care licensing agency may be able to help you identify newly constructed facilities and high-quality spaces to visit. In states where LISC and others operate child care facilities funds, staff there can help arrange for these types of visits. When visiting other centers, pay careful attention to design features that appeal to you. If you have the opportunity, interview staff there about what works especially well and what does not work in the space.

INTERVIEW EVERYONE WHO WILL USE THE SPACE

A common mistake in designing child care space is not gathering sufficient input from all of the people who will use the facility. The primary users of the space are the children, parents, teachers, support staff, and administrators. Each of these groups of individuals will have very different needs. For example, teachers may be most interested in things like easily cleaned surfaces, accessible storage, and good acoustics, while administrators may focus more on the ease of supervision, aesthetics, and welcoming common areas. Parents may be most concerned with ease of drop-off and center security, while children could provide a range of creative ideas for the kind of space they would like to spend their days in. Find opportunities to gather and record feedback from all of these groups and to work with the architect to ensure that the priorities of each group are incorporated into the overall center design.

THINK ABOUT YOUR OVERALL GOALS FOR THE CENTER

An important part of the space planning process is being able to articulate the overall goals for your center in terms of its functionality and design. This means describing things such as how you want the center to feel and function, and articulating the type of atmosphere you hope to create. Is it important that the aesthetics of the center blend well with the community surroundings? What does the overall design tell parents and visitors about your program? These are all important questions to consider and discuss with your architect.

PLAN FOR THE FUTURE

When considering all of your center's space needs, remember to think and plan ahead. Given that the building you are now planning for may not be complete for two or more years (depending on your project's timeline) you need to consider potential program growth or other future trends that might affect your facility plans. You don't want to be in the unfortunate but all too common situation of having outgrown your space before you even move in.

CAREFULLY DESCRIBE THE SPECIFIC NEEDS OF THE CENTER

After carrying out the information gathering activities described above, you will need to provide your architect with very specific information about your program's needs. At a minimum, the description of your space needs should include the following:

- **Total population of the center.** When thinking about your center's total population you need to consider both the number of children you hope to serve as well as the number of adults who will use the space. Adults will include parents who come and go, staff who work there each day, and other visitors who are expected. It is also important to provide information on the ages and any other special characteristics of children to be served.
- **Groupings of children.** Give careful consideration to how children will be grouped into physical spaces. You will need to provide your architect with information about how many children and of which ages will be placed into distinct spaces as well as which spaces should be adjacent to one another. For example, you might provide your architect with the type of chart below.
- **Classroom square footage needs.** Generally the number of square feet per child of classroom space required by state licensing standards does not provide you with sufficient space for a high-quality program. A general rule of thumb is to allow for at least 50 square feet of usable classroom space per child for preschool-age children and even more for infants and

The chart below is provided for representational purposes only. Your numbers and groups may vary greatly depending on program goals and local regulations.

AGE OF CHILDREN	NUMBER OF CHILDREN AND ADULTS IN EACH CLASSROOM	TOTAL NUMBER OF CLASSROOMS FOR THIS AGE GROUP	SPECIAL NOTES
NONMOBILE INFANTS (6 WEEKS – 1 YEAR)	6 children 2 teachers	1	Adjacent to mobile infant room. Make sure to provide enough room for a distinct sleeping area where cots can be 3 feet apart and still allow enough space for eating and activity areas.
MOBILE INFANTS (1 YEAR – 18 MONTHS)	8 children 2 teachers	1	Adjacent to other infant room and in same area of building as toddlers.
TODDLERS (18 MONTHS – 2.9 YEARS)	10 children 2 teachers	2	Need more than the minimum required toilets for this age group.
PRESCHOOL (2.9 YEARS – 4 YEARS)	16 children 2 teachers	2	Preschool classrooms should be adjacent to each other.
OLDER PRESCHOOL (4-5 YEARS)	18 children 2 teachers	1	In same area of building as preschool classrooms.

Plan for more than the minimum required square footage.

toddlers. Make sure that your architect understands the difference between your gross square feet and usable square feet needs. When the room is measured for licensing purposes, many things are likely to be subtracted from your totals, such as the floor area occupied by cubbies, changing areas, storage units, sinks, and other bulky items. Planning for more than the required square footage will help ensure that you end up with the amount of space you need.

- **Classroom characteristics.** In addition to thinking about the number of children who will be served in each classroom, you also need to specify the types of features you would like to have in each classroom, including:

  - Children's bathrooms, where they are located, important characteristics, etc.
  - Changing areas
  - Windows
  - Access to outdoors
  - Types of flooring
  - Types of lighting
  - Built-in features, such as counters, cabinetry for storage, etc.

- **Staff needs.** A description of staff needs might include things such as secured storage for personal belongings, phones and intercoms in rooms, work areas in classrooms, convenient storage for classroom supplies and materials, staff break and resource rooms, and more.

- **Number and types of offices.** Make sure to carefully plan for the number of staff who need private office space. When providing this information to your architect, be specific about the types of activities that will take place in different offices. For example, do you need room for both a desk area and a small meeting area in the director's office? Should offices be equipped for the Internet and telephones? If any staff members will be sharing an office, will multiple phone and computer wires be needed? Finally, figure out how much space is needed for files and other information within the office area(s).

- **Adult and support spaces.** Think about all of the different types of spaces you would like to provide for adults using your center. Hopefully, these are likely to include adult bathrooms, staff break and resource rooms, a meeting room, and

dedicated parent spaces such as a resource area. After you have listed the spaces you want to include, provide information about how these rooms will be used, including how many people are likely to be in a space at one time, which spaces can be shared, which spaces should or could be adjacent to one another, and what types of furnishings each room will require.

- **Kitchen.** Almost every center will have some type of kitchen space. Decide early on in the process how you plan to use the kitchen, and be sure to communicate this to your architect. For example, will you prepare meals at the center? Will you use the kitchen only to warm or hold food delivered by a caterer? Will all the children bring their own food from home? Do you want to be able to use the kitchen for cooking projects with the children? The answers to these questions will help your architect plan the kitchen so that it meets your needs and complies with all relevant codes.

- **Indoor gross motor and/or multipurpose space.** It is ideal in almost every climate to have opportunities for gross motor activities indoors. Spaces may be designed to double as gross motor spaces during the day and meeting spaces in the evening. Some centers with limited space also use dedicated school-age child care space for indoor gross motor space "off-hours." When the space is designed to have multiple uses, it is important to include adequate storage to house the bulky gross motor equipment, tables, chairs, etc. that will be needed to make the room function well for each use. Regardless of how your program decides to use this space, it is important that you think about it in advance and provide your architect with the information to plan appropriately.

- **Storage.** You would be hard-pressed to find any child care center that has enough space for storage. Planning for all of the many storage needs up front will add greatly to your satisfaction with the center when it is complete. A few of the storage areas to think about include:

  - In-classroom storage for items that teachers need close by for easy access
  - Large bulk storage areas for supplies bought in large quantities and seasonal items
  - Kitchen storage
  - Storage near the reception area for car seats, strollers, etc.
  - Secure storage for cleaning supplies and other hazardous materials

How will you connect the classrooms with the outdoors?

- **Entry and reception.** There are several things your architect will need to know about how you want to handle entry at the center. These include:
  - **Security.** Will you use an automated security system or will a staff person be stationed near the door?
  - **Reception.** If a person is stationed at the door, what type of work area will be needed?
  - **Use by families and visitors.** Do you want to provide a comfortable place for people to sit and wait?
  - **Deliveries and maintenance.** Will you need a separate entrance to handle deliveries and service calls?

- **Adjacencies.** If you want to have certain spaces next to each other, you should communicate these preferences to your architect early on in the design process. For example, do you want the director's office near the entry or near the classrooms? Do you want the meeting rooms near the adult bathrooms? Do you want the staff room close to or far away from classrooms?

- **Laundry, maintenance, and mechanicals.** Don't forget to plan for enough space in appropriate locations for important functional areas including laundry facilities, a janitorial closet, and a mechanical room.

- **Outdoor areas.** Give careful thought to the areas outside your building as well as inside:
  - **Parking.** What are your short- and long-term parking needs?
  - **Entry.** How can you use landscaping and other design features to ensure that your entry welcomes children, parents, and visitors to your center?
  - **Connecting indoors and outdoors.** How do you want to connect the classrooms with the outdoors—the outdoor play space in particular?
  - **Playground.** Think about how much square footage you will need to accommodate the number of children in your center. Licensing regulations generally dictate the required square footage for outdoor playgrounds, but you may choose to plan for a larger space than what is minimally required. Also, allow for any built-in features that you might want in your playground (such as covered areas, access to water, or easy access to child bathrooms).

Depending on the program you are planning for, there may be many other things that you need to clearly articulate to your architect at this stage. For example, if you expect to serve any children with special needs on a regular basis, you may need additional space for physical or occupational therapy, or to accommodate specialized furnishings and equipment.

Based on site visits, interviews, research, and the information that you provide, the architect will produce a report that describes the center's physical space requirements, including:

- The **type of program** it will house
- The **number of children** it will serve
- The **amount of square feet needed** for each room inside the building as well as outdoors for the playground, parking, etc.

NOTE: A sample space program is provided in the Appendix at the back of this guide.

To determine your total square footage needs, the architect will calculate the amount of space needed for each room, including classrooms, multipurpose rooms, administrative offices, kitchens, etc. The total square footage required for all of these rooms will be increased by 20-30% to account for space taken up by hallways and walls. Once the architect knows the building space requirements, he or she will determine the overall site square footage requirements, taking into consideration the amount of space you need for parking, playground, and other outdoor activities.

Managing Construction Costs

The process of undertaking a building renovation or construction of a new building is a multiphase process with a somewhat unpredictable format for identifying costs. Unlike the purchase of furniture or equipment where the cost is clearly identified at the outset, the costs for construction are more variable due to construction activity in various regions and material availability. The following is a summary of a recommended process for development and management of the project costs through the design and construction phases.

PREDESIGN PHASE

For this initial phase, the child care center management needs to clearly identify the proposed scope of work that is needed and/or desired and should prioritize the work items in case the scope of work needs to be adjusted to meet the budget. At the outset, it is likely that you will not have a sense of the costs for various construction elements or if desired renovations for a particular area may impact other spaces. However, this prioritized list of work items will be a helpful resource for the design professionals that will assist you with the project. For more detailed information on facility development planning, refer to the "Rhode Island Child Care Facilities Fund Resource Guide #1 – Child Care Center Facilities Development & Financing."

DESIGN PHASES

During the design phases of the project, it is helpful to have cost estimate information at a level that is commensurate with the level of definition of the design and updated as the design evolves. At the earliest phase of design (concept design), architects with experience with this building type can provide rough construction cost information in the format of cost per square foot based on experience with other child care centers of similar scope.

For the subsequent two design phases (design development and construction documents), however, it is valuable to have a cost estimate with a breakdown of the project costs by specific work type in order to be able to confirm and evaluate the costs at a more detailed level. There are three main approaches for obtaining cost estimates:

- **Professional Cost Estimators.** This format for construction cost estimates is the preferred approach for obtaining independent cost information. Professional cost estimators focus solely on construction costs and have extensive data base resources. Despite their expertise, there can still be discrepancies between the estimates and the actual bids from contractors due to frequent fluctuations in construction costs.

- **Contractors.** Not Bidding on Project: This option for cost estimates can be a more cost-effective option to a professional cost estimator but it is important to retain a contractor that does regularly provide cost estimates with the recommended level of detail and has extensive experience in the region and of the early education building type.

- **Contractors.** Bidding on Project: Contractors will often provide cost estimates for a small fee or no cost in order to position their construction firm for selection as the general contractor. This option is not recommended because of the inherent incentive to provide a low-cost estimate that may not fully reflect construction costs.

ALTERNATES

Given the unpredictability of construction costs, it is valuable to include several construction scope items that are desired, but not essential, to the center design as alternate scope items in order to adjust the scope of work based on the cost per the contractor bids. The alternate scope items should be discrete elements that can be added without impacting the overall design/

construction of other elements. Examples of alternate scope items include interior finishes such as an alternate flooring material or the addition of wood wall paneling on the lower portion of the classroom walls, discrete millwork items such as the reception desk which could be a custom desk or purchased desk, or a special element such as a ball/chute magnetic wall that could be added in the multipurpose room. The alternate scope items are best configured as additions to the base scope of work. Keep in mind that larger scope alternates may be appropriate to provide scope choices at a cost scale large enough to compensate for bidding variations.

DESIGN AND CONSTRUCTION CONTINGENCIES – NEW CONSTRUCTION VS. RENOVATION

Invariably, there will be unforeseen costs during the construction and it is important to have cost contingencies from the outset of the project through construction. The contingency amount should be highest at the beginning of the project when there are the most unknowns, gradually reduced as the scope of work is better defined during the design process, and then reduced to nothing at the end of construction. Recommended contingencies in the schematic design phase are in the range of 30% of the total project budget and can be reduced through the course of the project to 10% at the construction phase. For renovation projects, the contingency amounts should be higher (approximately 5% more than for new construction), since they typically have more unknowns that are uncovered during construction.

General Design Principles

PLAN FOR ENOUGH SPACE

The importance of providing more than the minimum square footage required in classrooms has been discussed previously. Children spend many hours of the day in their classrooms, and often have meals and snacks there, as well as naps. Providing ample space in the classrooms allows you to create more and better activity areas with appropriate equipment and supplies and a greater variety of options for children.

You also need to consider the total square footage needs of the entire facility. It is a very common mistake to underestimate the amount of nonclassroom space that will be needed in a well-functioning, high-quality center.

Depending on the services provided by your center, space requirements in addition to your desired classrooms may include:

- Entry/reception
- Parent and/or staff resource rooms
- Administrative offices
- Meeting spaces
- Indoor gross motor room
- Kitchen
- Health office/sick child area
- Laundry room
- Adult bathrooms
- Storage spaces

In addition to these types of program spaces, it is important to consider building support spaces, including:

- Mechanical rooms
- Electrical rooms
- Janitor's closet
- IT/Server Room

Finally, do not forget that walls and hallways take up space too, and will reduce the total usable square footage available in the center. Well-designed child care centers typically have approximately 100 square feet per child of space in the overall center. So for example, a center proposing to serve 80 children would be likely to need a building that has about 8,000 square feet of total space available. It is important to note that this is just a guideline. Many centers have substantially more square feet per child if they provide many other services and amenities onsite, and some centers do manage to effectively function with less total square footage as well.

DESIGN THE SPACE FOR ALL OF ITS USERS

- **Scale things for children.** Equip your center with furnishings and features that increase children's independence and competence. From the initial point of entry, and throughout the center, furnishings and fixtures should be appropriately scaled to children's height and appeal to their interests – from a low counter in the reception area to child-sized sinks and toilets and low shelves in the classrooms with a variety of educational materials that the children can access and use on their own. All of these considerations will help to support the implementation of a very high quality program.

- **Support teacher and staff effectiveness.** Design child care centers to support and ease the work of caregivers. Staff need adult-height classroom work surfaces and sinks, storage, phones, and seating, as well as areas where they can comfortably meet, relax, or do work away from the children. Make sure to spend time talking to center staff about their specific space needs and preferences.

- **Consider the needs of parents.** The center should be designed to let parents know that they are welcome and to make the space as convenient as possible to use. This might include things such as a convenient and welcoming entry, a parent resource room, a quiet seating area to spend time with a child before transitioning into the classroom, private places to meet with staff, or storage areas for car seats and strollers.

EXPECT TO PAY MORE FOR QUALITY

Determine a realistic project budget early on in your planning. Whether this budget is feasible will depend on how much funding your organization can raise in grants as well as how large a loan your organization can repay. You will need to strike a balance between not allowing the budget to limit creative design while providing clear guidance to your architect on what your organization can ultimately afford.

It is very expensive to develop high-quality child care space: for one thing, you need a lot of square footage to accommodate all of the different classroom and nonclassroom components of a well-functioning center. Also, a well-designed space will be highly specialized to meet the unique needs of an early childhood program and will include many costly features like sinks and toilets scaled to a child's size; extensive plumbing to locate bathrooms within or directly accessible from the classrooms; built-in counters, changing tables, cabinetry and storage spaces, and lots of exterior and interior windows to help children connect to the world around them. Investing in higher quality and more durable materials will add costs to your project up front, but will help to minimize maintenance and replacement costs for many years to come.

It is always wise to pursue cost-effective design solutions, such as a layout that minimizes the space used for hallways or sharing bathrooms and storage areas between classrooms. However, you should be careful not to try to lower costs by cutting back too much on critical features, such as reducing the amount of square footage or using lower quality, less durable materials in construction.

CREATE AN APPROPRIATE FEEL FOR THE CENTER

After you have outlined all of the different spaces your program will need, and have calculated the square footage required, it is time to give some thought to the overall feel or environment of the new center. While there are many complex operational, safety, budgetary, and regulatory considerations to be aware of, a good design will put all those requirements together in an environment that reflects the program's philosophy and provides a sense of place for children, parents, and caregivers. It is also ideal for the center's design to blend well with the feel of the surrounding community. Be prepared to articulate your goals for the feel of the center early on in the design process.

PAY ATTENTION TO THE USE OF COLOR

Color theory for children's environments varies, but many experts believe that colors should be used with restraint in child care centers. A popular strategy is to use brighter colors in common and public spaces, such as hallways and the reception area, while using more muted colors in classrooms. Within the children's classrooms, color and visual variety are introduced through coats in cubbies, artwork on walls, toys and equipment, innumerable children's projects that occupy the space and change over time, and even the clothes on the children themselves! However, a completely white space (white painted walls, white ceiling, bland floors) feels very institutional and should also be avoided. Ideally a classroom environment will have a color scheme that provides a soothing backdrop to the activities that happen there. This can be achieved by using any number of subtle, warm colors on walls and by including natural features such as natural wood or cork floors, wood furniture and cubbies, and carpeting or tile in neutral shades.

FOCUS ON THE IMPORTANCE OF LIGHT

Vision is usually considered to be the dominant human sense, and light is the source of vision. For developing young children, the quantity, quality, and variety of light will shape their experiences and understanding of the world around them. In the design of child care space, where light comes from and how it is controlled can have a significant impact on the quality of the environment. Classrooms and other activity areas in the center should incorporate a range of natural and artificial light from a variety of sources, and seek to maximize the number of windows between spaces and to the outdoors. Individual classrooms should have the ability to control their own light, ideally with a dimmer switch. Details on lighting sources and strategies can be found on page 37 of this guide.

DON'T FORGET ABOUT ACOUSTICS

Anyone who has spent time in a child care center filled with young children realizes that acoustics are a critical consideration in designing the space. While architects love the dramatic effect of large spaces and high ceilings, these features can result in an overwhelming noise level when filled with groups of children engaged in activities. High ceilings may be appropriate for certain spaces within a center, such as large gross motor rooms, but must be designed to properly address noise levels. It is also important to consider the adjacencies of potentially noisy areas. For example, an infant room would not ideally be located next to an indoor gross motor area and loud mechanical rooms should not be next to children's classrooms. Finally, make sure that if spaces such as bathrooms or changing areas are shared between classrooms, there is a sufficient sound buffer between the classrooms. Details on acoustics can be found on page 44 of this guide.

PLAN FOR INTENSE PLUMBING NEEDS

Be sure to fully consider the intense plumbing needs of a child care center, including children's and adult toilets and sinks. In particular, always make sure that you are planning your design so that children's bathrooms are directly accessible from the classrooms. If you are renovating an existing building, carefully explore the feasibility of adding bathrooms in a variety of locations. If you are constructing a new building, you should seek cost-effective strategies for installing bathrooms, such as sharing them between classrooms. If a public water source and sewer system are not available in your area, make sure that the potential site has or can support a septic system and well that will accommodate the plumbing needs of your program.

CONSIDER RELATIONSHIPS BETWEEN SPACES

How different spaces in a child care center are situated and relate to one another helps children orient themselves in the world and develop a sense of where they are relative to other places.

- **Connecting interior spaces.** Since teachers and children spend much of their day in an individual classroom, it is helpful to provide a visual connection with other interior spaces such as adjacent classrooms or even hallways. Connections between classrooms can be established by placing windows between rooms at both child and adult height. Using doors with windows is another strategy that can be used. Including windows between hallways and classrooms will allow a child to see in before entering, which can ease the transition into the classroom space. These windows can also be used by parents or visitors to observe classroom activities without entering the room. Shared spaces between classrooms such as changing stations, storage areas, children's bathrooms, and food preparation areas—not only can save space and improve efficiency, but can also provide a visual connection between two rooms.

- **Connecting interior to exterior spaces.** It can be very challenging for classroom staff to transition groups of children to the outdoors. Providing direct access from classrooms to playgrounds will ease the process for both children and adults, and maximize the time children have for outdoor exploration and play. Covered outdoor spaces such as porches can help with this transition and also extend the classroom's usable space. These spaces might be used for games on a rainy day or for rocking with an infant out of the sun.

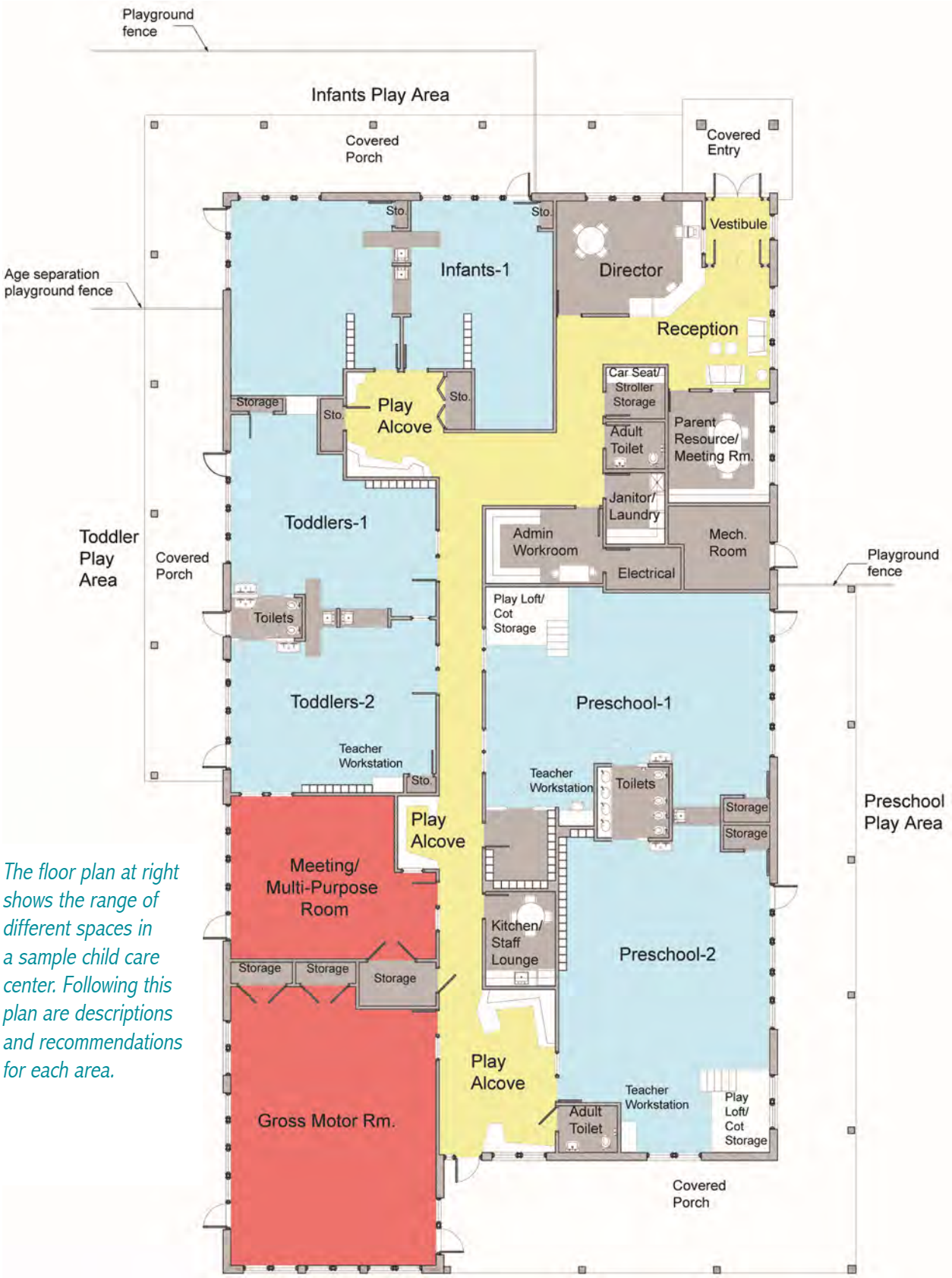
Also consider ways to bring the outdoors inside. This might include a bay window with a window seat that allows a child to sit protected from the elements but still feel as though he or she is part of the outdoors. Consider planting an interesting butterfly garden or putting a bird feeder near a window where children can sit and watch nature change with the seasons. And always make sure to provide plenty of windows at child height so that children can see out during the day. If you are building a new facility, always locate the classrooms around the perimeter of the structure so that all of the classrooms have windows that provide daylight. In older buildings where window heights are already set, consider building a loft or platform so that children can get up to window level. If you are renovating an existing building with large doors that won't be used (as is very common in former commercial and industrial buildings) consider replacing a door with sizeable windows to bring more of the outdoors in.

Provide a visual connection

with other interior spaces

such as adjacent classrooms.

A Walk Through The Center



The floor plan at right shows the range of different spaces in a sample child care center. Following this plan are descriptions and recommendations for each area.

Providing direct access from classrooms to playgrounds will ease the process for both children and adults, and maximize the time children have for outdoor exploration and play.

CAREFULLY DESIGN THE BUILDING ENTRY

The entrance to a child care center can set the tone for the entire facility. Keep in mind that for children and adults, the approach to a child care center can be an exciting as well as frightening event. Even for experienced families, the entrance signals that they will be separating from one another for the day. As a result, the entry should be well thought out and carefully designed. The main entry should be easily identified, with a path to the front door that is clear and accommodating, inviting, and even engaging for kids. For example, a water feature such as a fountain or birdbath can be intriguing to children of all ages. Gardens and front yards can convey an environment that is calm and enjoyable, and act as a comforting buffer from the more hectic world of street traffic. Even in very urban environments, give careful thought to ways that a transition space can be created between the street and the building entrance. This may be as easy as having some planters, a bench, and a welcoming sign.

A covered entryway provides an opportunity for families to stop and transition out of the external elements, into the interior space. This is both a convenience for parents who are often juggling many items along with one or more very young children, and a way to reduce the amount of dirt and moisture that are tracked inside.

A front porch can be a very useful way to achieve this goal. A porch conveys a feeling of welcome, recalling front stoops and porches common in residential buildings. These are common not only in denser urban housing but also in rural dwellings (farmers' porches). At a child care center, a porch can immediately convey that the center

TIP: *Plant a garden right outside a classroom window that can change with the seasons and add interest to children's views.*

is a community place. A front porch will provide ample protection from inclement weather and enough space to manage young children and their various equipment and supplies (strollers, bottle bags, clothes bags, etc.) before entering the center. It also offers a place for families to exchange a good morning with each other or have an informal conversation without blocking traffic during congested drop-off and pick-up hours.

If you are renovating an existing building it may not allow for an elaborate covered outdoor entry such as a full front porch, but nevertheless consider strategies for easing the transition from the outdoors as well as providing places for children to transition and families to interact. This may be as simple as adding a large awning to an existing building and strategically placing some welcoming features near the outside entry.

INTERIOR ENTRY AND RECEPTION

The reception area should continue the welcoming and appealing character of the front entrance and should be designed to ensure that families and visitors entering the space will know immediately what to do next. This may be accomplished through the placement of a receptionist at the entry or in smaller programs by providing adequate signage that directs visitors to a designated location.

There are many different approaches to reception areas and the kinds of functions they support. Even the most simple reception area in a small center should ideally include a workstation for a person who will welcome people to the center and have a comfortable area for parents to sit with their children before they transition to the classroom, or while they wait for a meeting with a teacher or staff person.

Reception areas in larger and more comprehensive centers will often include a broader range of components:

- Sign-in area (often with a digital touch-screen or keyboard).
- Receptionist desk with visual connection to the front door.
- Adequate seating (at least two areas to allow for some privacy).
- Elements that appeal to children, such as an aquarium, art display gallery, views to a gross-motor space or studio, books and toys, etc.
- Visual and physical connection to the director's office, and to a family resource room or area.

FUNCTIONAL REQUIREMENTS OF THE ENTRY AREA:

- **Security.** Ideally, the security of the entry area should be handled both through direct monitoring by a receptionist as well as mechanical devices so that there is overlapping coverage. Commonly used security systems include:

  - A card reader system with entry cards that can be swiped through a machine and configured to allow varying degrees of access to parents and staff.
  - A telephone/intercom for visitors to call the receptionist desk and be buzzed into the center.
  - A touchpad system that provides each family with an individual access code that can be punched in.

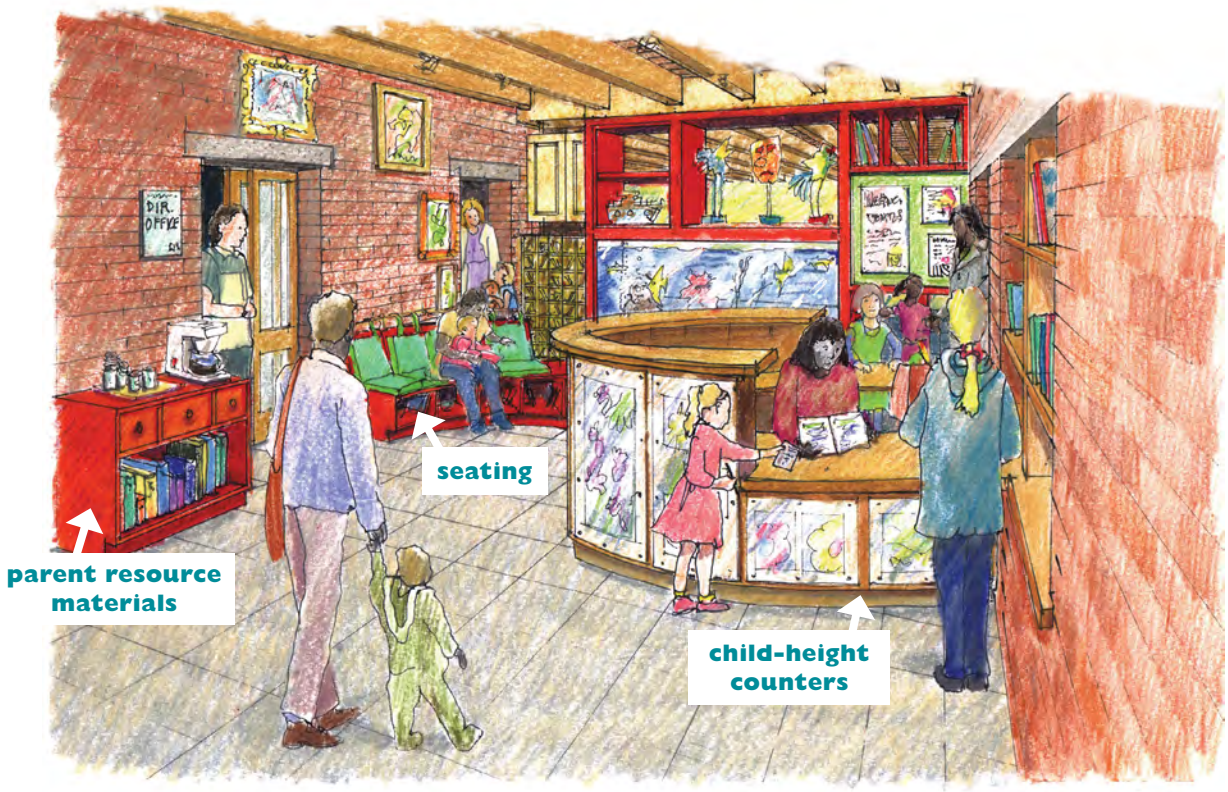
  Any mechanical security system being considered should be coordinated with the project architect to confirm that it does not interfere with required egress from the building during emergencies.

- **Reception desk.** In smaller centers, the director or assistant director often handles the reception duties. In larger centers, there is often a dedicated receptionist. When a receptionist or administrative person can be located right in the reception area, it greatly enhances the friendliness and efficiency of the center. Because the receptionist often has multiple responsibilities, the reception desk needs to be well-designed to support the various activities planned for each center. Typically, the receptionist provides security for the center, monitoring all the people who come and go, so it is important to have a direct view of the entry, including the inside entry doors and the outside entry porch or area. Since the receptionist often performs a lot of other functions, the desk should be equipped with a sufficient number of electrical outlets and telephone and data lines for all of the equipment that will be located there, such as a computer, telephone (main station), fax machine, printer, etc. Some centers also have families manually sign in at the reception desk, which requires an appropriate space for this to occur.

  Despite all of the functional requirements for the reception desk, it can be designed as a whimsical and child-friendly place. In addition to the necessary adult-height counters (about 42 inches high), the desk could also have counters at a child's height (about 18 inches high), so that the children can "sign themselves in" while the parent officially signs in with the receptionist. Materials such as felt or Velcro can be incorporated into the face of the desk and be used with loose felt pieces (shapes, animals, letters, free-form shapes) so that the kids can create and play. The front face of the desk can easily double as a child-size art gallery to display children's artwork at their eye level. This can be achieved by providing small recesses in the desk for sculpture display and removable Plexiglas panels to protect paintings and drawings.

- **Seating area.** To make the reception area welcoming, provide a comfortable waiting area to be used by new families that may be visiting the center, other visitors, and even current parents at the center for spontaneous meetings. The waiting area is also a place where parents can help their children through difficult transitions and separation issues. The space does not need to be large, but should have room for at least two or three comfortable chairs. Also consider incorporating bookshelves and displays into this space so that the waiting area can double as a parent resource area with information on best practices in parenting and other family services in the area.

- **Storage.** Parents often need to leave their car seat or stroller at the center, especially if another parent or caregiver will be picking the child up at the end of the day. This requires a dedicated storage area that is accessible to parents but away from the main flow of traffic in and out of the center. Without an appropriate space allocated for these items, the reception area will quickly become very cluttered and crowded. In addition, there should be a place for visitors to leave their coats and other items while at the center.



CLASSROOM SPACES

DETERMINING SQUARE FOOTAGE

As discussed previously, most early childhood programs find that the state licensing minimums for classroom square footage are not adequate to support the kinds of activities that take place in high-quality child care programs. Most experts agree that at least 50 square feet of usable space should be allotted per child in each classroom, and even more for infant and toddler rooms to accommodate their cribs and other specialized, bulky equipment.

NOTE: Research since the 1970s has consistently recommended between 45 and 54 square feet of activity space per child. In fact, the recommendations have trended upwards over time. Unlike the 35 square foot standard seen in most state licensing regulations, recommendations for these higher amounts come from empirical research.

CLASSROOM CONFIGURATION

Along with providing adequate square footage, there are several general principles to keep in mind when designing classrooms:

- **Strike a balance between structured and flexible space.** Some classrooms are designed to have so much flexibility that they end up looking too institutional. Other classrooms have so many built-in and fixed features that they don't allow for individual teacher preferences and any future adaptations to the space. The key is to find the middle ground between these two extremes. Things to consider include whether cubbies should be built in or free standing; whether there will be distinct carpet and tile areas or reliance on area rugs; whether storage cabinets will be built in or movable; and whether the use of lighting, ceiling heights, and wall textures will enhance or possibly inhibit teacher and child creativity.

- **Consider classroom shape.** Once operational, classrooms will be subdivided into learning areas and other cozy places for small groups of children around the room's edges. Most centers find that it is easiest to subdivide the space in this way when classrooms are more or less square in shape, since this configuration enables you to set up a number of distinct activity areas and learning corners while leaving enough room around these areas for circulation. In contrast, it is very challenging to create a series of learning areas in a very long and narrow classroom.

- **Plan for placement of fixed features.** Carefully think about where to locate fixed features based on how they might influence the activities that occur in the space. For example, if you are including a children's sink in the classroom, you should place it in an area of the room that is likely to be used for messy activities, and away from the entry or carpeted areas.

- **Avoid blind corners.** Supervision is a critical consideration in child care programming, and therefore the design of the classroom should support the ability of teachers to easily see and supervise children from all angles in the room.

CLASSROOM ENTRY

The most efficient and direct way for children and adults to enter their classroom is from a corridor or common area. However, once inside the classroom, it is preferable to have a transition area between the common area and the children's space to provide:

- A place for the children to separate from their family members before joining the group.

- An area to change from outdoor clothes to indoor clothes.

- A place to store children's personal effects such as coats, boots, change of clothes, lunch, a favorite toy, etc.
- A place to post parent notices, schedules, and other important information.
- A place for parents to sign their children in and out.

If space allows, the creation of a small alcove just inside the classroom door, which is distinct from the classroom activity area, provides an ideal transition space for these activities (see illustration above). This interior "mudroom" may be equipped with the cubbies, a place to sit down, parent mailboxes, information display, and a sign-in counter. A low partition with a gate can separate this area physically from the rest of the classroom, but maintain a visual and acoustical connection. It is important to note that although this area is technically inside the classroom it will likely not be counted as "usable square footage" by state licensors.

Additional information regarding cubbies, a critical component of the classroom entry area, is provided on page 7 of the Equipment and Furnishings Guide, Volume 3 in this series.

TEACHER WORK AND PREP STATION

A teacher workstation is an important but often overlooked component of a classroom. Providing a dedicated area for teachers allows them to prepare the day's activities, easily jot down a note to a parent, keep important files on hand, and have a safe area for personal belongings. The area does not have to be large, but should incorporate a 30-inch-high work counter (approximately 4 feet long), lockable file cabinets or base cabinets, and wiring for the classroom telephone or intercom system. Ideally the station will be oriented so that the teacher using it can still observe the classroom. Cabinet storage for teachers' materials is ideally provided above the work counter.

GENERAL CLASSROOM STORAGE

During the design process careful attention should be paid to providing adequate in-classroom storage for things such as classroom supplies and materials, toys that are not currently in use, seasonal items, cots, and maintenance supplies such as cleaners and paper towels. The following is a brief list of storage ideas and things to consider when developing storage solutions in the classrooms:

- **Wall cabinets.** Wall cabinets provide a good storage solution for materials that teachers need to have close at hand. An advantage is that they do not take up valuable floor space. They should be located high enough so as not to interfere with children's activity areas, but need to be readily accessible by teachers. Wall areas above children's cubbies are a good location for wall cabinets or shelving for teacher storage or for parent storage of additional clothing, diapers, etc.
- **Cot storage.** Most child care programs will have a need to store cots for children's rest time in a location that is readily accessible to teachers. Cot storage takes

The typical reach for a 5'-6" tall person is around 6'-0" off the floor. Therefore, it is helpful to have a folding step stool in each classroom in order to make higher wall cabinets or closet shelving readily accessible. A stool can be stored in a base cabinet at the teacher workstation or in walk-in closets to keep it away from children.

up a significant amount of space. Cots that stack horizontally require approximately 8 square feet of space and can be stacked up to 15 cots high (depending upon the manufacturer). Most preschool classrooms will need storage space for two horizontal stacks of cots. One option for cot storage is to place them on rolling dollies that fit under custom lofts. Some cots can be hung vertically on heavy-duty brackets, which can be located in an alcove or storage closet. In addition to storage for cots, there also needs to be an appropriate area to accommodate storage of the children's bedding.

- **Closets.** Ideally each classroom will have a closet for storage of its materials – in addition to other storage areas elsewhere in the center where bulk materials and shared supplies are kept. Carefully design each closet to maximize storage. Shallow but wide closets (18 inches deep x 36 inches wide) are preferable to deep closets so that material doesn't get lost in the back. Shallow closets should have a large door or pair of doors to allow for full access to the shelves. Walk-in closets are typically a minimum of 6 feet wide and 7 feet deep to allow for a 3-foot wide door with 18-inch-deep shelves on either side. It's best to configure walk-in closets with shelves on each of the three walls, with a clear floor space in the middle.

  For buildings with sprinkler systems, there are often building and fire code requirements regarding the minimum clearance between the top shelf and the ceiling. Your architect should make sure closet design is consistent with these requirements.

ART/MESSY PROJECT AREA

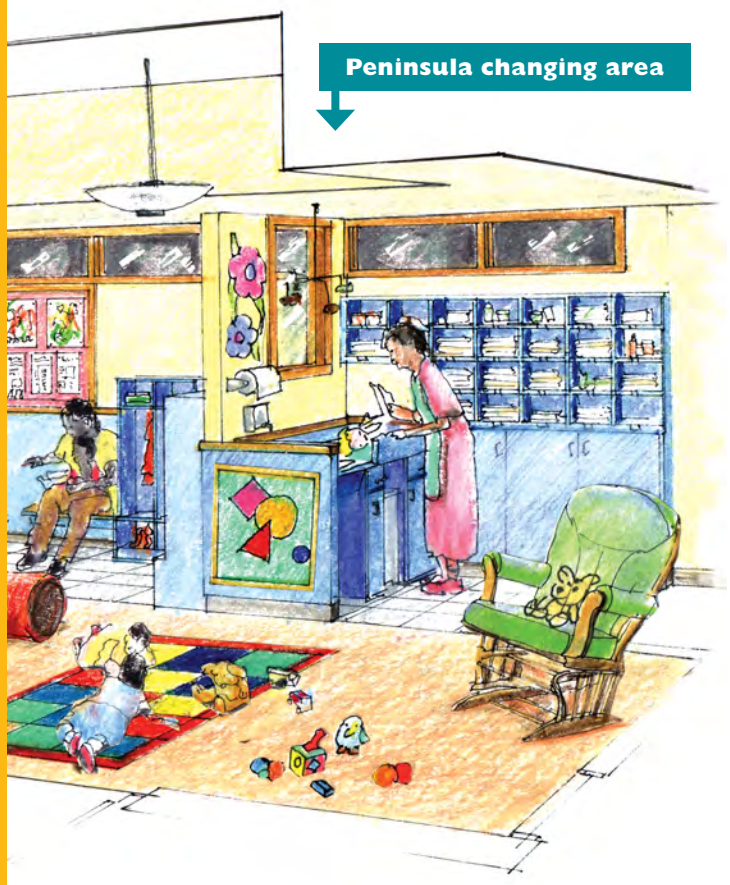
An area within the classroom can be created in a way that will support the messy, creative art process, while maintaining flexibility in the space as a whole. Usually it is desirable to provide a space with water-resistant floor and wall surfaces both for durability and ease of clean-up. Ideally include a floor drain in this area as well. Child and adult-height sinks placed in this area will facilitate clean-up as well.

FOOD PREPARATION COUNTER

Most centers use the classroom rather than a common cafeteria for eating, so it is advisable to have a dedicated area within the classroom for food preparation, even if children bring their own

meals and/or a separate full kitchen is used by the center. Typically, food preparation areas have a 34-inch-high counter (approximately 4 feet long) with an adult-height sink, a lockable refrigerator below the counter, and cabinetry above. The sink should not have cabinetry underneath, since a clear space is needed to comply with handicapped accessibility regulations. In infant rooms, where there is bottle and food preparation, it is helpful to have a space for a hot pot to warm bottles that includes a convenient electrical outlet and a larger food preparation area with a full-size refrigerator to accommodate all of the formula, breast milk, and first foods that are brought in from home.

It is preferable to locate the food prep area so that the teacher using the area is facing the classroom and can continue to provide proper supervision. In centers where space is at a premium, the food preparation area can be situated between two classrooms so that the square footage for the area and the plumbing can be shared. In addition, the food preparation counter can be adjacent to the diaper changing station so that the two adult sinks for each area can be located on either side of a wall and can then share the same wall piping.



Peninsula changing area

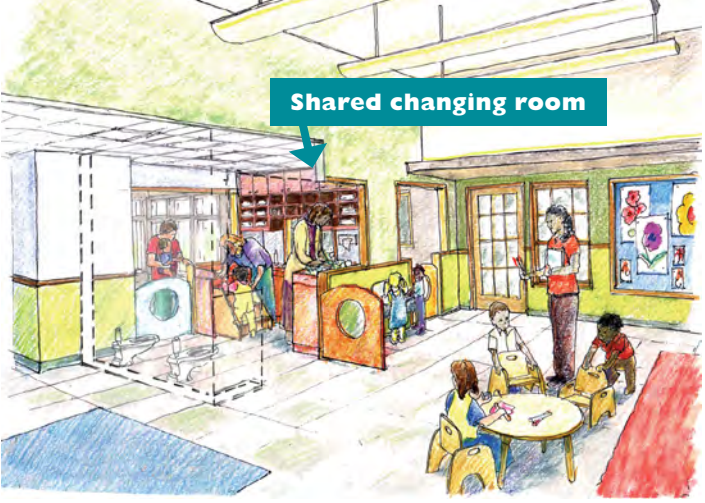
CHANGING AREA

The typical components of a diaper changing area include the counter/changing table (which is typically 42 - 45 inches long, 36 - 40 inches high, and 24 inches wide), sink, cabinets for diaper and supply storage, covered trash, and diaper receptacles. Cabinetry can be built to hold each individual child's diapers and wipes, and so that the teacher can reach the supplies without taking both hands off the child. A built-in changing counter will typically be 4 feet long and 2 feet wide. Generally the sink is placed immediately adjacent to the counter, resulting in a total counter length of 5 to 6 feet. Some centers opt to have steps built into the changing tables so that older children can climb up to the table rather than having teachers lift them. Good ventilation is an especially critical component of any changing area and should be considered during the design process.

Various configurations and locations are possible for changing stations, as described below:

- **Up against the wall.** The most common approach is to have the countertop and cabinetry installed against a classroom perimeter wall. This configuration occupies the minimum amount of floor area, although the area directly in front of the counter must be reserved for adults to stand and change diapers. A challenge presented by this type of configuration is that the caregiver's back is to the rest of the classroom. One solution is to install a mirror on the back wall to provide visual contact with the children in the classroom.

- **Peninsula.** This option involves installing the changing counter perpendicular to a perimeter classroom wall. This enables more direct or to-the-side visibility for the caregiver. The peninsula option also offers the ability to create inside corners and other nooks and crannies in the classroom. An example is illustrated to the left.



- **Shared changing room.** When more floor area is available, having a shared changing room can solve many of the problems identified in the options on the previous page. Sightlines are maintained by situating the changing counter so that a caregiver can face the activity space when changing a diaper. In this configuration it is important to provide a 4-inch minimum changing guard (lip) at the edge of the table to ensure that the child cannot roll off the table. Note that since the space is distinctly separated from the classroom activity areas, the floor area cannot be counted as activity space. These shared changing rooms are typically 35 to 40 square feet in size, allowing enough space for accessibility under ADA guidelines. Many centers choose to place a small gate between the changing area and the classroom to prevent children from wandering in unattended. If this is the case make sure to provide enough room for gate clearance. In some jurisdictions a shared changing area may not be allowed by licensing because it is considered to be a separate room, so be sure to check carefully with your local licensor during the planning process.

The area under the hand washing sink must be kept clear for handicapped accessibility. The remaining area should be used for diaper disposal and, in the case of stations intended for older children, a movable stair. There are several manufacturers that make free-standing changing table units with stairs that can be incorporated into the changing area layout.

CHANGING AREA STORAGE

Here are some tips for including storage solutions in the design of your changing stations:

- Plan on having two open cubbies per child, one for diapers and one for wipes and ointment (located in a plastic bin). Typical sizes for these cubbies are 6 inches high x 12 inches wide x 12 inches deep.

- Open cubbies should be located within easy reach of a caregiver who is standing in front of the changing station – either on the wall adjacent to the changing counter or above the changing station.

- Provide a minimum of 30 inches of clearance when locating upper cabinets above changing stations to minimize the possibility of a child hitting his or her head on the upper cabinet. Because of these clearance requirements some teachers find that storage cubbies above the table are not practical since they are often above their reach, and therefore prefer them on the wall next to the counter.

LOFTS AND PLATFORMS

Raising the height of the floor is a simple way to enhance the environment, and define and separate activity areas. Even a very basic platform can be introduced by using a carpeted surface 6 to 12 inches above the floor. This small amount of elevation separates one place from another, and can be perceived as a large threshold for a child

who may be no more than 24 inches tall. Lofts that have platforms higher above the floor often include play space or storage below. Lofts will make your classroom feel larger by essentially doubling square footage in that area. However, it is important to note that while this provides you with more space it is unlikely that it will counted as double space for licensing purposes.

NOTE: Be careful to check local fire codes before purchasing or installing a loft. In some jurisdictions sprinkler systems may be required below the loft area if it is being used as play space. If that is the case, the space below a play loft can also be used for much needed classroom storage, including the storage of children's sleeping cots. At the right is an example of a loft with built-in cot storage.

Finally, lofts and platforms can be used in existing buildings to help children see out of high windows or to make large spaces with high ceilings seem more appropriately scaled for young children.

CHILDREN'S BATHROOMS

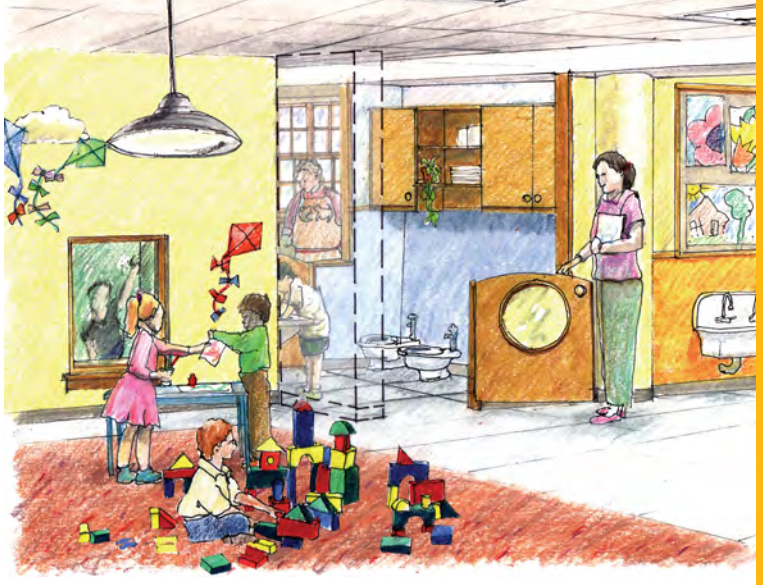
There are a number of important considerations for designing children's bathrooms:

- **Proximity to classrooms.** Having children's bathrooms directly accessible from each classroom enables caregivers to remain in the classroom with the larger group of children while monitoring toileting activities. In addition, when the bathroom is situated in this way and equipped with child-height sinks and toilets, children can increase their competence and autonomy by using the fixtures on their own.

- **Proximity to playgrounds.** The photo below shows a children's bathroom incorporated into the playground. Adding this feature during new construction will add little in the way of cost for a tremendous benefit to the program. While this may not be possible in renovation projects, you can still make efforts to minimize the distance between the playground and a bathroom that children can use.

- **A cost-effective strategy.** Having a dedicated bathroom for each classroom is expensive and not necessarily a preferred arrangement. One restroom can be located directly off of two classrooms when located in between and shared by both groups of children.

Locating bathrooms adjacent to children's play areas enables teachers to stay with the group and helps children increase their autonomy.



- **Supervision and privacy.** Sightlines to and from the restrooms are typically provided through a combination of low gates, partitions and/or half doors. This type of configuration provides adequate privacy for children through preschool age while allowing sufficient supervision by adults in the classroom. The sketch above illustrates this arrangement.

- **Code requirements.** The state child care licensing agency, plumbing officials, and building officials generally have requirements regarding the quantity of plumbing fixtures required for the number of children who will be using them, how the bathrooms are configured, and how they must accommodate children with physical disabilities. These requirements are typically included in each agency's statewide regulations. Requirements are usually consistent across the different agencies, but not always, so it is important to review all of the regulations in the early stages of the project and meet with the appropriate officials from each agency to resolve any conflicts or ambiguities.

- **Fixture height.** Toilets and lavatories in children's restrooms should be mounted at child-appropriate heights so that children can easily and safely use them on their own with minimal assistance from teachers. In certain jurisdictions, the mounting heights are specified in the state child care licensing and/or accessibility regulations. The following are general recommendations for mounting heights for different age groups, but be sure to check on specific requirements in your state:

AGE GROUP	TOILET HEIGHT	LAVATORY HEIGHT
TODDLER	12"	18"
PRESCHOOL	12"	22"
KINDERGARTEN	15"	30"

- **Types of fixtures.** Several plumbing fixture manufacturers now make 12-inch-high toilets specifically designed for small children. Some models have decorative and brightly colored toilet seats. Sinks are not typically child-specific but can easily be mounted at child-appropriate heights.

- **Adequate hot water supply.** Demand for hot water in child care centers tends to be constant, but there are certain times of the day when the demand peaks, especially before meal times. When planning for the hot water supply it is important to make sure this is given consideration and an adequately sized hot water heater is selected. For example in a 100 child center you would typically want to have a 100 gallon capacity hot water tank.

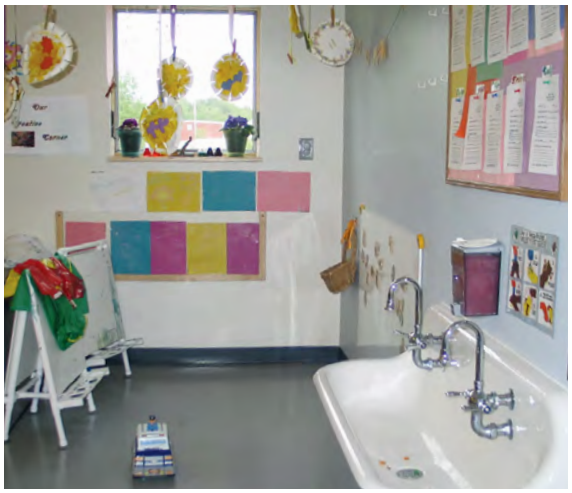
- **Floor drains.** Plumbing codes typically require floor drains in all toilet rooms. Even if they are not required by code they are an excellent way to handle the inevitable sink or toilet overflows and facilitate cleaning. It is important to remember to include the drains when you are designing the project; they are relatively simple to add during construction, but are much more complicated and expensive to retrofit after construction is complete.

- **Floor and wall materials.** All areas in a child care center are used intensively, but none is more used and abused than the children's bathroom. The floors and

walls endure bleach and other harsh cleaning chemicals on a daily basis. It is worthwhile to spend more up front on durable bathroom finishes so that they do not need to be frequently replaced. A good durable solution for flooring is sheet vinyl tile, which is easy to clean, holds up well, and, if installed correctly, does not have any seams or joints into which water and other liquids will seep. Ceramic tile is a natural choice as a durable bathroom material, but may not be the best choice for a child care center because of the high level of maintenance required. The grout used is very porous and subject to staining and odor retention if not sealed frequently. Fiber Reinforced Panels (also known as FRP) are a durable and inexpensive wall material option. This material is often used in commercial kitchens, holds up well, and is very easy to clean and maintain.

CHILDREN'S CLASSROOM ACTIVITY SINK

In addition to the sinks in the children's bathroom it is ideal to provide at least one child-height activity sink in the classroom itself. The sink should ideally be located on tile, in an active/messy area of the classroom away from entries and exits. Some centers use trough sinks, which allow more than one child to wash hands at the same time, but a word of caution is that some children also see these as fun to use as a bathtub! You may want to consider special features for these sinks, such as automatic water turn-on to eliminate the need for paint-covered hands on sink knobs. Also plan to



install a child-height paper towel and soap dispenser adjacent to the sink. Where allowed by state code, some centers have reduced costs by placing one or all of the bathroom sinks in the classroom but right outside the bathroom door so that it can serve two purposes.

CHILDREN'S SLEEP AREAS

In most toddler and preschool classrooms children rest on cots that are taken out and put away as needed. You will need to make sure that the classroom has enough space for children's rest cots to be placed around the room without having to move too many pieces of furniture, equipment, etc. Also, you will need sufficient accessible storage for the cots when they are not in use. In infant rooms it is very common to identify the area of the room that will be considered the "sleep area." This area should be large enough to accommodate the necessary number of cribs, spaced as far apart as required by licensing regulations.

WINDOWS

Windows are more than a source of natural light, they are a way for children to see beyond the walls of the classroom where they spend most of their days. Being able to orient themselves to the world outside and observing different times of the day, weather, and seasons is an important experience for children as well as adults. Ideally, if you are designing a new center, classrooms will include windows at a height that allows children to look out throughout the day. A nice feature to consider is the addition of a window seat or bench that will allow a child to sit quietly and look outside at things that might be strategically placed there, such as bird feeders or special plantings. If you are planning the center in an existing structure, consider other options to give children visual access to the outdoors. This might include building a loft or platform to a high window.

GROSS MOTOR ROOMS/ MULTIPURPOSE SPACES

Many child care programs are located in climates where it may be difficult to provide the desired amount of gross motor play outdoors during all seasons. An effective alternative to outdoor play is the dedication of indoor space to serve as a "gross motor room." This space is often designed to be multipurpose so that it can support other activities as well as indoor play. In some centers, this dedicated room is used for school-age children, such as after-school, holiday, and summer camp programs. Ideally, abundant storage should be provided adjacent to the room so that the different furnishings and equipment for each age group and purpose can be readily accessed for a particular age, setup, and stored when not in use. For example, large soft blocks might be great for preschool construction/gross motor play, but will be traded out for furniture such as tables and chairs for school-age activities.

Another common use of these rooms is as a large meeting room or gathering space. Again, this requires the storage and flexibility to shift around equipment and furnishings to meet immediate needs.

MULTIPLE USES FOR HALLWAYS/ CIRCULATION AREAS

The hallways within a building typically take up a significant amount of space. In child care centers, circulation can take up as much as 20-30% of the total area of the building. Since hallways are not generally used for activities, they are kept to a minimum size and are finished with durable but inexpensive materials, saving space and money for other areas in the center. This is a common practice, but unfortunately can result in an unfriendly and institutional feel in areas of the center that are seen by most visitors to the building, and where there can be a great deal of movement and impromptu activity.

In a well-designed center, hallways can enable adults and children to move from one destination to another, as well as encourage and support different activities. These areas, sometimes known as "commons," "living rooms," "play galleries," "neighborhood streets," and even "gross motor" spaces, can extend the available space for the nearby classrooms. Alcoves and bays ("nooks and crannies") with a window seat or carpeted platform could be used for story time or special projects, and can encourage spontaneous interactions between parents, children, faculty, and staff as people are moving through the center. When these alcoves are located near the entrance to a classroom, they can serve many purposes, such as transition areas for children (and parents) uneasy with separation for the day, with comfortable seating in a semi-private place away from the main reception area or "on display" in the corridor or classroom.

It is important to note that building codes sometimes have limitations on the types of finishes and millwork that can be used in hallways. The limitations are based on the construction type of the building and whether there is a sprinkler system. The project architect should review the relevant codes early in the process to determine whether any of these hallway design approaches can be incorporated.

In a well-designed center, hallways can enable adults and children to move from one destination to another, as well as encourage and support different activities.

PROGRAM SUPPORT SPACES

STAFF LOUNGES

Staff lounges provide a place for the teachers and other center staff to relax and recharge themselves during the day. Ideally, the space should be set apart from the classrooms and other occupied areas so that it can be a safe haven, far from the distractions and interruptions that are ever-present in the center. To make the space useful and comfortable, it should be designed to have room for a refrigerator, sink, microwave, a small table for eating, a telephone, and a small seating area with comfortable adult-size chairs and sofas.

STAFF WORK/RESOURCE ROOMS

Work rooms are a valuable support space where copiers, laminators, and office supplies can be used by both administrative staff and teachers. A well-lit and uncluttered work surface with access to a computer, phone, and other supplies will enable teachers to plan and prepare for activities. This space is often also equipped with mailboxes and other communication aids to facilitate effective management of the center. This space works well near the administrative offices and reception desk but could be located closer to the classrooms if preferred.

Often, this space is sized to allow several teachers to gather together to prepare work and activity plans, discuss program and curricular details, and support other high-quality child care activities. Ideally, it is large enough to accommodate a good-sized table that can be used for larger meetings and for laying out workplan materials. It should also have enough space to allow for the display of teacher resource books and materials that can be shared among staff.

OFFICES

Even in small or average-sized centers, there are a handful of administrative and management staff who require office space, including a director, head teacher, and secretary/receptionist. Larger centers and those offering more comprehensive services to families will often have a greater need for dedicated office spaces for additional personnel such as a bookkeeper, social worker, education coordinator, nurse and assistant director. Since the number of offices needed is directly related to the number and type of staff in the center, it is important early on in the design process to determine how many and what type of office spaces will be required.

Typically, the director's office is located near the reception area and should be large enough to have small meetings with teachers or parents. It should be open and welcoming but also needs to

be acoustically and visually separate for private meetings. Many centers install interior windows in the director's office to provide a connection with the space and people outside; shades or blinds can then be closed to allow for more privacy when needed.

Other office space may be near the director's office but does not need to be immediately adjacent to the reception area. Some centers prefer to have supervisory staff, such as an education coordinator, located closer to the classroom space. When there are several staff members requiring office space, it may be possible to have a shared office space to save room and lower costs, since not every member of the administrative staff needs the same level of privacy. However, it is still desirable to have private spaces available in the building for confidential meetings or telephone calls. When designing a child care facility it is important to remember the highly sensitive nature of conversations that may need to occur, and for office or meeting spaces to allow for private discussions.

MEETING ROOMS

In addition to office spaces, careful consideration should be given to the number and types of meeting rooms that will be needed. During the design process, think about what type of meetings will be held, how many people will participate, and how private the space needs to be. Some gatherings could take place in a multipurpose room, and, the director's office, if large enough, could have a small table for meetings. But ideally there should be at least one dedicated space in the center for a few people to hold a confidential meeting. In addition, depending on the type of services the program will offer, there may be a need for additional small meeting rooms that can also be used by visiting therapists or for parent conferences and small group meetings. Many centers also provide a dedicated space as a parent resource room, which could double as a small meeting space during the middle of the day.

NURSE – SICK CHILD AREA

Most jurisdictions have specific protocols for how to treat a child who becomes ill at the center. Some states require that there is a nurse on staff, especially if infants and toddlers are enrolled. Even where this is not required by law, some programs choose to have a nurse on staff, and have a dedicated room with a bed or cot for a sick child to occupy while waiting to be picked up. Other programs with less space available may have an alcove in the director's office that can accommodate a cot for a child to lie down. Whether or not there is a dedicated office space for the nurse and sick child, the designated area should have easy access to a sink and bathroom. How the nurse's office and sick child area are handled should be decided early on in the design process so that sufficient space can be allocated for these functions.

KITCHENS

There are several types of kitchens that are used in child care centers. Early on in the design process it is important to take the following steps:

1) Identify how meals and snacks will be handled (cooked onsite, brought from home, catered by an outside vendor, etc.).

2) Work with your architect to become familiar with all relevant codes related to kitchens of any type.

3) Confirm these requirements with officials from the Board of Health, Building and Fire Inspectors, and Child Care Licensors.

- **Commercial kitchen.** When hot meals are prepared onsite, the kitchen must conform to the requirements of a commercial kitchen. Commercial kitchens have institutional grade equipment and must meet stringent fire protection codes. They require special types of cooktops and exhaust systems that alone can cost as much as $30,000. A commercial kitchen consultant may need to be added to the design team to help with layout and equipment specifications. While there is too much variation to provide exact costs for construction of a commercial kitchen, it is important to note that it will substantially increase your overall project costs.

- **Warming kitchen.** When hot meals are prepared off-site and brought in by a caterer on warming carts, the kitchen can be somewhat smaller and less complex. But a warming kitchen will still need to be large enough to accommodate a commercial-type dishwasher (if non-disposable dishes, cups, and cutlery are used), ovens for warming, and large refrigerators. The actual cost will vary greatly depending on the specifics of how the kitchen will be used.

- **Accessory kitchen.** When meals are brought from home, the kitchen can be very modest, but it should still have a full-size refrigerator, microwave, sink, and dishwasher for the sterilization of toys. Cooktops of any kind, including residential-style electric ranges, can trigger the need for extensive fire protection equipment mentioned above. This type of kitchen can easily be adjusted to serve as an activity kitchen for cooking projects with children (see below).

- **Activity kitchen.** Kitchens can also have a social and educational value. Just as the kitchen is the heart of activity in the home, some centers create a small centrally located activity kitchen for cooking projects, which are popular activities for young children and a great venue for exploration and discovery. Activity kitchens allow children to

Activity kitchens can become the heart of activity in your child care center, just as it is in your own home.

participate in mixing and baking activities. Typically they are configured with a low counter to separate the children from the actual galley kitchen where an oven is located, while providing them with a work surface and allowing clear views from a child's height. When configured in this way, this type of kitchen can be used for science and other messy projects as well.

LAUNDRY

While laundry equipment is not typically required by state child care licensing regulations, it is extremely convenient to have in the center. Depending upon the availability of space in the building, the laundry area can be limited to only the washer/dryer appliances and can be as small as a closet with doors that open onto a hallway. Ideally, the laundry area is a separate room with the washer/dryer appliance, a laundry sink, counters for folding and storage cabinets/shelving. Because the washer and dryer are used frequently, it is worth having commercial grade appliances that will stand up to constant use. The laundry room can be easily combined with a janitor's closet to save space but it should ideally be located near the infant and/or toddler rooms where the laundry demand is greatest. Since the appliances can be noisy, the walls of the laundry room should have acoustic insulation and the room should not be located next to any crib areas.

ADULT RESTROOMS

The number of adult restrooms provided is typically based on the full-time occupancy of the building. With this approach, allowances should be made for the few parents or other adults who may be present in addition to staff. The state plumbing code generally specifies the number of plumbing fixtures and toilet rooms that are required for staff in educational buildings (including child care centers). If multipurpose rooms are planned to accommodate larger groups of adults for parent-teacher nights, adult education activities, etc., or if your center has frequent visitors throughout the day, then you will want to include more adult restrooms than are required by law.

When possible, it is preferable to locate the adult toilet rooms at different ends of the building so that they are near all classrooms and other areas used by adults. One of the toilet rooms should be located near the reception area for parents and others who may be visiting the building.

Keep in mind that the American with Disabilities Act (ADA) guidelines and state accessibility regulations typically require that every toilet room comply with handicapped accessibility requirements. The rules for a single toilet/lavatory restroom include clear floor space for wheelchair turning and at the lavatory, grab bars, and specific mounting heights for plumbing fixtures and dispensers. As a rule of thumb, the size of an accessible restroom with one toilet/one lavatory is approximately 6 feet x 7 ½ feet.

BUILDING AND MECHANICAL SYSTEMS

Building support spaces – including electrical, mechanical, and janitorial closets; hallways; heating; ventilation and air-conditioning systems (HVAC); and the walls of the building structure itself – are often overlooked during early planning and in preliminary layouts. But these spaces are essential to the overall functioning of the center and can take up a significant amount of square footage within the building.

- The **electrical room** houses the main electrical panel and sometimes the computer and telephone equipment, and usually requires about 60-100 square feet of space. The building code typically requires that the electrical room walls have a fire-resistance rating. Generally, it is best to locate the electrical room in an area of the building that it is accessible to service people without disrupting children's activities.

- The **mechanical room** is typically larger, ranging from 100-200+ square feet, depending upon how much equipment is kept in the room. The mechanical room is where the boiler, HVAC units, and hot water heater(s) are located. If the building is equipped with a sprinkler system, the pumps are often located here as well. The building code often requires that the mechanical room walls have a fire-resistance rating. Also be aware that some codes do not allow doors to mechanical rooms to open directly into spaces occupied by children. Again, this room will ideally be located where service people can have easy access without being disruptive to children's areas.

- Many state plumbing codes require at least one service sink (otherwise known as a janitor's sink or mop sink) in a building. This is ideally located in a dedicated **janitor's closet** where all cleaning supplies can be kept, locked and out of reach of children. When space is tight, the janitor's room is sometimes combined with the laundry room described above.

Lighting

In the design of child care centers, the sources and control of light are critical to the quality of the physical environment. This section describes key considerations for both natural and artificial lighting.

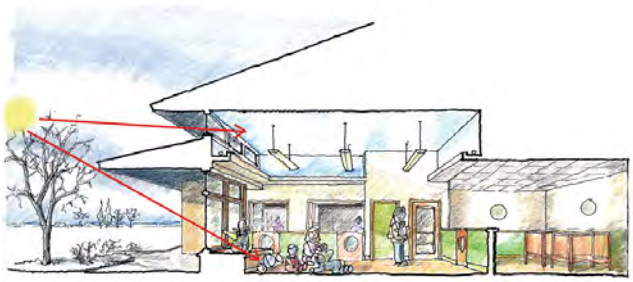
MAXIMIZING NATURAL LIGHT

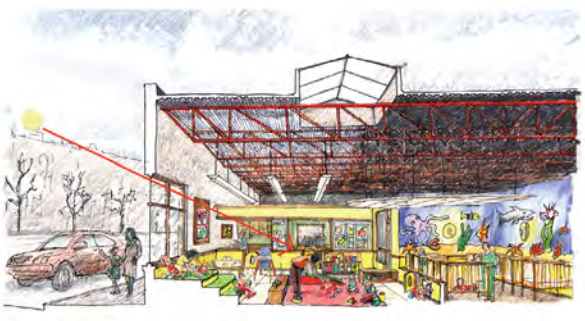
Providing abundant daylight from a variety of sources is always the most preferable lighting for child care centers, especially for spaces that will be occupied by children. Each classroom should have plenty of windows that bring in natural daylight, and are built at a child's height close to the floor for very young children for viewing the outdoors throughout the day.

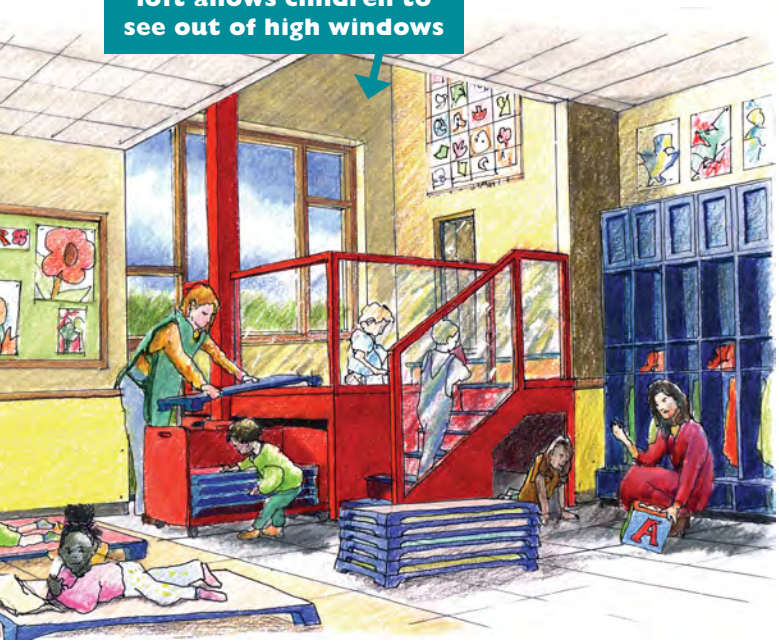
It is also recommended that classrooms have the ability to moderate the amount of sunlight that comes through the windows during the day. There are many ways to provide control, both active and passive:

- **Blinds, curtains, LCD (liquid crystal display), and other glass glazing systems.** Blinds used in child care centers must be carefully crafted to prevent curious fingers from damaging them and to keep the pull strings safely out of reach. For example, some window manufacturers now provide windows with horizontal blinds and accordion shades located between the panes of glass, out of reach and requiring no cleaning. Roller blinds (shades) are sometimes used, but again must be designed with children in mind. Curtains are not commonly seen in child care settings because they are fragile and can be flammable.

- **Exterior sunshades, building overhangs, or awnings.** These tend to reduce direct sunlight in the summer, and admit more in the winter (see figures below). These elements moderate the heat associated with sunlight and complement interior heating and cooling needs.







NATURAL LIGHTING CHALLENGES IN BUILDING RENOVATION PROJECTS

- **High windows.** If your project involves the renovation of an existing building, it is likely that the windows were originally constructed for purposes other than child care. For example, mill/industrial buildings may have large, beautiful windows but they are often placed high on the wall since they were intended to admit daylight deep into the building's interior. In child care the goal should be to provide views to the outside for young children, which is more difficult with higher windows. One strategy to compensate for this is to install a loft/platform area that, in addition to providing an interesting play area, allows children to have direct access to the windows. Platforms should be designed with children's safety in mind, and in particular, if the windows are operable, you'll need to make sure that a curious child cannot open and climb out of the window. Another caution is to check with local fire codes regarding the usability of space below the platform; in some locations sprinklers may be required under the platform if the area will be used by children. In locations where this square footage cannot be counted as activity space, it can make a great storage area.

- **Fewer windows than desired.** Another challenge is that the building you are seeking to renovate may not have as many windows as would be ideal in a child care center. When that is the case the priority should be to try to add windows wherever possible. For example, it is very common in older buildings to find a number of large doors, often including garage-like doors. Any doors that are not needed can easily be turned into windows as shown in the illustration below.

Classrooms should always be placed around the perimeter of the building so that the spaces occupied by children all day will have a window facing outdoors. Interior spaces that do not have exterior windows can then be used for auxiliary functions, such as gross motor rooms, meeting areas, parent rooms, etc. When classrooms or other spaces do not have access to an optimal amount of natural light through exterior windows, consider other options such installing skylights or borrowing light from an adjacent space by placing interior windows between rooms.

ARTIFICIAL LIGHT

Artificial lighting makes up a considerable portion of the light in most children's centers. This type of lighting is a part of the physical environment that is often taken for granted, yet it has an important impact on the overall character of interior spaces. Artificial lighting is an aspect of design where a relatively modest additional investment can add a great deal of value by making space more varied, usable, interesting, and pleasant.

Like many offices and stores, child care centers often use an inexpensive and efficient lighting strategy consisting of regularly spaced fluorescent fixtures within the ceiling's acoustic tile grid. While this arrangement creates a well-lit space, relying exclusively on fluorescent lighting and only one type of fixture in a room is likely to result in a monotonous and institutional feel. This approach also limits a teacher's ability to vary lighting throughout the day or for different activities.

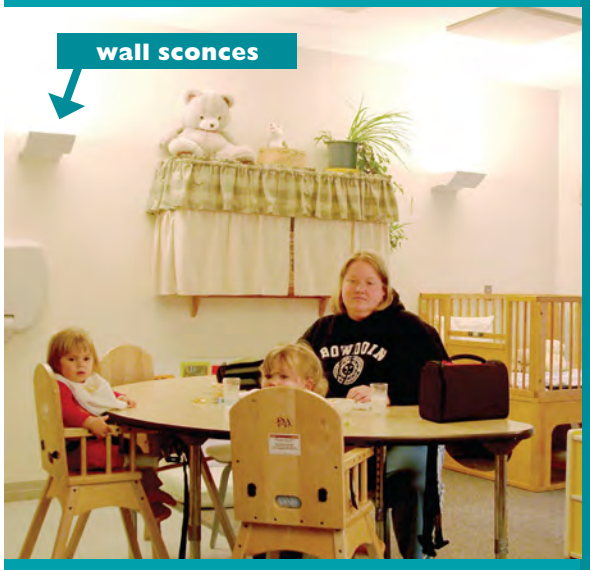
To increase flexibility with artificial lighting:

- Give careful thought to the way that lighting can support all the different uses of the space.
- Use a variety of fixtures and types of artificial lighting.
- Provide teachers with the ability to adjust the lighting in each classroom.

Different lighting schemes in the center can be achieved by altering the direction and distribution of light and by using a variety of fixtures and bulb types. More details on these terms and options are provided in the table that follows.

It is important to note that lighting technology is a rapidly evolving field. Efforts are underway to create a much wider range of energy efficient lighting options and to improve the quality of lighting available. Work closely with your architect to ensure that you are selecting lighting that not only fits within your budget, but also creates a pleasant and interesting environment for its occupants and is economical to operate long-term.

ABOVE: Turn what otherwise might be a very institutional hallway into a lively display area by using lighting creatively. In the photo above, track lighting is used to focus pools of light on wall displays. This lighting bounces off the wall creating indirect lighting for the space.



ABOVE: These wall sconces provide a very bright light, but since the lighting is indirect (it bounces off the ceiling first) it creates a soft ambient light to illuminate the room.

The classroom pictured above uses a mix of four types of lighting:

- **lay-in" fluorescent light** fixtures that provide the primary source of direct lighting.
- **fluorescent light** built in to a "cove" to provide indirect light that bounces off the ceiling first – a lighting strategy that captures the economic advantages and brightness of fluorescents, but with a softer feel that has no glare.
- **recessed incandescent task lighting** to focus light on activity areas.
- **incandescent track lighting** around the classroom's perimeter to provide either direct or indirect lighting depending on the angle of the fixture, and which can be moved along the track to different locations.

ABOVE: These pendant light fixtures suspended from the ceiling use incandescent bulbs to produce soft, multidirectional ambient light. These unshaded lights should not be used with high-watt bulbs, because they will create glare unless the amount of light is carefully controlled with a dimmer switch.

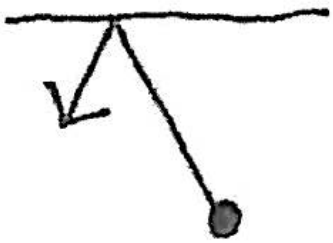
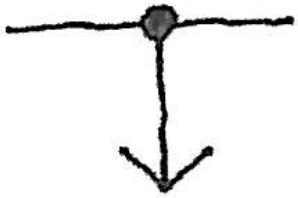
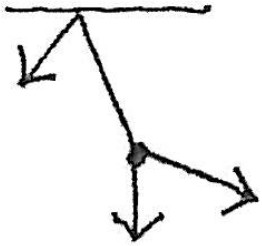
ABOVE: This center uses recessed task lighting to provide direct lighting for an activity area and further define and separate that part of the classroom. Notice the pool of light on the floor that marks the center of the area and will become the natural focus of activity.

NOTE: By placing one or more fixtures on separate switches (circuits) and installing dimmers, teachers can use artificial light to create different moods, introduce variety in a space that otherwise becomes very familiar, or signal to the children that it is time to transition to another activity.

LIGHTING TABLE

The following table is intended to assist you in better understanding lighting terminology so that you can work effectively with your project architect to select the most appropriate lighting for spaces within your center.

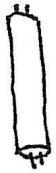
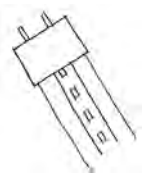
LIGHTING DIRECTION: There are three basic ways that light is directed into a space, as described below. Each of these may be achieved with ceiling-mounted, wall-mounted, and pendant lighting.

INDIRECT	DIRECT	MULTIDIRECTIONAL
Indirect light reflects off of another surface (such as the ceiling or wall), with the bulb typically not visible. This creates a very soft light, which works well for ambient lighting.	With this type of light the bulb is directly visible to the eye. It is a very efficient and bright type of lighting, but can be harsh and often causes a glare.	This combination of direct and indirect lighting is generally achieved by covering the bulb with a perforated shield that allows some direct light through,and reflects some light off nearby surfaces. It is often seen in pendant lighting and provides very good light to a space.
		

DISTRIBUTION OF LIGHT: "Distribution" refers to how light shines into a space. There are two terms that are typically used when talking about the distribution of light:

TASK	AMBIENT
This is focused lighting that shines into a particular area to assist people with performing a specific task that requires a lot of light and limited shadows. This type of light would be effective, for example, in a reading corner.	This is the term used to refer to general lighting in a space where the goal is to provide overall lighting for a room, but not for a specific task.
	

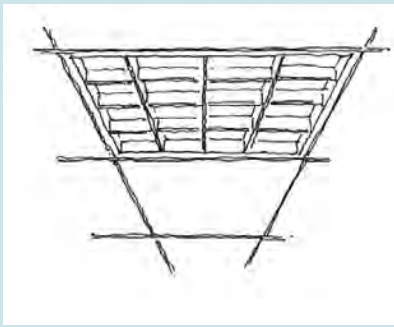
BULBS: The bulbs that you use will have a significant impact on a number of variables, including the type and quality of light, the initial cost, and the cost efficiency down the road. This is an area of lighting that is rapidly evolving in an effort to combine the best qualities of lighting with the greatest energy efficiency. Note that the term "lamp" is generally used by lighting experts instead of the more familiar term "bulb." At this time, the types of bulbs commonly used include:

TYPE	CHARACTERISTICS	USE	PROS AND CONS	EXAMPLE
FLUORESCENT TUBE	Most often used in commercial lighting. Typically has a cool, sometimes harsh light color.	Most often seen in flat ceiling fixtures used in office, retail, and other commercial spaces. Provides ambient light to a space.	■ Energy efficient and inexpensive to install. ■ Has a long life. ■ Expensive to dim.	
FLUORESCENT "A" LAMP RETROFIT	Fluorescent bulb that is made to fit into typical light bulb sockets (such as those you would find in your home).	Can be used in most fixtures requiring a standard bulb.	■ Greater energy efficiency than standard bulbs and has a long life. ■ More expensive than traditional bulbs. ■ Often produces fairly harsh light.	
COMPACT FLUORESCENT (PL)	Bulb in which the tube has been bent into a compact shape.	Generally used in recessed downlights ("cans") and wall-washers.	■ Good accent/task lighting, less effective for ambient lighting.	
INCANDESCENT – "A" LAMP	Standard bulb that generally has a warm, residential color. Typically found in 40 to 100 watts.	Generally used in table and floor lamps, wall sconces, and ceiling fixtures.	■ Low up-front cost – but not energy efficient and does not have a long life. ■ Inexpensive to make dimmable.	
INCANDESCENT – "R" OR "PAR"	A larger light bulb with a directed and/or focused beam, generally found in 60 to 150 watts. Has a warm light color.	Generally used with flood lights, wallwashers, and downlights.	■ More expensive than standard bulbs, but still reasonably affordable to make dimmable. ■ Not energy efficient and does not have a long life.	
HALOGEN "MR-16"	Very small bulbs that use low wattage (typically 12v). They produce a very bright white light.	Used for accent lighting such as at a reception desk, art display, etc.	■ More expensive than standard bulbs. ■ Not energy efficient and does not have a long life. ■ Inexpensive to make dimmable. ■ Provides a unique type of light to highlight objects.	
FLUORESCENT TUBE LIGHT EMITTING DIODE "LED"	Similarly sized to standard fluorescent tube, but has a service life 3 to 5 times as long. Can reduce electrical consumption by up to 50% when compared to a standard fluorescent tube.	Can be used in place of most incandescent/fluorescent lighting fixture types. Some existing fixtures can be retrofit with LED lights.	■ Very energy efficient. ■ Long life span. ■ Can be more challenging to incorporate dimming.	

FIXTURES: Fixtures are the aspect of lighting with which you are probably most familiar. There are fixtures that you would use in your home, such as table lamps and floor lamps. But since these come with cords and easily tip over they would not be ideal for child care use. However, there are a range of fixture types that do work well in child care. These include:

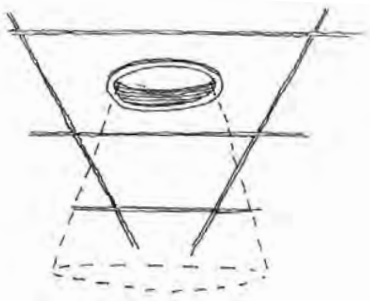
LAY-IN

These fixtures are laid directly into the suspended ceiling to provide overall light to a space. They are found in most commercial settings. While they do provide a bright and efficient light to a space, used alone they also create a very institutional feel.



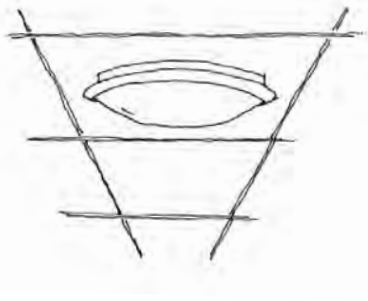
RECESSED

These are small circular fixtures set into the ceiling so that most of the fixture is concealed (sometimes referred to as "cans"). They are a fairly standard fixture that is inexpensive to install. They can be used for spot lighting, task lighting, and as wallwashers. When used in child care a lens should be installed to conceal the bulb.



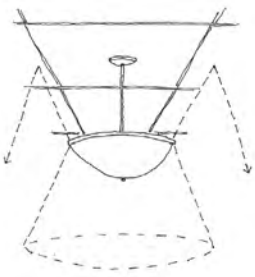
CEILING MOUNTED

These fixtures attach directly to the ceiling. They are often found in residential settings to provide general light to a room. They are standard fixtures that are inexpensive to install. Some styles can have an institutional feel.



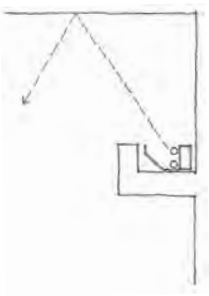
PENDANT

This is a light fixture that hangs from the ceiling. It is available in a wide variety of styles and can provide both general and decorative lighting to a space. In spaces with high ceilings this type of lighting can help to reduce the scale of a room by making the ceiling appear lower. While this can be an expensive lighting type, it has a much less institutional or commercial feel and is visually interesting. Make sure the fixtures selected are durable enough to prevent them from breaking.



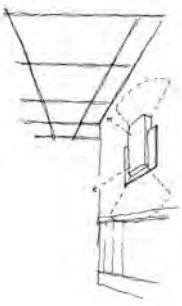
COVE

These fixtures produce an indirect type of light, with the fixture concealed from view in a ceiling detail, causing the light to bounce off the ceiling. It creates a soft type of accent/ambient lighting that adds to the overall character of a space. This type of fixture may be somewhat expensive to install but works well with energy efficient bulbs, reducing long-term costs.



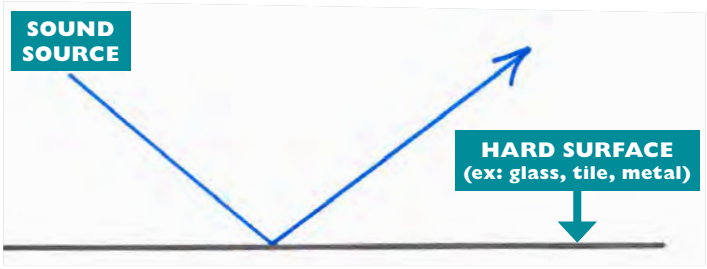
SCONCE

This is a fixture that is mounted on the wall. It is an attractive type of lighting that will create visual interest but does not provide a high level of light. It works well in sleep rooms and decorative areas.

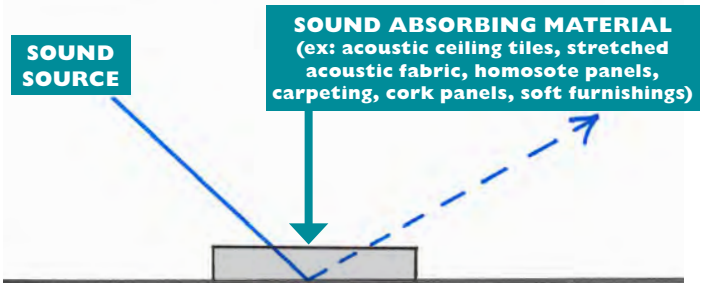


HOW SOUND WAVES MOVE AND HOW DIFFERENT MATERIAL PROPERTIES REACT WITH THE SOUND

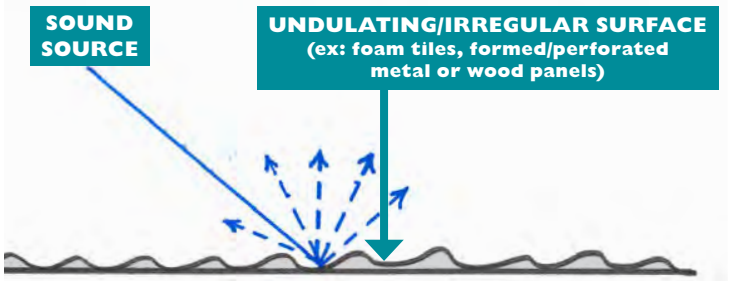
REFLECTION



ABSORPTION



DIFFUSION



Acoustics

Sound can have a profound impact on a young child's development. While different sounds (human voices, soft music, and natural outdoor sounds like leaves rustling or birds chirping) can create richer and more comfortable surroundings, too much noise can lead to discomfort, distraction, hearing loss, stress, anxiety, and even illness. Acoustic control over the level and type of sound should therefore be a key consideration in the design of early childhood centers. The ideal space will provide a comfortable and pleasant-sounding environment while also reducing unwanted noise.

PROPERTIES OF SOUND

Sounds can be absorbed, reflected, reverberated, echoed, diffused, and directly transmitted throughout a space. How a sound wave moves depends on the room's size and materials. Certain spaces–such as rooms finished with hard materials (like metals, glass, and tiles), or that have high ceilings, are open to other classrooms or use areas, or are generally large in scale–tend to suffer from more noise pollution than others. In addition, hard surfaces generally reflect more sound back into the space, creating an echo, while soft, plush, or porous surfaces more easily absorb sounds. Finally, location matters; for example, centers located in dense urban areas or right off of a highway or on a busy street tend to be more contaminated with sound pollution.

The diagrams to the left illustrate how sound waves move and how different material properties react with the sound.

CONSIDER THE SOURCES OF SOUND

Too many sounds, especially loud noises or echoing, can be distracting and cause teachers and children to talk louder to be heard, reducing the quality of the learning environment. There are many sources of background noise that affect a center's environment:

- **Inside.** Heating, ventilation, and air-conditioning (HVAC) units, humming of electrical equipment, technological devices, running water, noise from adjacent classrooms, and adults and children within the space all add to the noise levels in the classroom.

- **Outside.** Traffic, airplanes, equipment (like lawnmowers and snow blowers), construction, and noisy neighbors can add to interior noise levels too.

Although it is nearly impossible to remove all of these sounds entirely, there are different materials and building elements that can significantly reduce noise levels.

DESIGNING FOR SOUND

PLAN AHEAD TO MINIMIZE UNWANTED NOISE IN NEW CONSTRUCTION

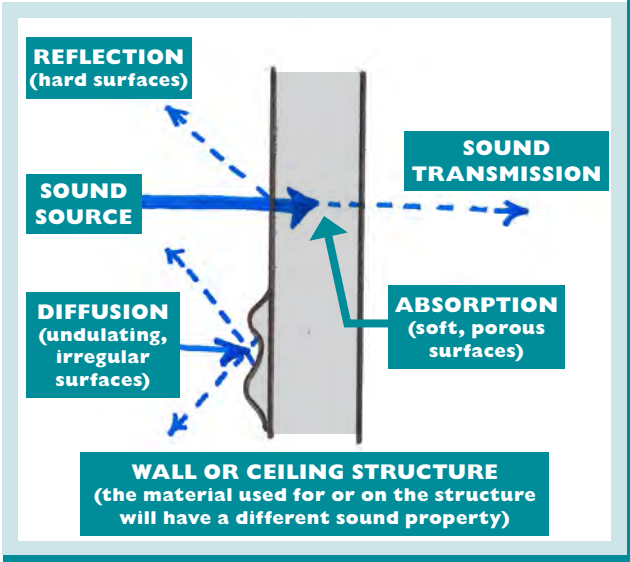
The following items should be considered when *designing a new child care center from the ground up.* Some may add cost to your project, but can be very important in the overall quality of the space. In addition, many items that are useful for acoustical control can also add energy efficiency to a building. Be sure to prioritize acoustical control and discuss these options with your architect during the design process:

- **Use quality exterior building components** to provide increased energy efficiency and help with building aesthetics as well as help provide good acoustic control. Examples of materials to consider include fiber cement exterior cladding, steel stud partition walls with sound absorbing cavity insulation and air sealing around joints, and well-insulated windows and doors with caulking around the seals.

- **Use well-insulated exterior walls** not only to increase a building's energy efficiency, but help buffer exterior noises. Spray-foam insulation in particular is very effective for sound control because it expands within wall cavities, eliminating potential areas for sound infiltration.

- **Install insulated windows** such as double- or triple-paned windows to help to minimize external noise while also contributing to energy efficiency.

- **Use insulated interior divider walls** to help buffer sounds within a space. They are constructed with sound-absorptive batt insulation, extra layers of drywall on the finished surface, an air-space within the wall cavity, or by making the wall a little thicker in depth by offsetting studs or creating a double-stud wall to help to isolate noise.



"The quality of sound in a space contributes significantly to its spirit of place…and sound plays an important role in keeping the body balanced and healthy." – Anita Olds

- **Use full-height walls that extend directly to the underside of the roof or floor above** as opposed to just above the ceiling. This helps reduce sound transmission through the space above the finished wall.

- **Locate the mechanical system appropriately** – both to ensure that it is secured away from spaces occupied by children and to minimize noise. Equipment should ideally be located on a roof, in a basement, in a secure mechanical room, or outside, and on a concrete or neoprene pad to help absorb any vibrations coming from the system.

- **Make sure ductwork is wrapped with insulation** and installed with multiple bends to help diffuse sound.

- **Locate complimentary uses together.** For example, preschoolers shouldn't be playing just outside of infant rooms and rooms that need a quieter environment should be located farthest from the main entry or busy streets.

- **Consider using some absorptive finishes** in spaces where noise may be an issue. Examples of absorptive finishes can be found in the chart on page 49.

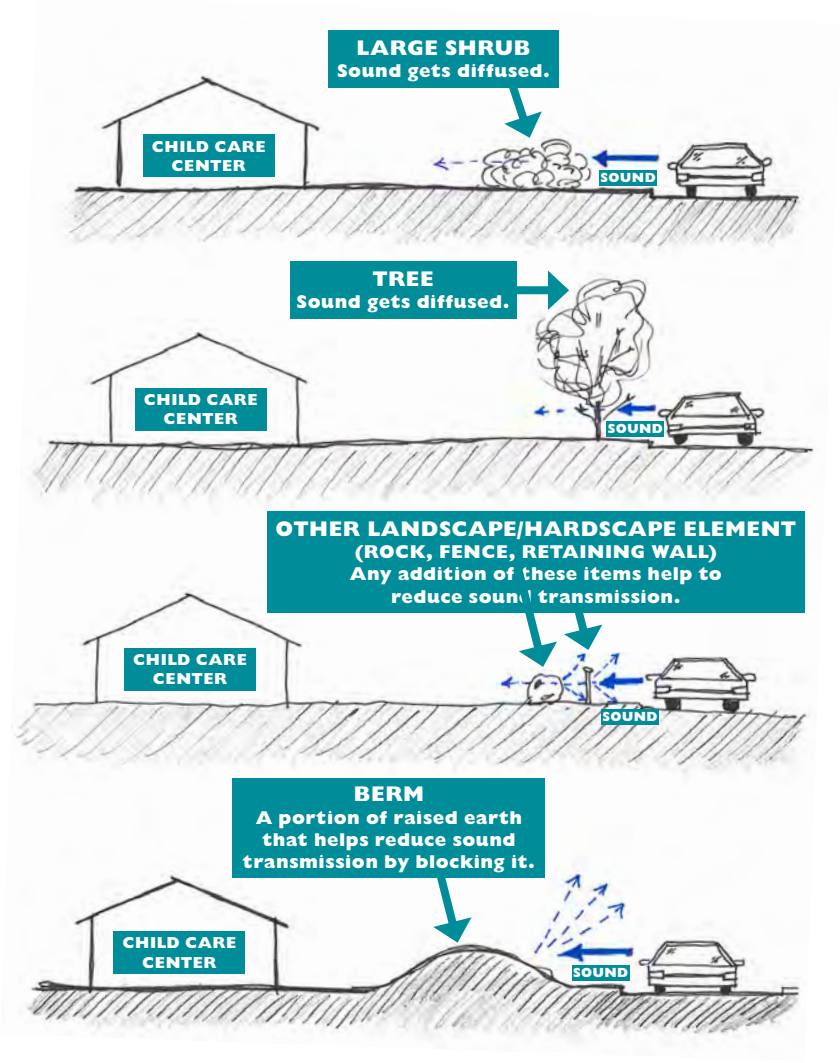
Always check with local building officials before doing any construction work to verify compliance with local building and fire codes.

The classroom pictured above uses a mix of materials and building components to help reduce the level of noise pollution:

1. Homosote (fiber wallboard – similar to a corkboard) panels as art display
2. Soft flooring material to absorb sound
3. Soft furnishings (pillows) located around room
4. Insulated walls that extend to underside of structure above
5. Double-paned glass (double-layered) fishtank which reduces sound transmission

REDUCE NOISE AND IMPROVE ACOUSTIC CONTROL IN AN EXISTING SPACE

Reducing unwanted noise and lowering sound levels is much more challenging in existing spaces. Sometimes despite your best efforts, the issues with noise in a space may be more than a center owner or director can tackle on his/her own. In these cases it makes sense to enlist the help of an architect or an acoustical consultant to help strategize ways to reduce unwanted noise. Adding insulation to walls and ceilings, relocating mechanicals, altering ceiling heights, and adding walls to large open spaces may all be things that need to be considered where unwanted noise is a serious issue. There are, however, a range of modest strategies to improve acoustics that can be implemented without taking on a major construction project:



- **Incorporate exterior landscaping** strategies to enhance your center and provide a buffer to street noise. For example, adding things such as trees, large shrubs, and earth berms as buffers at the perimeter of the lot can create a more dynamic space and will also help to cut down on street sounds. The type of exterior landscaping to use on your site will vary depending on topography, location, size, and budget.

- **Seal around windows** both inside and outside with appropriate caulk. This will reduce the number of air leaks around the frame of the window where outside air may be able to infiltrate. You may also want to do this for additional pest control and weather proofing.

- **Seal any cracks or gaps** in the walls to prevent infiltration. This will reduce the number of air leaks around the frame of the window where outside air may be able to infiltrate. You may also want to do this for additional pest control and weather proofing.

- **Replace windows** with ones that have higher absorptive properties and are well insulated. Reduced sound transmission is only one benefit to adding new windows: they can improve overall comfort with increased energy efficiency (rooms stay warmer in the winter and cooler in the summer), reduce heating and cooling costs (which is also more environmentally friendly), increase the amount of sunlight and view, and are generally more secure than older windows. As windows age there are seal failures, issues with opening and closing, fogging of glass, failure with locking mechanisms, and general decay of material – particularly if they are wood framed.

- **Add absorptive materials.** A room with a plaster ceiling and walls and tile floor will likely be very noisy. Consider covering some surfaces with sound-absorbing materials such as cork, homosote, carpeting, area rugs, acoustical walls or ceiling panels, or soft furnishings. Always remember to check your local fire codes to verify if and which absorptive material are permitted.

- **Add ceiling panels** at varying heights to help dampen sounds. Your architect can work with you to determine what style of ceiling panel would work best with your space by comparing the different ceiling manufacturers and products that are available specifically for acoustical control. Often these panels are made of a solid absorptive material or are a framework wrapped in acoustic material that are hung from the structure above. They are available in many different shapes and sizes. Make sure to work with a contractor and professional installer to be sure any acoustical materials on the panels meet applicable fire resistance requirements and do not block the water discharge of fire sprinkler systems.

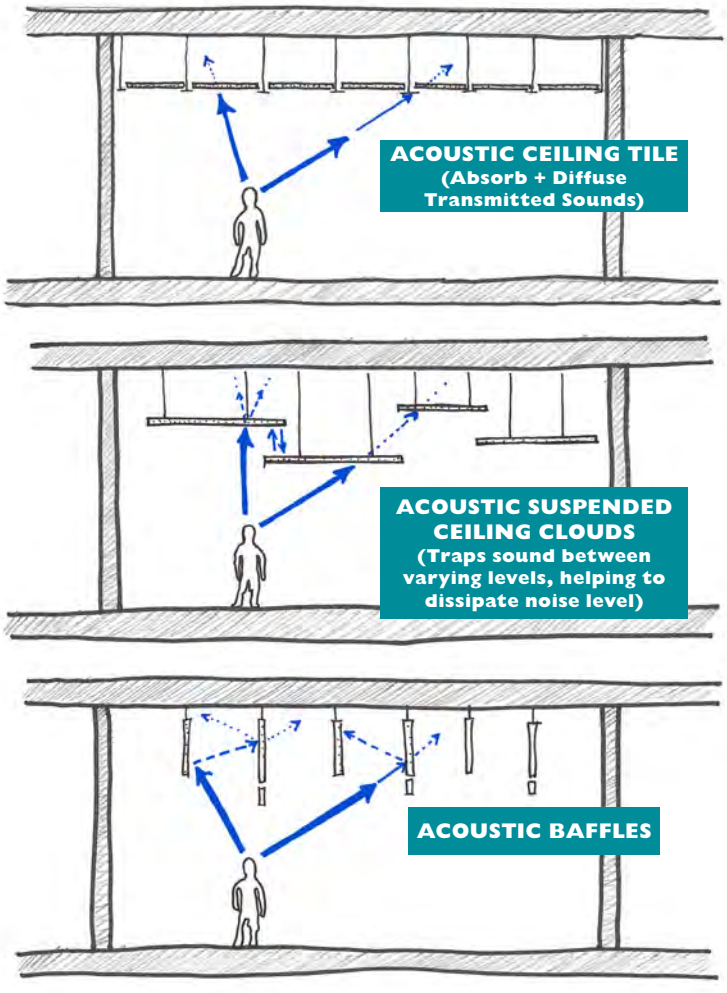
The following diagram illustrates a few of the many ways you can incorporate acoustic ceiling panels:

- **Insulate piping and mechanical ducts.** By wrapping these elements with insulation (usually with urethane rubber pipe insulation or fiberglass duct insulation) the sound of air or water passing through will be dampened. This will also help conserve energy because there will be less heat loss if pipes and ducts are wrapped. Always consult an HVAC or plumbing specialist before adding anything to your pipes or ducts.

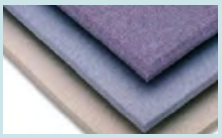
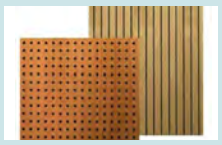
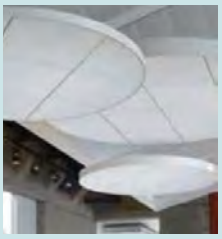
- **Replace humming light bulbs.** Sometimes a humming noise is made when light bulbs are inadequately connected (which could lead to other issues related to the electrical connection) or are at the end of their useful life. Often replacement of a bulb with a new, more energy efficient one can help reduce the humming sounds.

- **Rearrange the furniture layout** and create balance within a space. Often when there is overcrowding noises are heightened. Reconfiguring the spatial layout can be a first defense in spreading out the sounds in a space. There might be multiple circulation paths and play zones so that children can be more evenly distributed and the sound level is dampened naturally.

- **Add furniture of varying heights.** Things like lofts, dividers, and platforms help break up a sound wave's path.

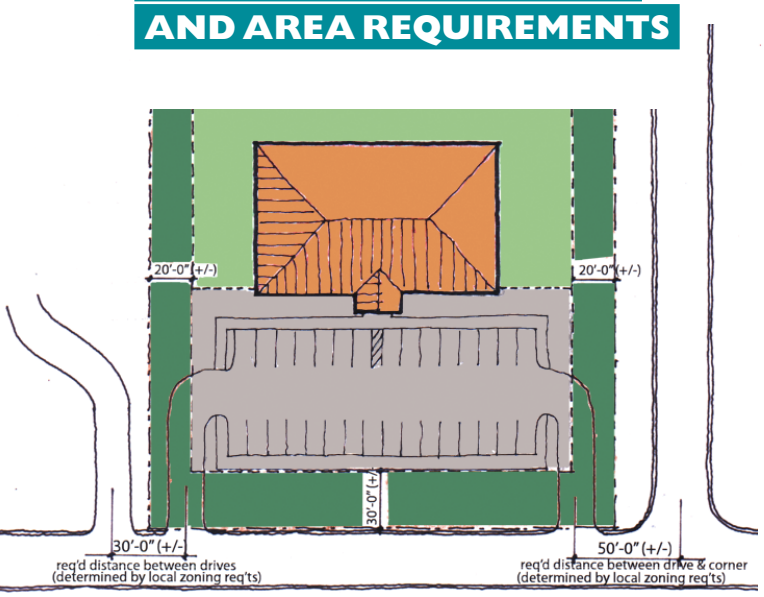


FINISHES: The types of finishes and furnishings used are equally important to help combat unwanted noises by absorbing or dampening sound. The following chart identifies various materials that can be used to help with acoustic control. Before adding any of these materials to your space we recommend consulting with your architect and/or contractor for guidance on purchasing and installation.

TYPE	COST	CHARACTERISTICS	USE	PROS AND CONS	EXAMPLE
ACOUSTIC FABRIC PANELS	$$	Woven fabric with fiberglass.	Generally used on walls.	■ Custom colors and sizes. ■ Professional installation recommended.	
ACOUSTIC METAL/WOOD PANELS	$$$	Perforated or undulating surface.	Generally used on walls.	■ Variety of finishes and surfaces. More natural look and feel. ■ Generally more expensive. Professional installation recommended.	
ACOUSTIC FOAM TILES	$$	Porous material with air pockets to trap sound.	Generally used on walls and ceilings.	■ Variety of colors, sizes, surface patterns, colors, and thicknesses. ■ May need replacement over time.	
FIBER WALLBOARD PANELS (HOMOSOTE)	$	Building sheet material made from recycled paper.	Generally used on walls.	■ Generally inexpensive. Great noise deadening quality. Durable. Can be painted and used as a tack board. ■ Sometimes has a distinct smell from the manufacturing process.	
CORK PANELS	$$	Porous tiles produced from tree bark.	Generally used on walls and ceilings.	■ Can be used as tack board. ■ Lightweight, renewable building material. ■ Deteriorates and needs replacement over time.	
ACOUSTIC SUSPENDED "CEILING CLOUDS"	$$$	Metal framed with stretched acoustically rated fabric.	Generally hung at varying heights horizontally from the ceiling.	■ Variety of shapes and colors available. Provides opportunity for ceiling space to be very dynamic. ■ Decent ceiling height in space is required. Generally more expensive. Professional installation recommended.	
ACOUSTIC BAFFLES AND BANNERS	$$$	Stretched or draped acoustic fabric panels.	Generally hung vertically at varying heights from the ceiling.	■ Variety of shapes and colors available. Provides opportunity for ceiling space to be very dynamic. ■ Need decent ceiling height in space. Generally more expensive. Professional installation recommended.	
SOFT FURNISHINGS	$	Chairs, sofas, pillows, bean bags.	Generally used on floors.	■ Generally inexpensive. Can be relocated and rearranged as needed. ■ May need replacement over time.	
OTHERS SOFT MATERIALS	$	Wall hangings (walls), and carpeting and area rugs (floors).	Generally used on walls and floors.	■ Generally inexpensive. Loose pieces that can be removed and relocated as needed. ■ May replacement over time. Will need consult with Fire Marshal to verify they do not pose a hazard.	

Exterior Site Requirements

PROTOTYPICAL CHILD CARE CENTER SITE PLAN AND AREA REQUIREMENTS



NOTE: This site plan is for representational purposes only. Your site plan will vary based on local needs, ordinances, and site conditions. In particular, site plans for centers located in dense urban environments are unlikely to have substantial space around the building, and will rely more heavily on street parking and use of mass transit, as well as rooftop or terrace playgrounds.

	APPROX. AREA	PERCENTAGE OF SITE
SETBACKS (determined by local zoning req'ts - playgrounds, drives & parking may be permitted by zoning-confirm)	= 16,000 SF	= 35%
BUILDING	= 8,000 SF	= 17.5%
PLAYGROUNDS	= 8,000 SF	= 17.5%
PARKING, DRIVES & FRONT YARD	= 14,000 SF	= 30%
	46,000 SF (approx. 1 acre)	100%

OUTDOOR CIRCULATION AND PARKING

A large portion of most child care center exteriors is taken up by paved surfaces to allow for the movement and parking of vehicles. Typically, vehicular traffic includes staff cars, family cars (for drop-off and pick-up of children), visitors, service vehicles for deliveries and garbage removal, emergency vehicles (infrequent but necessary), and sometimes alternative transportation vehicles like vans and busses.

The layout and sizing of the driveways for all these vehicles is very site-specific and should be designed by a qualified site and/or civil engineer. It is generally desirable to minimize the amount of land used for paved surfaces so that you can maximize the area on the site used for the building and outdoor playgrounds. A good design can help reduce the space for driveways while preserving the project's functional and aesthetic goals.

There are generally two types of parking:

- **Short-term parking** is needed for drop-off and pick-up by parents or guardians, and for use by emergency vehicles. The number of drop-off spots is typically a percentage of the center's total enrollment (for example, one space for every 8-10 children), but the specific requirements for your area should be confirmed with local officials. Drop-off spaces should be located as close as is practical to the front entrance to the building, in order to minimize the walking distance to classrooms, and ideally so that children do not have to cross any vehicular traffic (roads, driveways) to get from the car to the front door.

- The number of **full-day parking spaces** is generally based on the number of staff who drive to work, but may be dictated by local zoning as well. Full-day parking spaces can be located farther from the front door. Some larger centers prefer to have a more remote secondary entrance

just for teachers and staff, which provides more flexibility with site design since full-day spaces take up the largest portion of dedicated parking areas.

Accessible parking spaces are required under the Americans with Disabilities Act (ADA) and must be located as close as possible to the front door.

SERVICE ENTRANCE/ DELIVERIES

Some centers decide to have a dedicated service entrance. There are many advantages to this. If there is a dedicated service entrance, the front entry can be designed for the scale and pace of young children, without worrying about providing space and access for fast-moving delivery people with pushcarts or trolleys.

If the service entrance is remote from the main entrance, it is helpful to have a telephone intercom and/or a security camera so that the receptionist can monitor deliveries and can have a remote door release button at the desk. Ideally the service entrance should have convenient access to the kitchen and related storage areas, without interfering with the children's activities. The location of service entrances and drives should also have minimal impact on outdoor playground spaces and ensure that delivery people do not have to pass through any play areas to reach their entrance.

TRASH COLLECTION

It is important to determine how trash will be collected from the center so that the dumpster enclosure and service driveway can be appropriately sized and configured. It may be possible to put screens around trash dumpsters and service entries so that they are readily accessible from the main drives but are not visible to families coming and going daily.

PLAYGROUNDS

Playgrounds are an often ignored component of the facility design process. It is very common for outdoor areas to be last on the list, with attention paid only if there are project funds left over. High-quality early childhood facilities will utilize well-designed playground spaces as a second classroom for children, and so we encourage careful planning of this space from the beginning of the design process. For detailed information on how to design and equip outdoor play spaces, refer to Volume 4 of this series.

Security

Every center must take all appropriate precautions to ensure the safety and well-being of the children and staff. At the same time, child care programs generally want their centers to be welcoming and inviting. Striking the right balance between security and openness depends on the location of the facility as well as other factors.

ENTRANCE

As discussed earlier in this guide, it is generally ideal for the entry to be a place that welcomes families and visitors and eases the transition from home to your center. However, it is at the center's entrance where you may need to implement security measures to protect your program from unwanted visitors. Ideally, a member of the staff should always be present at the front door. Automated systems, such as key pads with special codes or swipe cards for each family, can also control who enters the building. A second level of security, such as a buzzer controlled by a receptionist or another staff member, can control access from the entry or reception area into the part of the center that houses the children's classrooms.

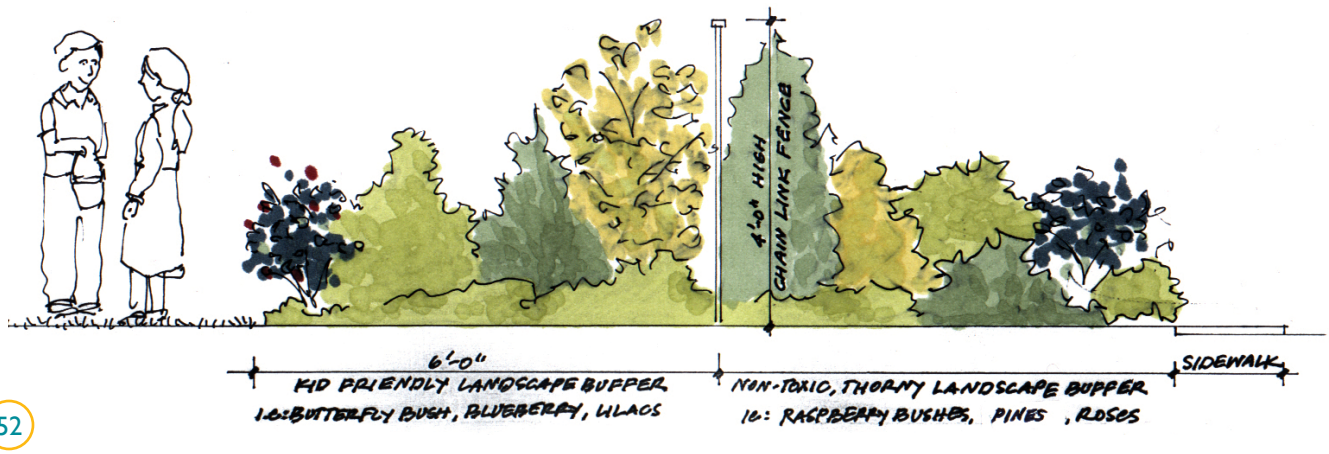
Most centers opt to secure all exterior entrances to the building during operating hours with the exception of the main entrance. Some centers install alarms on the locked doors to provide an additional level of security. At service entrances where the center receives deliveries such as catered meals, you may want to install an intercom and/or camera with a buzzer so that a receptionist or other staff person can provide access.

In some instances, centers with heightened security concerns opt to use a "minimal presence" design approach, that is, deliberately not calling attention to the site as a child care center. In these cases, there is no visible signage or other identifying characteristics of the center from the street. This approach should be used only when there are significant security risks. In addition, these programs should be sure to have a welcoming interior design to offset the discreet and non-child-friendly exterior entry.

FENCING

Some programs need to keep unwanted visitors from gaining access to the children while in the playground or from using their outdoor playspaces after hours. The usual approach is to install very high, often unappealing, fencing. The following images show two alternatives.

BELOW: *A relatively inexpensive approach uses interesting plantings to liven up an otherwise unattractive chain link fence. When using this approach consider planting thorny shrubs on the street side of the fence and child friendly and appealing plantings on the playground side.*



BELOW: *Some playgrounds have budgets that allow them to design very creative fences that provide security but are also an attractive and fun addition to the environment.*

WINDOWS

In rare circumstances, such as a center occupying a storefront space, children and teachers may feel too exposed to pedestrians staring into classrooms. In these cases glass blocks, as shown below, allows natural daylight to enter the space without allowing people to view the center from the street.

It is highly desirable to have operable windows that allow fresh air to circulate in the classroom on nice days. However, precautions must be taken to ensure that children cannot climb or fall out of the windows. Any windows at child height should open from the top only, to prevent a child from climbing out or someone outside from crawling in.

"Some programs are in unsafe areas where residents live with the reality of violence and homelessness; others may be at real risk from terrorism or other elements that raise realistic fear. In these programs, reduced visibility to the public and strong security measures make sense. But for most programs, the real potential for harm comes not from horrible strangers but angry or distraught people connected with the program – workers, ex-workers, spouses, boyfriends, or parents. A single, secure entrance makes sense, as does attention to restricting playground access. But the real security comes from a sense of community and knowing and caring about others. The actual incidence of stranger harm in child care worldwide is infinitesimal. Nearly all violence has come about because of adult relationships gone horribly wrong. Design and program practices that promote community are a key element in good security."

Jim Greenman,
Caring Spaces, Learning Places.

Special Considerations for Urban Sites

While this guide is intended to be applicable to all types of settings, there are some special considerations that may be particularly relevant to densely populated urban locations.

BUILDING REUSE

In urban environments where land and space are usually scarce, you are more likely to renovate an existing structure for child care use than build a new one. Using an existing building often means you will be faced with size and layout constraints; the possibility of structural damage; and even the presence of hazardous materials. Therefore, it is important to carefully evaluate an existing building to ensure that it will be well suited to the unique characteristics of child care space. The site assessment checklist in Volume 1 of this resource guide series, on developing child care facilities, will help you with this task.

PARKING

In many urban areas, it can be challenging to find a location that will accommodate all of your ideal site requirements, such as dedicated parking. Many families who use child care centers in urban areas rely on public transportation rather than cars, but reliance on public transportation in some locales is simply not practical. Where parking is scarce, some centers get city approval to provide a special 15-minute parking zone in front of the building during the morning and evening drop-off and pick-up times. These logistical challenges are the reason that some urban programs make efforts to locate their facilities in the neighborhoods where the majority of their families reside, allowing most of the center's users to walk to the site.

Fortunately, some urban areas do have good public transportation services that parents and staff use. When this is the case, it is important that your site selection criteria include proximity to transit stops and that your initial feasibility assessment determines whether parents will be likely to use public transportation. For staff and visitor parking, explore the possibility of leasing parking spaces from nearby property owners who may not need all of their spaces or who may need them at different times of the day. Finally, it is important to note that many cities include minimum parking requirements in their building and zoning codes. These types of requirements should be verified in advance of selecting a site.

PLAYGROUND

Site constraints should not deter you from providing critical outdoor experiences for children. In an effort to provide ample access to outdoor play, many programs in urban areas have successfully utilized rooftop and terrace spaces to create wonderful playground areas.

Typically many urban playgrounds are built on asphalt surfaces with little natural greenery. Incorporating vegetation such as planters, gardens, trellises, and trees can be an effective way of softening an urban playground.

LEADING EARLY CHILDHOOD EXPERTS ARE CONCERNED ABOUT THE LACK OF TIME CHILDREN SPEND OUTDOORS INTERACTING WITH NATURE AND DESCRIBE THIS ISSUE AS "NATURE DEFICIT DISORDER."

The organization Playing for Keeps (www.playingforkeeps.org) cites the following data:

- *Unstructured outdoor activities have declined by 50 percent compared to the previous generation.*
- *More than 80 percent of children under age 2 and more than 60 percent of children ages 2-5 do not have access to daily outdoor play.*
- *The average American home with a toddler has the TV on six hours a day.*
- *The average 2-year-old spends more than four hours a day in front of a TV or computer screen.*

This move away from natural experiences comes at the same time that research increasingly shows a strong linkage between interactions with nature and decreases in obesity, depression, and attention deficit disorder in children. In addition, there is strong evidence of a linkage between environmental education and increased ability to think creatively, problem solve, and make decisions. In urban settings, where children are even less likely than their suburban and rural counterparts to have opportunities to interact with nature, it is critical to consider features in the design of your child care center that allow children to experience the outdoors – both by creating innovative outdoor play spaces and by incorporating natural elements in your interior design.

NOTE: Additional resources and useful background information and resources on nature deficit disorder and other related topics can be found at www.nwf.org/greenhour.

NATURAL LIGHT

Beyond the window security considerations discussed in the previous section on Security, special thought may need to be given to how to maximize natural light in urban settings. Some centers in dense areas are bound by buildings on several sides and windows sometimes face brick walls, limiting the amount of natural light flowing into the classrooms. There may be only one exterior wall facing the street, and in certain neighborhoods it may be preferable to obscure views into the center and out to the street. One strategy to admit daylight but limit views is to use glass block windows as described in the previous section. This type of setting may also call for more internal windows that allow children and staff to have views into neighboring classrooms or hallways, and encourage a more open and less claustrophobic feeling in their space. Another approach is to use skylights to allow daylight to fill interior spaces. Finally, when natural light is scarce, architects should give special attention to introducing different types of artificial lighting and interesting colors on the walls and floors to help brighten the space. It is important to note that these strategies should be the exception rather than the rule. Whenever feasible, children's' classrooms should have windows that provide natural light and the opportunity for children to view the outside world.

Materials, Systems, and Accessibility

EXTERIOR MATERIALS

Exterior building materials play an essential role in communicating the overall character of a building, and should be selected very carefully. For child care centers, the scale and tactile quality of the materials are just as important as the aesthetics because of how the building will be used. Children will have more physical interaction with the exterior walls of a child care center than people will have with most other types of buildings. The playground space is often adjacent to some of the center's outside walls, and even when entering or leaving the building children will frequently touch or bang on the building's exterior. For example, creative spirits may find that an outside wall is a great palette for artwork, rendering in chalk, paint, mud, or any other material. Dragging one's fingers or a stick across a rough brick wall or cool metal panel can be a source of discovery and delight for a child.

The options for exterior finish materials are extremely varied in appearance, price, and durability. An ideal exterior building material will be easily cleaned and child-safe. As with any material choice for children's spaces, care should be taken to minimize sharp edges and corners. Often, very durable materials (such as brick) are more expensive than other options at the time of construction but hold up better and have lower maintenance costs over time. Since child care centers often have limited budgets for ongoing maintenance, paying more up front for highly durable materials may be a very wise investment. When cost is a key factor, consider using a very durable material such as brick on the bottom and a less expensive material such as wood shingles or vinyl siding on the upper part of the wall, which is not likely to see as much wear and tear from young children.

For those who would like to have a residential feel to their buildings, wood siding materials – such as clapboards or shingles – quickly come to mind, but they may not always be the best choice. Wood siding is readily available and easy to install but requires frequent repainting, which can be costly.

It is also important to note that many building and fire codes prohibit the use of combustible materials such as wood for child care centers. Your architect should determine what code limitations there may be with regard to exterior finishes of the center in the early design phases. Noncombustible alternatives to traditional wood siding include vinyl siding, monolithic systems (such as stucco or EIFS/synthetic stucco), and fiber-cement board systems.

INTERIOR MATERIALS

As with many choices in child care design, the selection of the ideal materials for interior spaces is a careful balancing act. Characteristics such as durability, aesthetics, and cost should be considered along with how the material will enhance the experience of children using the center.

FLOORING

Typical child care center flooring often consists of vinyl tile with some built-in or area carpeting. Durability is key, but there are many other things to consider. Kids sit, lie, roll over on, scratch, sniff, and pour liquids onto child care center floors. Consider using flooring materials with finishes that are more interesting to the touch and provide some design opportunities such as linoleum and carpet squares which can be laid in different visual patterns. But a word of caution: while well-planned patterns using one or two additional colors sprinkled in can add visual interest, using too many colors or making it too busy can create a look that is visually distracting for children. Natural flooring such as cork or wood also provides great flooring options since it is easy to clean and refinish and bring a natural warmth to the space. Some basic flooring types include:

- **Vinyl composite tile (VCT)** is often used for most of the classroom activity areas. It is inexpensive to install, relatively durable, and requires conventional maintenance. Installed correctly, it withstands water (even at the joints), abrasives (like sand), and impacts with minimal damage. If properly waxed, it tends to resist stains and other damage from spills. Individual tiles, if cracked or broken, can also be replaced without having to replace the whole floor. On the other hand, it is not a particularly soft surface, especially since it is often installed directly over a concrete slab. The economical versions come in a limited color and pattern range, although interesting variations can be achieved by mixing different colors.

- **Sheet vinyl** is typically used in areas that are likely to get wet more frequently such as toilet rooms or art areas. Since the material is laid from rolls, there are fewer joints and therefore it can be more effectively sealed.

- **Carpeting** is often used for large portions of activity areas, nap rooms, and common corridors and other public spaces. It is a good idea to install the carpet over a pad, particularly in rooms with the youngest children. Specific types of carpeting selected depend on many factors, including softness to the touch, durability and stain resistance, anti-microbial and other health-related qualities, and cost.

Walls are a canvas for creative expression and a laboratory for experimentation.

A strategy that many providers have adopted and found to be viable involves finishing an entire room with VCT, wood, or another type of durable flooring and then installing area rugs of varying sizes. This allows for flexible arrangements of activity areas and can be cost-effective since economical area rugs can be replaced at less cost than maintaining more expensive versions that are installed.

- **Ceramic tile** can be great for wet areas, and can add considerable visual and tactile interest to the floor (colors and textures are infinite). It is extremely important to seal the grout if using ceramic tile and to understand that this can be a difficult product to maintain due to staining of grout lines, potential cracking of tiles, etc.

- **Wood flooring** is likely to be more expensive to install up front, but this trade-off may be well worth the benefits since they can be easily sanded down and refinished. They are easy to maintain and they provide a great backdrop for the array of colors in children's toys and furnishings.

- **Cork flooring** is more resilient than most types of classroom flooring. It adds warmth and texture to a space, offers many health advantages in that it is anti-microbial and resistant to mold and mildew, is considered a renewable resource, and is fairly economical to install. It is also a surface that is comfortable to stand or sit on for long periods of time. However, cork flooring needs regular maintenance to preserve its original appearance and is not ideal in areas that may get wet frequently.

WALL MATERIALS

Wall surface materials vary widely in children's environments. Again, the finishes that are the least expensive to install up front can be the most expensive to maintain over time. Beyond cost, there are many other considerations for vertical surfaces in children's spaces. Painted drywall is fine for office and meeting spaces, where most contact will be from someone occasionally leaning against the surface. In child care center classrooms and corridors, however, walls are a canvas for creative expression and a laboratory for experimentation. Paint often needs to be reapplied every year. Better solutions are vinyl wall covering, or better yet, a combination of surfaces that can actually enhance the program, such as white board for drawing and painting, a mirror for self-discovery, cork board for displaying children's projects, carpeting to attach Velcro objects to, or any number of other durable and interesting surface materials. A strategy that can both save cost and provide additional interest to the space is to install a chair rail halfway up the wall. This way, the wall above can be painted drywall, while the space below where children can reach and touch can be made up of more interesting and durable surfacing.

CEILINGS

Typical commercial ceilings are finished with acoustic ceiling tiles (or ACT) set into a metal grid suspended from the structure above. This allows office buildings to efficiently install fluorescent lighting, air conditioning equipment, sprinkler heads, exit signs, heat and smoke detectors, fire alarm lights and horns, emergency lighting, speakers, and so on. Unfortunately, these types of ceilings promote a more commercial and institutional feel. Also, these ceiling tile systems are designed to be installed at a uniform height. While the systems management and acoustical qualities can be appropriate to child care, a far more interesting classroom space can be designed by using varying ceiling heights and materials to visually divide the classroom into smaller zones and activity areas. When considering ceiling options also think about the types of lighting you may want to install.

If you are renovating a building that has very high ceilings consider some creative strategies for lowering the ceiling height, other than merely installing a typical drop ceiling. Pendant lights can create the illusion of a smaller scale. A small section of suspended ceiling in a whimsical shape can also provide interest to the space while achieving the goal of decreasing the volume of the space.

CLASSROOM MATERIALS

When selecting classroom equipment and materials, many factors should be considered along with cost. Selecting higher quality furnishings for the classroom may cost more initially but will undoubtedly reduce maintenance and replacement costs over time. In addition, providing well-designed and aesthetically pleasing furnishings and materials will help to support program quality by improving the overall classroom environment. Although the furnishings and equipment will largely be placed into the classroom once construction is complete, it is important to think about the types of furnishings and equipment you will use early on in the process in order to ensure a harmonious blend of materials within the classroom setting. Refer to the Equipment and Furnishings Guide, Volume 3 in this series, for additional information on this topic.

CLIMATE CONTROL AND BUILDING SYSTEMS

- **Heating systems.** Often the simplest way to provide heat is from a radiator or through hot air blown from diffusers in the ceiling. Unfortunately, neither of these is best for child care. Radiators can pose a burn hazard for children's exploring fingers, and they tend to occupy valuable space at the exterior walls where children want to approach the windows. Blowing hot air from above is also problematic, since it often does not evenly reach the lowest three feet of space where children and caregivers spend most of their day. A better solution is to have radiant heat in the floor, where gentle, evenly distributed heat makes the floor a comfortable place to be in the winter time, particularly near the outside walls. This is a wonderful feature for both the young children and their teachers who spend so much time every day sitting and playing on these floors. Although it is somewhat more expensive to install, radiant heat is more cost-efficient to operate and so will help to reduce heating costs over time.

- **Cooling.** Child care centers, unlike schools, operate year-round. Central air conditioning is a critical building component in any child care project.

In the case of both heating and cooling systems it is extremely important to plan for separate zones within the space. Ideally each classroom will be able to control the individual temperature of its room.

- **Fresh air/ventilation.** It is ideal to have the ability to bring fresh air into the child care center. If the building has or will have operable windows, consider how these windows can be opened safely to allow fresh air into the space. This may mean installing windows that will open from the top or open out in a way that prevents curious children from climbing out. If the building will not have operable windows, or in climates where windows can't be kept open year-round, a mechanical ventilation system should be installed to ensure the ability to circulate fresh air through the space.

- **Electrical systems.** Carefully planned electrical systems and installation of electrical outlets in the classrooms will help teachers provide quality programming. Some of the newer electrical fixtures have built-in covers that eliminate the need for small plastic outlet covers which are frequently lost. Placement of outlets at higher than typical levels will also help to keep inquisitive little fingers away from them and will enable teachers to plug in CD or tape players without dangerously draping cords.

ACCESSIBILITY

The term "accessibility" as it relates to buildings is used to describe the requirement to make a building readily accessible and usable by individuals with disabilities. The regulations that govern accessibility are extremely complex, so it is critical that your project architect identify all of the requirements that must be met by your individual facility and program early on in the planning and design process so that they can be incorporated into the project. There are a few key points to keep in mind:

- The federal law which governs facility accessibility is referred to as the Americans with Disabilities Act (ADA) of 1990. It is enforced by the U.S. Department of Justice and includes sections that apply both to the public sector (Title II) and the private sector (Title III).

- In addition to federal regulations, many states and local governments have their own regulations in their general laws or building codes. These requirements do not replace federal requirements but rather supplement them. Therefore it is critical that your architect not only consider federal requirements but also incorporate any local regulations into the planning.

- New construction is held to a different standard than renovation in relation to ADA requirements:

    - New buildings must fully comply with federal accessibility laws.
    - Existing public accommodations, including child care centers, are required to remove architectural barriers to accessibility even when no alteration work is planned as long as such removal is "readily achievable."
    - Any alterations to an existing building must be made so that the altered portions will be accessible to individuals with disabilities to the "maximum extent feasible."

As you can see, all of these requirements are subject to wide degrees of interpretation by the regulatory bodies.

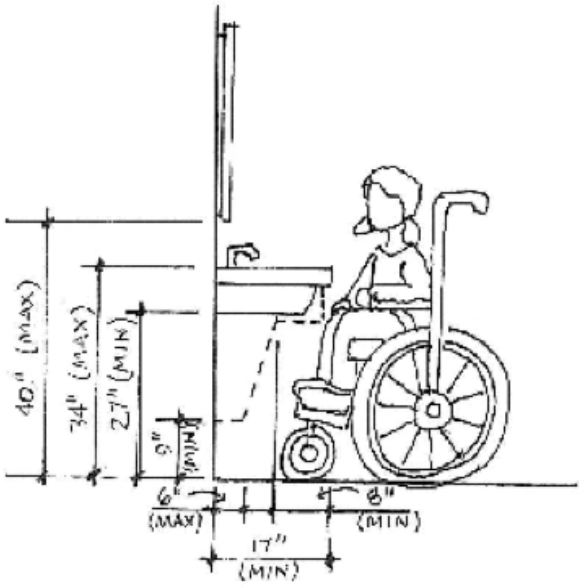
CHILDREN AND THE AMERICANS WITH DISABILITIES ACT (ADA)

Most of the regulations within the ADA apply to both adults and children but earlier versions of the ADA standards did not include dimensional specifications for children. The 1998 edition of the ADA Standards was modified to include specifications for specific building elements based on children's dimensions.

The current child-specific ADA requirements outlined in the *2010 Standards for Public Accommodations and Commercial Facilities Title III* apply to children aged 3 through 12 and include reach ranges for elements such as coat hooks and lockers, mounting heights and clearances for drinking fountains, sinks, toilets/toilet stalls, and handrail mounting dimensions. This helpful resource can be accessed via the following web link: http://www.ada.gov.

SINK CLEARANCES

The clearances for accessible sinks for children are the same as for adults so children who use wheelchairs can use the adult accessible handwashing sink. The following is a diagram that illustrates the required knee and toe clearances that are required per the ADA:



For lavatories and sinks used primarily by children aged 5 years and younger, a parallel approach (30" x 48") to the sink is also permitted.

WHEN RAILING/HANDRAILS ARE NEEDED

The ADA regulations include specific requirements for changes in floor levels.

RAMPS

All level changes that are 1/2-inch or greater must comply with ADA requirements for ramps. For new buildings, the change in level must have a slope of no more than 1:12 and is limited to a maximum ramp rise of 30 inches. For existing sites and buildings, ramps are permitted to have running slopes steeper than 1:12 where steeper slopes are necessary due to space limitations:

SLOPE	LIMITATION
Steeper than 1:10 but not steeper than 1:8	Limited to 3-inch maximum rise
Steeper than 1:10 but not steeper than 1:8	Limited to 3-inch maximum rise

If a ramp run has a rise greater than 6 inches or a horizontal projection greater than 6 feet, then the ramp is required to have handrails on both sides.

STAIRS

All stairs are required to have handrails on both sides.

Even where facility accessibility is not currently required by law, it is generally wise to incorporate as many features as possible in order to ensure future compliance and to provide as much accessibility as you can for the children and families who use your center.

Facility Design Resource Materials

PUBLICATIONS

Caring Spaces Learning Places: Children's Environments that Work by Jim Greenman: Exchange Press, 2005
Available at: www.childcareexchange.com

Child Care Center Design Guide, U.S. General Services Administration, Public Buildings Service Office of Child Care, 2003
Available at: www.gsa.gov

Child Care Design Guide by Anita Olds, NY: McGraw Hill, 2001
Available at: Most major book sellers

Designs for Living and Learning by Deb Curtis and Margie Carter: Redleaf, 2003
Available at: NAEYC www.naeyc.org

Early Learning Environments that Work by Rebecca Lsbell and Betty Exelby: Gryphon House, 2001
Available at: www.ghbooks.com

Head Start Design Guide: A Guide for Building a Head Start Facility: 2006
Available at: www.headstartinfo.org/publications/designguide

Landscapes for Living and Learning: Designing Group Care Environments for Infants and Toddlers by Louis Torelli and Charles Durrett
Available at: www.spacesforchildren.com

Places for Childhoods: Making Quality Happen in the Real World by Jim Greenman: Exchange Press, 1998
Available at: www.childcareexchange.com

Removing Barriers to Childcare Facilities Development by Gretchen Lee Anderson, Ph.D. and Dianne L. Philibosian, Ph.D.: University of Berkeley, 2003
Available at: www.designchildcare.com/book.html

WEB LINKS

Child Care Information Exchange
Articles and publications on a variety of topics related to the development of quality environments for young children:
www.childcareexchange.com/search/index.php?search=physical+environment

Consumer Product Safety Commission
(CPSC) Child Care and Playground Safety Guidelines:
www.cpsc.gov/cpscpub/pub/pub_idx/html

NAEYC
Print and Online Resources on Environments That Support Exploring, Learning, and Living:
www.journal.naeyc.org/btj/200505/06Resources.asp

Information on national accreditation guidelines is available at: www.naeyc.org/accreditation/

National Child Care Information Center
Resources on child care facility design and development:
http://oll.nccic.acf.hhs.gov/nccic-OLL/searchnccic.cgi

National Clearinghouse of Educational Facilities
Early Childhood Design Resource List:
www.edfacilities.org/rl/earlychildcenters.cfm

National Program for Playground Safety
Information on the development of a safe playground:
www.playgroundsafety.org

The Natural Learning Initiative at North Carolina State University
Information and resources on the importance of the natural environment in the lives of children:
www.naturalearning.org

APPENDIX: ABC CHILD CARE CENTER SAMPLE SPACE PROGRAM

PROJECT # 7000.02			DESIRED						
Room Type	Capacity/ Room	Ratio	Ages	SF/room (activity area)	SF/child (activity area)	# of Classrms	Total SF	Total Capacity	# of Teachers
CLASSROOMS									
Infant	6	2 to 6	6 wks - 12 mos	360	60	2	720	12	4
Young Toddler	10	2 to 10	12 mos - 22 mos	600	60	1	600	10	2
Older Toddler/Transition	12	2 to 12	22 mos - 36 mos	600	50	2	1,200	24	2
Young Preschool	16	2 to 16	2.9 yrs - 4 yrs	800	50	2	1,600	32	2
Older Preschool	18	2 to 18	4 yrs - K	900	50	1	900	18	2
Gross Motor	18		N/A	1,350	75	1	1,350		
Subtotal				4,610		9	6,370	96	12
CLASSROOM SERVICES									
INFANT									
Storage Closet				15		2	30		
Cubbies				9		2	18		
Food Prep				10		2	20		
Teacher Workstn.				10		2	20		
Changing Station				40		2	80		
TODDLER									
Storage Closet				15		3	45		
Cot Storage				15		3	45		
Cubbies				9		3	27		
Food Prep				10		3	30		
Teacher Workstn.				10		3	30		
Toilet/Changing				30		3	90		
PRESCHOOL									
Storage Closet				15		3	45		
Cot Storage				20		3	60		
Cubbies				6		3	18		
Food Prep				10		3	30		
Teacher Workstn.				10		3	30		
Toilet/Changing				26		3	78		

ABC CHILD CARE CENTER SAMPLE SPACE PROGRAM *(continued)*

PROJECT # 7000.02			DESIRED						
Room Type	Capacity/ Room	Ratio	Ages	SF/room (activity area)	SF/child (activity area)	# of Classrms	Total SF	Total Capacity	# of Teachers
GROSS MOTOR									
Storage Closet				50		1	50		
Toilet/Changing				60		1	60		
Subtotal							806		
ADMIN. & SUPPORT									
Entry Vestibule				50		1	50		
Lobby				150		1	150		
Director Office/Admin.				250		1	250		
Conference Room				300		1	300		
Staff Break Room				200		1	200		
Staff Resource/ Work				250		1	250		
Parent Resource				150		1	150		
Nurse's Office				150		1	150		
Kitchen				200		1	200		
Laundry Area				80		1	80		
Adult Toilet Rooms				100		1	100		
Mechanical Area				250		1	250		
Janitor Closet				75		1	75		
Storage				200		1	200		
Service Entry				75		1	75		
Subtotal							2,480		

SUBTOTAL (USABLE AREA)	**9,656**
Circulation	1,931
Interior Walls/Shafts, etc.	966
TOTAL INTERIOR AREA	**12,553**
Exterior Walls	1,004
TOTAL GROSS BUILDING AREA	**13,557**
TOTAL GROSS SQ. FT. PER CHILD	**141**

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