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# A Model School in Massachusetts: Preschool, Kindergarten, First Grade

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# **A MODEL SCHOOL IN MASSACHUSETTS**

**-PRESCHOOL, KINDERGARTEN, FIRST GRADE-**

**Independent Project submitted to:**

**Roger Williams University, School of Architecture, Art and Historic Preservation**

**In fulfillment of the requirements of the B.Arch Degree in Architecture;**

**In May 2008**

**By:** \_\_\_\_\_

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**A MODEL SCHOOL IN MASSACHUSETTS:  
-PRESCHOOL, KINDERGARTEN, FIRST GRADE-**

**ROBIN NICHOLS  
MAY 2008**



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# PROJECT ABSTRACT



I am proposing a school in Medfield, Massachusetts using the existing site of the Kindergarten in the town. The first part of the proposed project is to master-plan the site for better on-site parking, bus drop-off areas, and a better connection to the neighborhood. Secondly, the school will be rebuilt to provide for the new state-mandated Pre-School and Kindergarten programs. In addition to those programs, the building will also need to provide classrooms for First-Grade students for the town of Medfield. This school will be a model for the future of the educational system in Massachusetts.

This school will provide students with a healthy learning environment that enforces proactive learning. It will allow for a variety of learning activities and play, a variety of spaces for independent and group activities, and overall freedom for the students. Also, the school will be flexible for whatever changes occur in the users and activities in the spaces over the life of the school. The building will be planned to maximize the amount of fresh air and sunlight to lessen the dependence on artificial light and HVAC systems.



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## CHAPTER 1: PROBLEM & PROJECT STATEMENT



Currently around the United States, Pre-School is becoming mandatory, and Kindergarten is becoming a mandatory full-day program. Massachusetts is one such state which is passing through legislation for mandatory Pre-School and full-time Kindergarten programs. Schools around the state are already overcrowded and wholly unprepared for the increase in students.

One such town is Medfield, Massachusetts. Medfield has one of the states' best school systems (which is where I am proud to say I went). It is a model school in the area and therefore a good school to update for the upcoming state-mandated programs. The outdated Memorial School (pre-k through First Grade) only has enough classrooms for the state's mandatory half-day Kindergarten, two preschool classes, and the first grade classrooms. Another major problem for Medfield's school system is the terrible planning of the site which also has the original town High School which is now an Elementary School with multiple additions that barely keep up with the schools needs. There is hardly any parking for both schools, and the Dale Street Elementary School does not have sufficient space for a bus drop-off area.

I am therefore proposing a phased master-planning project. The first phase of the project, which I will be designing' is the redesign of the Memorial School and Dale Street school site. Master-planning is needed to provide accessible on-site parking for all employees, to develop the site in a way which takes advantage of natural sunlight, to provide an on-site bus route and drop-off area for both schools, as well as to provide more appropriate planning for a site within a residential area. The second phase of the project will be to redesign the Memorial School to provide for the state-mandated programs along with the First Grade from the previous program for Memorial School. Based upon the town demographics, the school will provide classrooms for two hundred First-Grade students, two hundred Kindergarten students, and two hundred part-time Pre-School students.

The new Memorial school should relate to the user, it should also fit their changing needs at all phases of their education, as well as empower the students to be more involved in the built environment; this is especially important with younger child development. Architecture can provide children with a sense of place in the world, it can make them feel important and allow them to participate in creating space for their own needs. It can empower them and help encourage them to participate in shaping the world.

This project will provide a safe place for children to learn, play, socialize, interact with adults, and grow!





## CHAPTER 2: ARCHITECTURAL INTENTIONS



Architects have an obligation, that is, a responsibility to provide for the needs of a user for any space. This space must be a safe place first and foremost. Secondly, architects must resist imposing themselves with the interior. Creating a proper space with a proper enclosure is how we affect people's lives and it is our responsibility to provide the best we can for their needs. Aside from the space we create, we change the exterior environment/context with the style of what we create and its placement upon the site. Architecture should be a continuum of its immediate context within a neighborhood or natural site. The architect needs to be respectful of the community by designing an appropriate exterior.

The architect plays only a few roles in the creation of architecture. The site partly dictates what is built and how it is built, what materials are used, and its form. The users also have a part in deciding the typology of a building, the materials and spaces created based upon their needs from program. Architects help decide the form and space created through enclosure and structure. They set the framework for how a space is to be used. Architects also have the very important obligation to get the users and community involved in the project for it to be successful.

Local ecology is also plays an important role in the creation of architecture. It provides insight into what materials are to be used, the connection of building and the ground, and the processes for construction. The ecology of any place is very important to the identity of any locale. If the architect respects the ecology of a site, then so will the users. Architects set trends in how they build upon land, therefore, they should take into careful consideration their influence on the community.

In a global environment, people need to have a strong sense of place to stand up against the flood of new and emerging technologies, cultures, ideas, and trends. Architecture can provide a strong sense of place and therefore help people keep their identity within a community. Architects have the responsibility to provide people with a flexible space which is defined, yet always changing with the needs of the user. the grade-levels based upon population growth. Therefore, the classrooms and social spaces need to be adaptable for a variety of users and activities.

## ARCHITECTURAL INTENTIONS [CON'T]



**With regards to the proposed school, the major architectural themes/intentions are as follows:**

- Flexibility of interior/exterior space,
- Visual Connection with neighborhood and Dale St. School,
- Continuity of space between interior and exterior,
- Safe use of materials/ tectonics for children,
- Plenty of natural light and ventilation/fresh air.

Flexible spaces are extremely important since the classrooms and social spaces will constantly be used for a variety of different activities. Schools also constantly shift the grade-levels based upon population growth. Therefore, the classrooms and social spaces need to be adaptable for a variety of users and activities.

In order to provide a pro-active learning facility which encourages students to be involved, the spaces need to be scaled for all users. Furniture, appliances, and hardware need to be accessible for younger children, adult employees, and handicapped accessible as prescribed by the ADA.

Schools often close students off from the exterior environment, fresh air, and natural sunlight. Classrooms often have no relationship with the site and do not offer the opportunity for students to learn in a healthy environment. Flexibility of the interior spaces depends on their connection with the exterior and the ability to use the exterior environment as part of the learning environment. A classroom's size can be increased if there is a smooth transition from interior to exterior space. Most importantly, students should not feel completely enclosed by the classroom.

The most important architectural intention is to provide a safe facility through the use of materials and tectonics of building systems which are non-toxic, durable, and without sharp corners, edges, or small parts which can be a choking hazard. The ability to clean surfaces is also important for choosing the interior materials, furnishings, and appliances.

Regardless of building type or use, all buildings should take into consideration natural resources. The use of fossil fuels and production of non-recyclable waste can be greatly decreased by using passive systems of heating and cooling, as well as by taking advantage of natural sunlight. A variety of passive systems will be investigated for this school.

## CHAPTER 3: TECHNICAL INVESTIGATION OUTLINE



### STRUCTURE

Based upon the regulations for educational facilities, a non-combustible frame should be used. Concrete (poured or pre-cast) is the best option for the main structure while steel is a good material for secondary structure. A modular system of steel however, will be used due to the time constraints of a school project, since steel is quick to assembly.

### ENCLOSURE

There are no current regulations on the use of materials for exterior cladding in the town of Medfield. While the town is mainly wood clapboard siding and brick veneer, any material can be used. Plenty of glass shall be used along with any variety of opaque materials. Due to the cold and windy winters of New England, along with the hot, humid summers, the enclosure system needs to be flexible, durable, and weather resistant. Due to the weather, wood should be avoided, however, brick can be used for its durability but also to fit into the context.

### MECHANICAL/HVAC SYSTEMS

Since the building will have several uses, zoning of an HVAC system is required. Built-in wall air-conditioning units take up usable floor space so an overhead system will be best. To avoid over-use of the air-conditioning system, passive cooling systems shall be taken advantage of in classrooms. Plenty of ventilation and fresh air is imperative for children to prevent spread of germs and accumulation of carbon dioxide which is a common problem in today's educational facilities.

### INTERIOR MATERIALS/FORMS

Due to the large volume of young children, a safe interior is a top priority. Sharp corners and small crevices should be avoided, surfaces should be easy to clean, and non-toxic material that cannot be broken into small pieces (e.g. Carpet fibers can be consumed) should be used. Electrical outlets and mechanical components shall not be within reach of the students. To avoid noise transference which can distract children, acoustical insulation between classrooms and halls is needed. Hard materials should be avoided in all spaces as they transfer sound and are not safe for children. Comfort is very important for children!



## CHAPTER 4: CLIENT AND USERS



### **CLIENT:**

The client for this proposed project is the Medfield School Board. It is comprised of several community members, including Robert Maguire, the Superintendent of Public Schools in Medfield.

**“The unfolding of events in a literary context inevitably suggested parallels to the unfolding of events in architecture.”**

**-Bernard Tschumi**

### **User Narrative- Teacher:**

I woke up this morning knowing that I had a long day ahead of me. I got ready for work and got in my car. It was a short ride across town, I drove through the center of town on Main St. with all of its old houses and made my way onto North St. past the new post-office and police station. I saw the old Dale St. School to my left and knew that I was almost there. I turned into the school’s parking lot which was surprisingly pleasant and easy to navigate. I got out of my car and went right to the sidewalk which brought me right to the schools cozy main entrance. It didn’t look like the school entrances from when I was younger. There was no rough brick and it certainly wasn’t a dark inlet. The entrance was welcoming and cozy. I swiped my ID at the door to get in the main lobby doors. I signed into school at the main desk and checked my mail in the office. I said hi to the girls in administration and made my way to my classroom.

The way to my class was a wide passage filled with light. It was a nice day so the windows and folding glass doors were open for fresh air. I passed through the central drop-off area for the students which is often used for performances and interior activities. When I walked into my classroom area I passed the students cubbies and past the bathroom. The room was filled with sunlight and I opened up the windows and sliding doors to the exterior for a breeze to cool the room down.

## CLIENT AND USERS [CON'T]

The buses arrived and we collected our students in our designated areas of the central meeting space. We walked in a group back to the class and the students put their backpacks and sweaters in their cubbies. We then did our morning activities.

We did some painting and of course the kids had paint all over them! Luckily, there were two sinks at their height so they could wash their hands. Since the bathrooms are in-between the classrooms, the students went to the bathrooms as they needed so I could focus on the class. When I needed extra help I called the class assistant who went between my class and the neighboring class. When it was lunch time we gathered by the cubbies so students could get their lunches. We then walked to the central space for lunch.

After lunch it was library time for the class. We walked to the library and were greeted into a cozy space with reading nooks for the kids and an amphitheatre space for group reading. I read them a book there then the students walked around the library, picked out books, and read around the library. This was also the time when the learning specialist would come for students to evaluate in the resource center; it is right next door so none of the other students notice that the student is gone. I also went next door to the teachers resource center which is a nice corner office for everyone.

When library time was over we went back to the class for our afternoon nap-time. The students picked out cozy spots around the classroom. After nap they had free time to play and go outside to the playground. When they came in and washed up we met in the classroom for snack time. Then we had our afternoon learning activities. When the students were finished with their work they could go and play outside. If they had questions I was inside at my desk.

When it was 2:00 I brought the students back to the central space to wait for their buses. When all the kids were gone the teachers and I went to the administration area for our afternoon meeting in the conference room. It was attached to the office and had folding glass doors so we could get fresh air and sunlight. It was a large room with high ceilings and it never felt stuffy. When we were finished I headed back to my classroom to clean-up. Then I went to my desk, grabbed my things, and headed for the main desk to sign out for the day.

## CLIENT AND USERS [CON'T]

### User Narrative– Student:


My mommy woke me up and I got changed and had breakfast. I was getting ready for school and I was excited. When I was finished getting ready for school I went outside to wait for the bus with my backpack and jacket on. The bus came and I got on it. We drove through my neighborhood and across the center of the town. We turned onto the street my school was off of and headed up the big hill till we were in front of the big kids' school. We turned into the school and were dropped off in front of the main entrance. We went inside and into the cafeteria space nearby where we met with our teachers and classes.

When the bell rang we lined up to go to class. We got to our classroom area and put our things in our cubbies. We were sitting until our teacher came over and then we did our morning activities and the pledge of allegiance. When we were finished we went into the paint closet which was low enough so we could get everything we needed. I painted a house and when I was finished I had paint all over my hands so I washed them at the kids' sink. Everything was at my height... even the toilet in the bathroom.

Our teacher called us and said it was time for lunch so we went to our cubbies and got our lunches. I forgot mine so I would get lunch at school. We walked back outside the classroom and went to the cafeteria which was our meeting space. I got in line for food and then sat down with my class to eat. When we were finished it was reading time in the library. We went to the library which was filled with books. We sat in the library with our teacher and she read a book to us. When she was finished we got free time in the library. I wandered around the labyrinth of bookshelves looking for a book to read. When I found one I liked I went to my favorite space in the library. Tucked by a large window was a bench in the wall with pillows. I curled up with my book and looked at the pictures.



## CLIENT AND USERS [CON'T]



Library time was finished so we got in line at the front desk to check out our books. The librarian was at the desk but we were at the same height when I got to the counter. When we all checked out our books we walked back to class. We walked through a glass door outside our classroom and played tag. We went into the sandbox so we had to wash our hands when we went back into the class area. We played blocks and then went to our desks to draw. Our teacher told us it was class time so I put my drawing in my backpack and went back to my desk. The bell rang so we went to our cubbies and then walked back to the meeting space to wait for our buses.

## CHAPTER 5: PROGRAM

In order to understand what the quantity of spaces needed for the building are, an understanding of the amount of students, faculty, administration, and all other employees, along with the times of day they use the building, are imperative to creating a successful program. The qualities of these spaces and there connection with one another are also important; to be able to quantify these, a good prediction of how the spaces are used by the users need to be understood as well.

### THE USERS

#### Students:

Preschool	100 Students	Morning
	100 Students	Afternoon
Kindergarten	200 Students	All Day
First Grade	<u>200 Students</u>	<u>All Day</u>
<b>Total Students:</b>	<b>500</b>	(In school at any time)

#### Employees:

Administration	1 Principal	All Day
	2 Administrators	All Day
	1 Receptionist	All Day
Faculty	12 Preschool Teachers	All Day
	15 Kindergarten Teachers	All Day
	15 First Grade Teachers	All Day
	1 Gym Teacher	All Day
	1 Music Teacher	All Day
Other Employees	1 Learning Specialist	All Day
	1 School Psychologist	All Day
	1 Librarian	All Day
	1 Nurse	All Day
	2 Janitors	All Day
	<u>2 Lunch Ladies</u>	<u>All Day</u>
<b>Total Employees:</b>	<b>56</b>	(In school at any time)

## PROGRAM [CON'T]

.An approximate program for the current Memorial School is as follows:

There are currently 20 Preschool students, 200 Part-time Kindergarten Students, and 200 Full-Time First Grade Students. There are approximately 40 employees.

### LEARNING SPACES

PRESCHOOL	Two Classrooms w/ Two Private Bathrooms	1,600 SF
KINDERGARTEN	Six Classrooms w/ Six Private Bathrooms	4,800 SF
FIRST GRADE	Six Classrooms w/ Six Private Bathrooms	<u>4,800 SF</u>
	<b>Total:</b>	<b>4,800 SF</b>

### OFFICES AND ADMINISTRATION

OFFICE	Main Office	650 SF
	Learning Specialist's Office	150 SF
	School Physiologist's Office	150 SF
	Nurse Station	<u>300 SF</u>
	<b>Total:</b>	<b>1,250 SF</b>

### SPECIAL AREAS

BATHROOMS	Women's Bathroom	200 SF
	Men's Bathroom	200 SF
CAFETERIA	Open Floor Space	1,000 SF
	Kitchen/Storage	500 SF
SUPPORT SPACES	Janitor's Closet w/sink	200 SF
	Mechanical Room	400 SF
LIBRARY	Librarian's Office, Stacks, Desk	1,000 SF
MUSIC ROOM	Classroom and Storage	800 SF
GYMNASIUM	Gym and Storage	<u>1,000 SF</u>
	<b>Total:</b>	<b>5,300 SF</b>

**Total Gross SF: 11,500 NSF + Circulation/Wall Space = 24,500 GSF**

**This is not enough space for the current amount of users and it is poorly laid out on a grid of corridors. Double loaded corridors also do not allow natural light to penetrate the corridors and they always end with double fire-doors.**

## PROGRAM [CON'T]

Based on the number of students and faculty, the following program has been developed for the proposed School:

### LEARNING SPACES

The classrooms will be paired in order for bathrooms to share plumbing while still being adjacent to classrooms. Teachers and assistants for the two classes will also be in close proximity to each other and will be able help with one another's classes. They must have exits to the exterior site and to the interior of the building. The classrooms should have a teacher's desk, a learning area, plenty of storage, and a play-space with two sinks. All furnishings should be at a scale for younger children as well as should be easy to clean and without sharp corners. Maximum amounts of controlled natural light and ventilation shall be provided. The classrooms should have one side facing the exterior with glazing. This side should face South-East, South, or South-West for light. The social spaces should be closer to this side of the spaces while bathrooms and classrooms should be closer to the interior of the building. The classrooms should have an open feeling to them so students do not feel enclosed; along with a southern-facing curtain wall there should be raised ceilings in the social space with lower ceilings in the bathrooms and learning areas. There should not be a strong visual connection to the circulation since it would be a distraction, classrooms should feel like a separate entity within the school. The entrance to the class area should have a strong sense of threshold, possibly set back from the circulation and the location of the students cubbies.

**[Classrooms will be 1600 SF each while bathrooms will be 400 SF each.]**

PRESCHOOL	(3) Pairs of Classrooms w/ Shared Bathroom	<b>12,000 SF</b>
KINDERGARTEN	(5) Pairs of Classrooms w/ Shared Bathroom	<b>20,000 SF</b>
FIRST GRADE	<u>(5) Pairs of Classrooms w/ Shared Bathroom</u>	<b>20,000 SF</b>

Total= 26 Classrooms  
13 Bathrooms

**TOTAL FOR LEARNING SPACES: 52,000 SF**

## PROGRAM [CON'T]

### SUPPORT SPACES

ADMINISTRATION	Principles Office	200 SF
	General Office Area, Waiting Area, Storage	800 SF
	Conference Room	<u>600 SF</u>
	<b>Total:</b>	<b>1,600 SF</b>

Visual connectivity is important as well as a welcoming feeling with comfortable furniture and a cozy waiting area. It will be used at a variety of times so artificial light is needed. The conference room should have direct access to the exterior as well as have an open feeling to it with raised ceilings. It should have a sink and kitchenette for meetings. All offices and administrative areas should have plenty of indirect light, fresh air, and storage. They should be easily accessible to students and employees. Administration should be at the main entrance to monitor all visitors and drop-offs/pick-ups.

NURSES AREA	Office, Private Bathroom, Infirmary	<u>600 SF</u>
	<b>Total:</b>	<b>2000 SF</b>

The nurse's area should also be by the main entrance in case of emergency. It should have a mix of controlled indirect natural light and artificial light. All surfaces should be easily cleaned. The Infirmary needs a sink, lockable storage, and a cold storage area. The nurses office should be adjacent to the entrance of the area with good visual connectivity to the rest of the space. There should be a small waiting area by the nurse's office separated visually from the infirmary. It is important that the infirmary is quiet so it should be far from social spaces.

## PROGRAM [CON'T]

SPECIALTIES	Office for Learning Specialist	200 SF
	Office for School Psychologist	200 SF
	Waiting Area	100 SF
	Resource Center	<u>500 SF</u>
	<b>Total:</b>	<b>1000 SF</b>

The specialties offices and resource center should be separate of the administrative area as to make students using the center more at ease. They should be central to the classrooms for the faculty to use the resource center and to have the learning specialist and school psychologist close to the classrooms for accessibility. They should be adjacent to the library and central to the classrooms. They should have natural and artificial light. The offices should be cozy, with low ceilings and comfortable furniture.

BATHROOMS	Women's Bathroom	200 SF
	Men's Bathroom	<u>200 SF</u>
	<b>Total:</b>	<b>400 SF</b>

Bathrooms should have ventilation and no visual connection with the exterior at least five feet from the ground. They should have two sinks each and one handicapped stall per bathroom along with a non-handicapped accessible stall. One toilet shall be for students at a lower height. They should be located by the main entrance.

MAINTENANCE	Janitor's Closet w/sink	200 SF
	Mechanical Room	<u>600 SF</u>
	<b>Total:</b>	<b>800 SF</b>

Due to noise from the mechanical room, the maintenance areas should be far away from classrooms. They should be adjacent to the kitchen area and central to the building to decrease the amount of piping/ductwork.

**TOTAL FOR SUPPORT SPACES: 5800 SF**

## PROGRAM [CON'T]

### SPECIAL AREAS

CAFETERIA/MEETING SPACE	Open Floor Space	2,000 SF
	Kitchen	600 SF
	Cold Storage/Storage	200 SF
	Chair/Table Storage	<u>200 SF</u>
	<b>Total:</b>	<b>3000 SF</b>

The cafeteria should be a large space with a high ceiling for special events.. There should be a mix of controlled natural light and artificial light. There should also be a strong visual connection with the exterior, and ventilation. All surfaces should be easily cleaned and no fixed furniture should be used. There should be a kitchen and cold storage area adjacent to the space with additional storage for seating/tables.

LIBRARY	Librarian's Office, Stacks, Desk	<u>2,000 SF</u>
	<b>Total:</b>	<b>2,000 SF</b>

The library should be filled with controlled natural sunlight as well as have several different areas and private spaces for reading. High ceilings should be used for the space. An area should be open for class activities. The desk should be near the entrance and low enough for students to sign out and return books. The librarian's office should be adjacent to the desk and entrance.

**TOTAL FOR SPECIAL AREAS: 5000 SF**

## PROGRAM [CON'T]

The total net area of the building is as follows:

Learning Spaces	52,000 SF
Support Spaces	5800 SF
Special Areas	<u>5000 SF</u>
<b>Total Net SF:</b>	<b>62,800 SF</b>

The Gross Square Footage includes non-usable space (example: Walls) and estimated circulation. It is the net square footage multiplied by a factor of 1.3 which accounts for circulation and wall space.

**Total Gross SF: 81,640 SF**

### **EXTERIOR AREAS**

The entire site, including the area around the Dale Street Elementary School, will be re-planned for better access, playgrounds, sports fields, and parking. There will be a bus drop-off area for both schools, a covered drop-off area for parents, as well as a loading dock for deliveries. For the playgrounds, there will be three playground areas; one for pre-school students, one for kindergarten and first grade students, and another playground for the Dale Street Elementary School. Separate playgrounds are needed due to the physical abilities of each age group associated with the grade levels.

Parking is a major problem on the site. In accordance with Building/Zoning Codes and the program, the following number of parking spaces will be provided:

Minimum: 56 Employee Parking Spaces or one spot for each 4 auditorium seats (larger number).

Minimum: 2% of parking must be handicapped accessible with 1/6 van accessible.

**Please see Regulatory Environment for more on parking.**

**Please see Appendix B for actual square footages.**



## PROGRAM [CON'T]

### PROGRAM ADJACENCY DIAGRAMS

On the following pages are three separate programmatic options: the linear program, the central program, and the L-shaped program. For each there are various relationships and adjacencies of different programmatic elements which are investigated. They all fit within the maximum floor area based upon 20% of the site as covered in the Regulatory Environment Section.

Further study is offered in the program's relationship and adjacencies with the site. The two options for each program type experiment with entrances to the site, to the building, and how sun and site characteristics effect the placement of the program. Noise, sun, function, and relationship to entrance and site are all taken into consideration. Each variation of the program has advantages and disadvantages that will be discussed.

In many cases, classrooms are in groups whereas the special spaces and support spaces are centralized for easy accessibility. All classrooms have access to the exterior while most of the non-classroom spaces do as well. All the program options are one-story due to the neighborhood. The area is mainly one-story residences so to relate to the site the exterior should be only one story high. The site is also large enough for the program on one story which also allows all elements to be adjacent to the exterior.

Possible parking areas, playground areas, bus routes, and other master-planning considerations will be discussed with the program adjacency diagrams, further study is in the Site Information section.

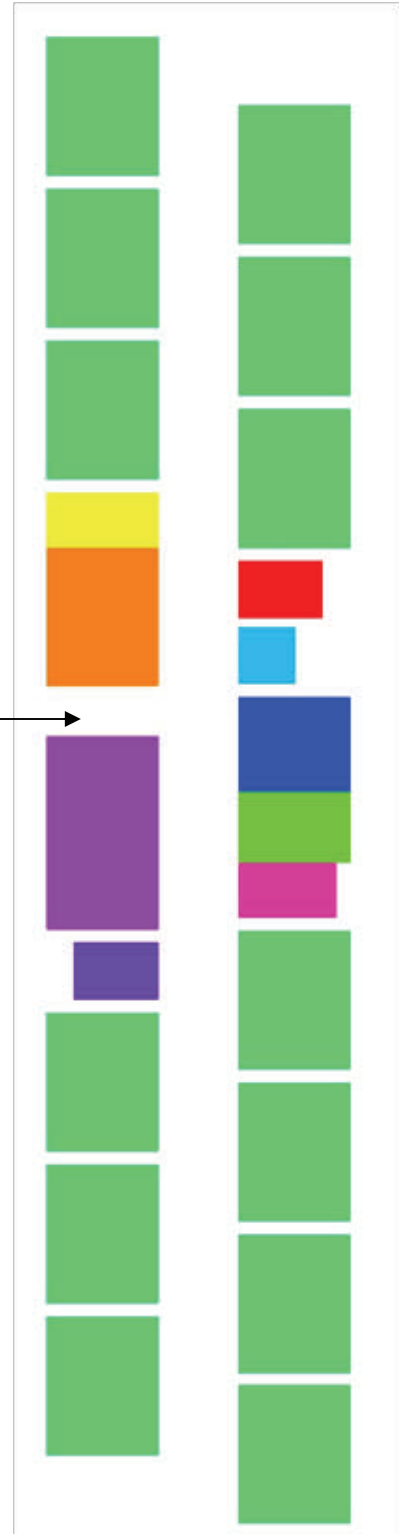
## PROGRAM [CON'T]

### LINEAR RELATIONSHIP DIAGRAM

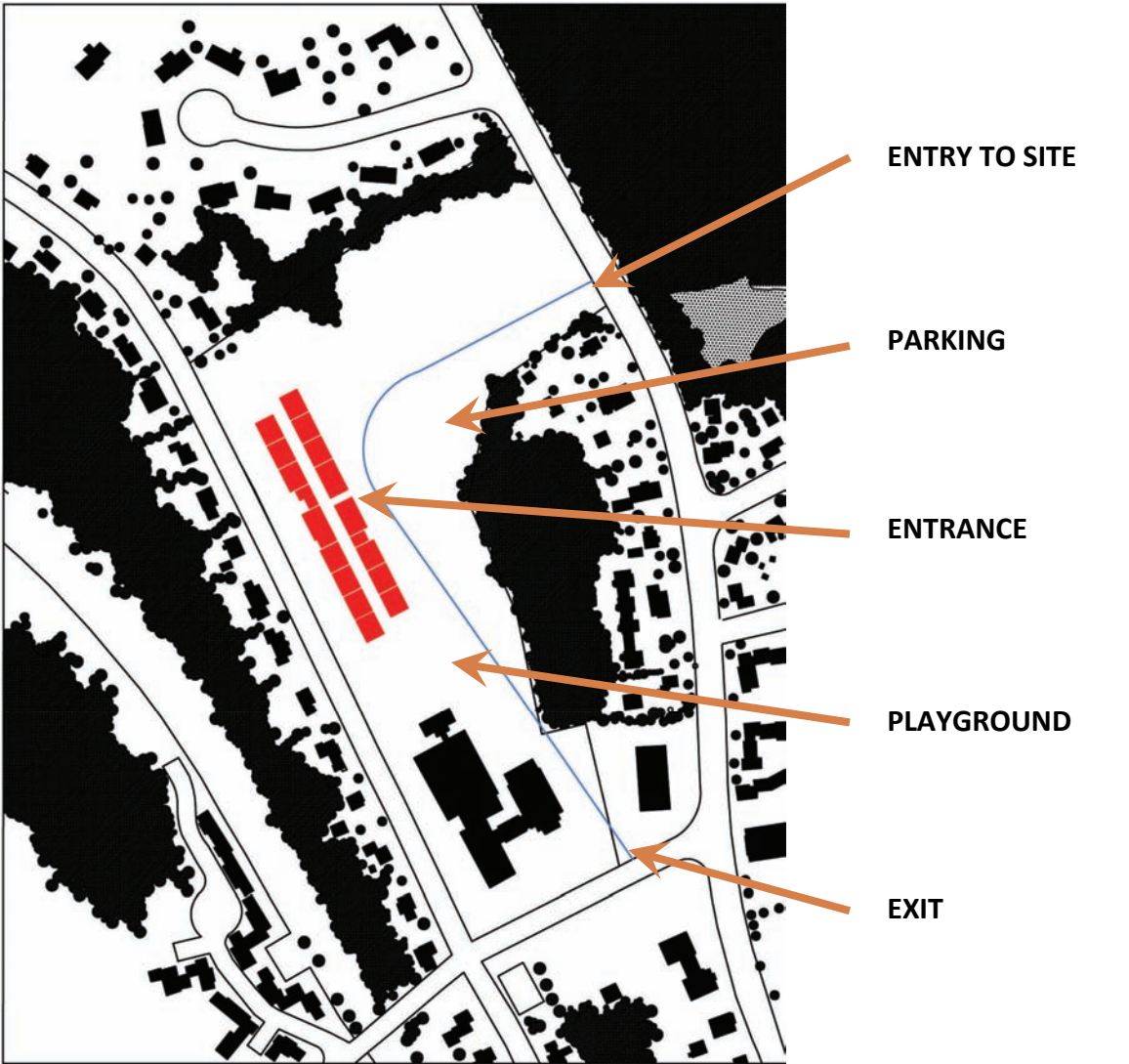
This linear shaped program allows for a strong visual connection from an inner streetscape. The entrance and all support spaces are all centralized while on either side of them are classrooms. All spaces have direct exterior access the fresh air, sunlight, and the site. Due to the linear plan however, to go from one end of the building to the other is a long distance. The other drawback of this diagram is the need for focal points and distinctions along the inner streetscape.

- NURSES AREA
- GYMNASIUM
- SUPPORT AREA
- LIBRARY
- CLASSROOMS
- PUBLIC BATHROOMS
- ADMINISTRATION
- MUSIC ROOM
- CAFETERIA / AUDITORIUM
- RESOURCE CENTER

ENTRY →



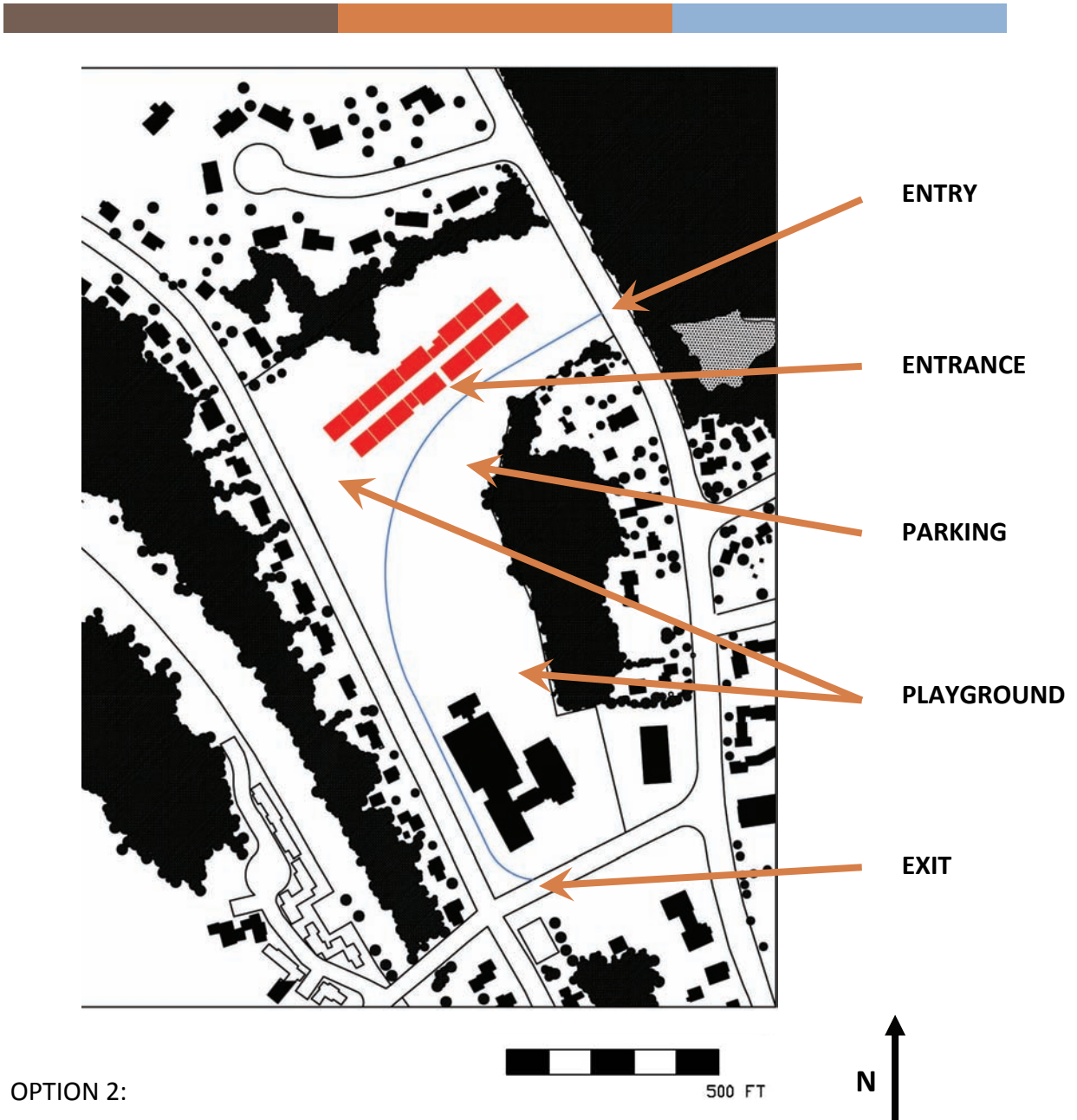
# PROGRAM [CON'T]



OPTION 1:

This option for the linear plan responds to the strong delineation of residences to the West of the site. This plan also allows the proposed program to relate to the existing Dale Street School for continuity between the two schools. Playground space could be located between the two buildings with a separate playground on the northern edge of the site for the younger preschool students. The parking and bus route would be sheltered by the vegetation to the east and the schools on the western half of the site. Parking would be along this route in between the two schools.

## PROGRAM [CON'T]



OPTION 2:

This option of the linear plan opens up the site in between the two schools. The two schools are in juxtaposition to one another. The elevation's area facing the residences to the west is minimal. In this option the schools however there is no continuity between the two schools and the site is divided. Also, while the position is great for natural day-lighting of the southern spaces, the northern half of the building would have indirect sunlight.

## PROGRAM [CON'T]

### L-SHAPE RELATIONSHIP DIAGRAM

This L-shaped diagram has two wings to break up the length visually. The classrooms are split in half between the wings. The gymnasium is at one end of the wings and separated from the other special spaces and supported spaces for a strong connection to the site. In this option not all of the spaces have direct access to the site and those are the mechanical space and public bathrooms which are central to the plan. This plan provides focal points unlike the linear plan. Again, the support and special areas are grouped around the entrance.

ENTRY



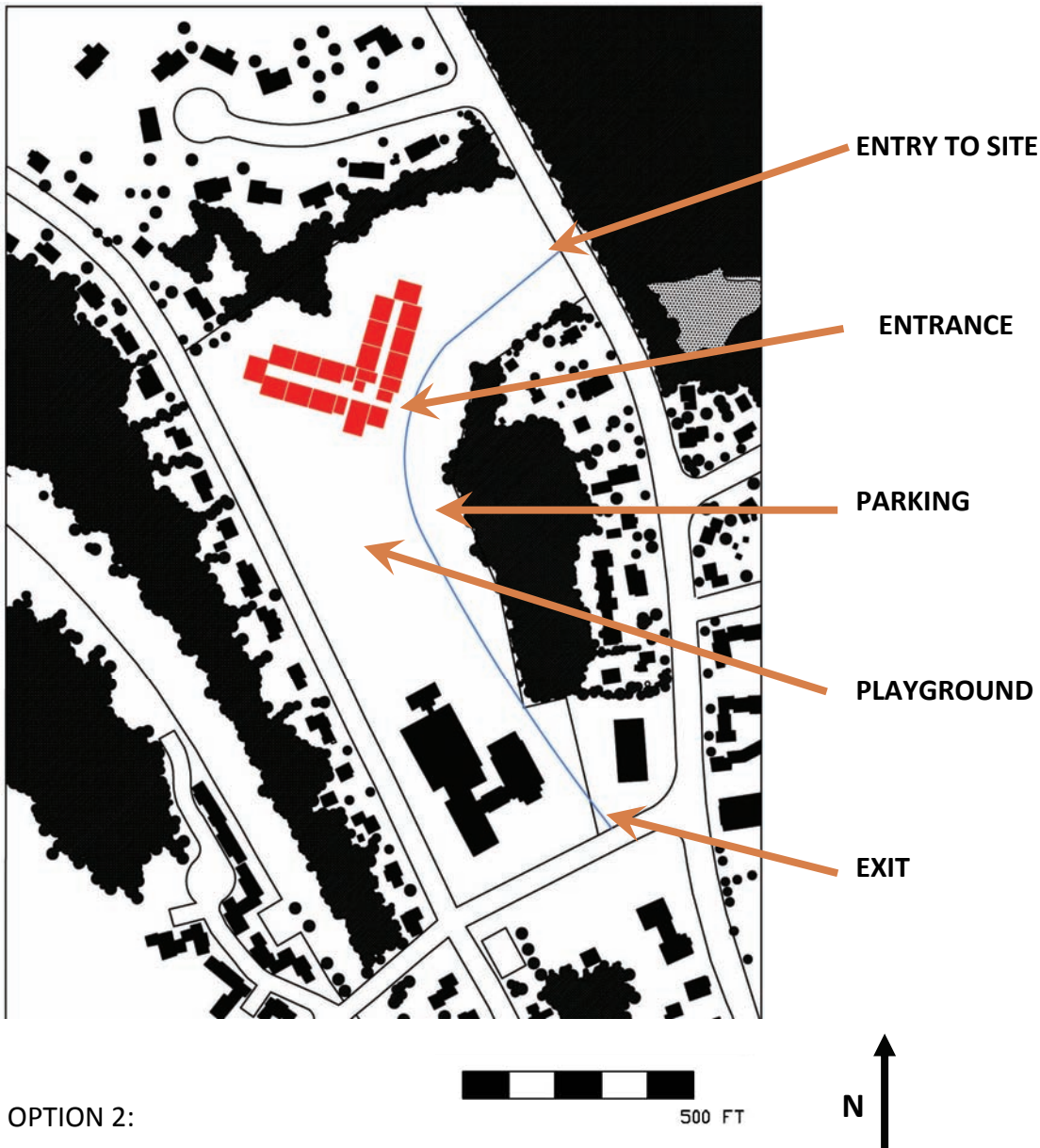
## PROGRAM [CON'T]



OPTION 1:

This L-Shaped option creates an inner campus shared between the two schools. Parking could be along the north and western edges of the site. Playgrounds and playfields would be at the center of the site. Due to the layout of the program, all but six classrooms have access to direct sunlight. The library and offices have northern light which is more constant.

## PROGRAM [CON'T]



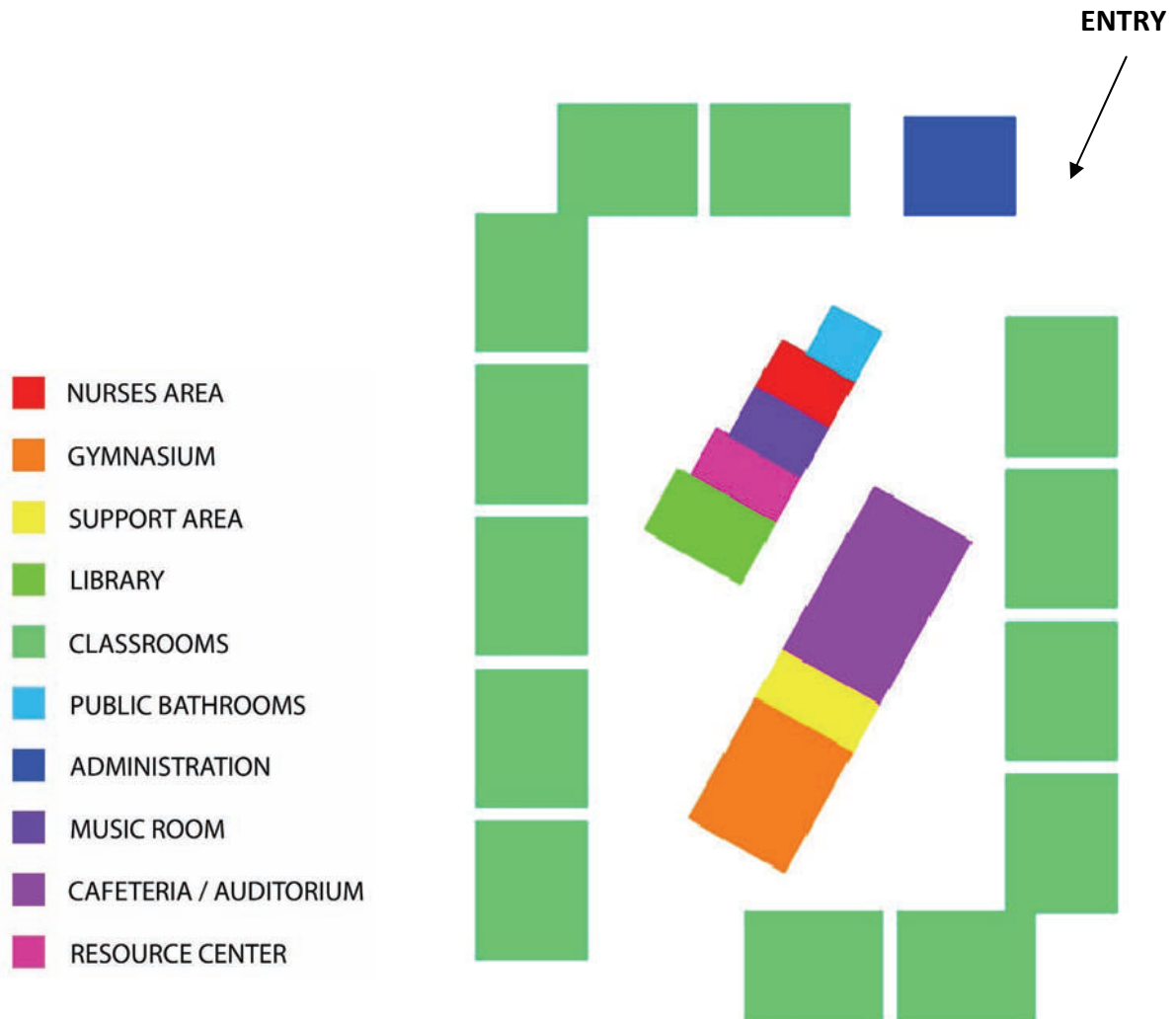
OPTION 2:

In this option of the L-shaped program, the entrance is facing south-east along an inner bus-route. The two schools share an open space for play-field in the center of the site to the west. Parking would be adjacent to the vegetation on the east along the bus route. While the classrooms on the north side do not have direct sunlight they have access to a slightly enclosed play area. The schools are juxtaposed in this scheme in order for the school to be set back on the site.

## PROGRAM [CON'T]

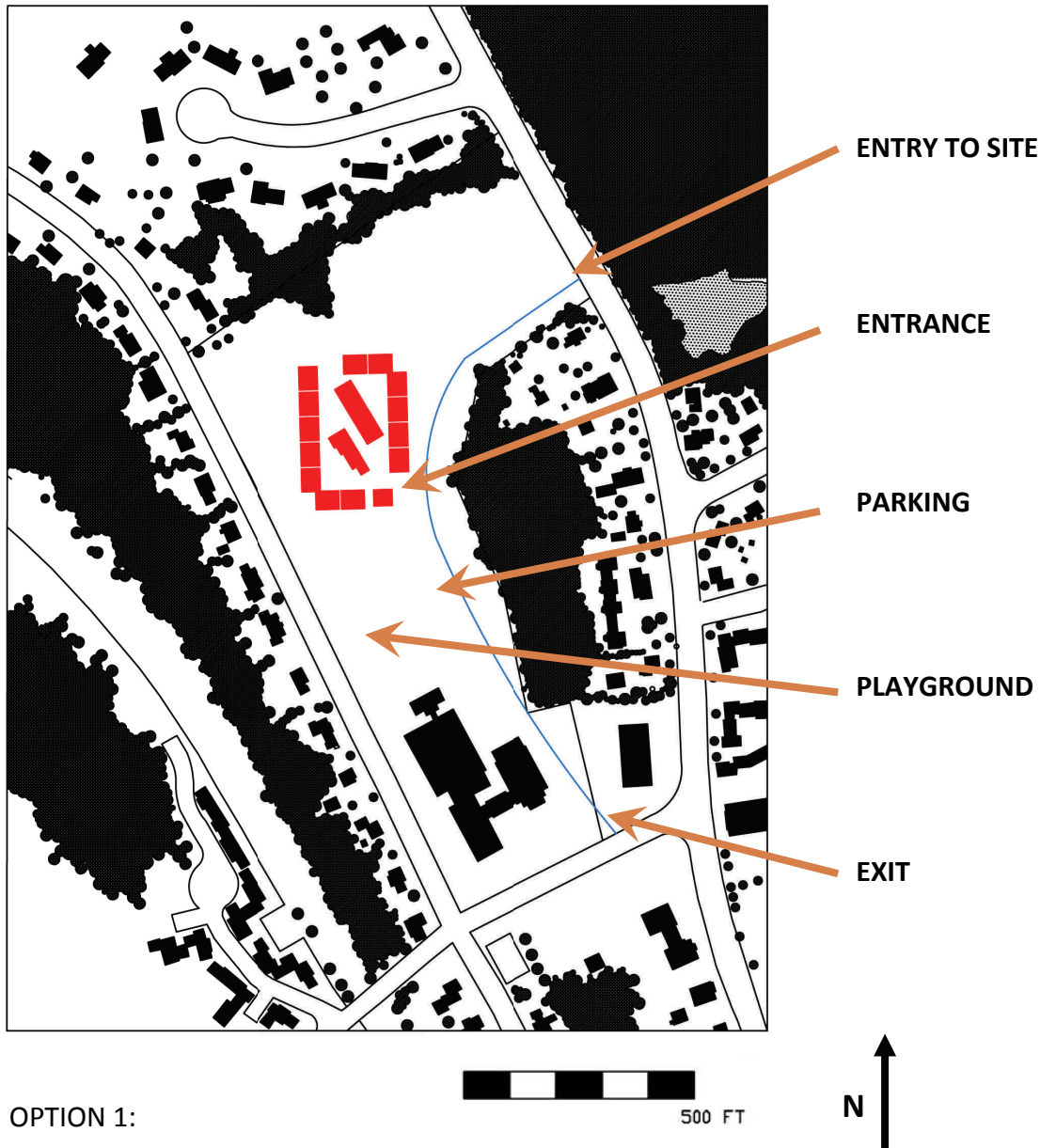
### CENTRAL COURTYARD RELATIONSHIP DIAGRAM

This Centralized program relationship option is different from the linear and L-shaped programs. Circulation does not just go in one or two directions; in this program it is circular and offers various social nodes. At least two sides of each space has access to direct sunlight and all have access to an exterior space for fresh air. The placement provides a noise buffer between classrooms and the central area with all of the special spaces and support spaces. The entry is on a diagonal connecting with these spaces while the classrooms are along the periphery. The diagram is almost reminiscent of a garden-city concept.





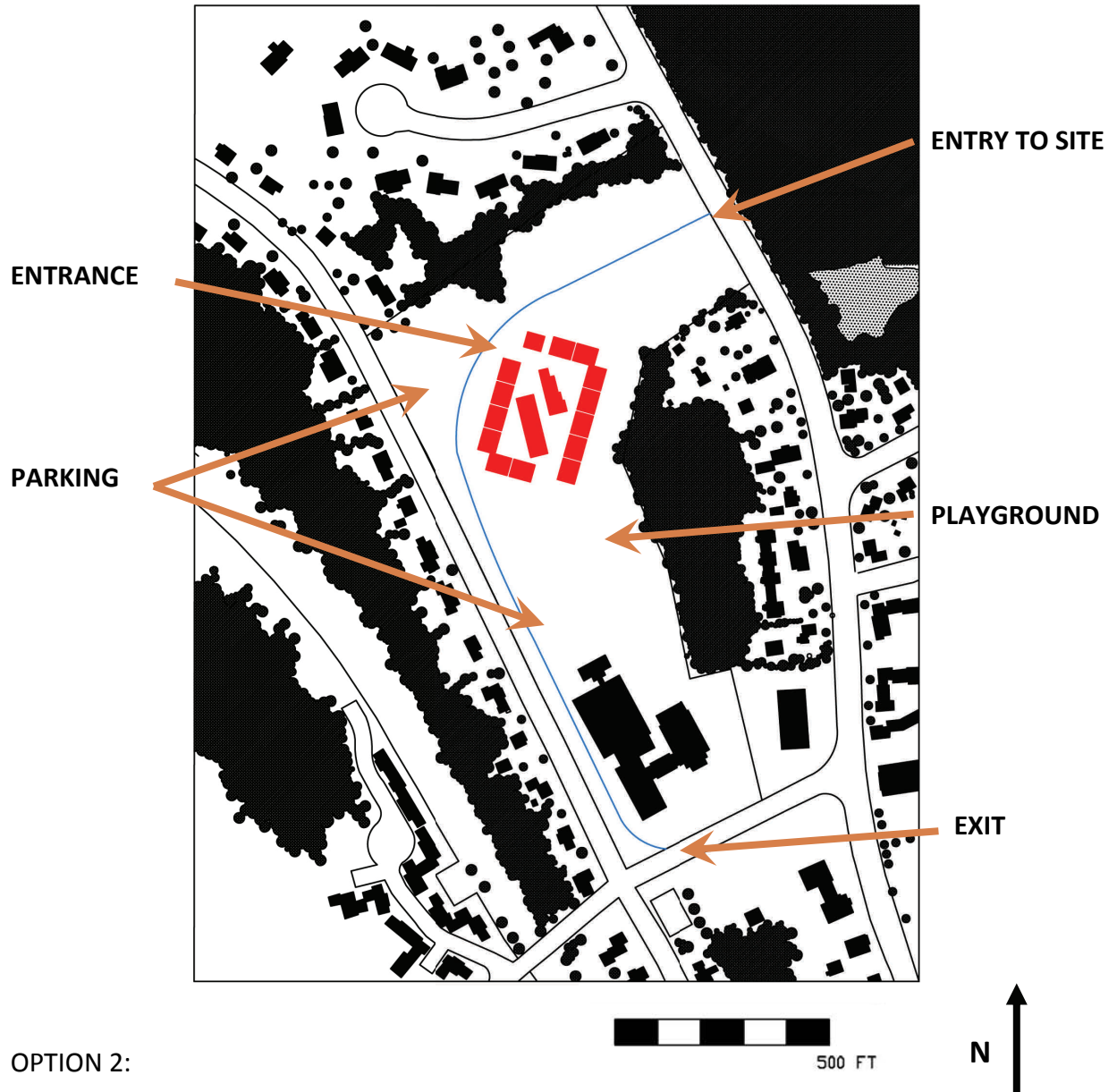
## PROGRAM [CON'T]



OPTION 1:

This program layout on site offers direct sunlight to all spaces in the program. The entry is along the bus route. While there is not a strong connection between the two schools, the massing recedes from the residential area making the building less intrusive in the neighborhood. The parking would be along the eastern edge of the site allowing for green spaces and playground areas on the western and northern edges of the site.

## PROGRAM [CON'T]



OPTION 2:

This option offers a better visual connection between the two schools while the program is still a separate entity. The entrance is nestled in the north-west corner of the site along the bus-route which is not entirely welcoming. However, a formal route from public areas with the procession of office to specialty areas, ending in the inner part of the site, is a good sequence from public to private. This option allows for an inner campus between the two schools.

# PROGRAM [CON'T]



Based upon an analysis of the different options available, the L-shaped option 1 is the best of the schemes for reasons of circulation and sunlight. It provides the opportunity to create a boundary of the exterior environment to the site and allows for a focus on the central space. It is somewhat compact whereas the Linear Schemes are extremely long and would not be desirable for breaking up the spaces into separate entities. The Centralized Scheme unfortunately does not connect well enough to the exterior environment and the design would not take advantage of the sun's position/path.

## CHAPTER 6: SITE INFORMATION

The proposed site is the existing location of the Memorial School which is adjacent to the center of town in a light residential area. The property the school is on also contains the Dale St. Elementary School. The following section will document the proposed site.

**This section contains the following site information:**

- 1.) History of Medfield and the proposed site
- 2.) Demographics
- 3.) Region
- 4.) Town and Neighborhood
- 5.) Climate  
-Sun, Wind, Temperature, Precipitation
- 6.) The Site
- 7.) Site Sections
- 8.) Natural Features of the Site  
-Slope, Vegetation, Soil
- 9.) Manmade Features of the Site  
-Nodes, Transportation, Landmarks, Existing Buildings, Properties
- 10.) Site Dimensions
- 11.) Pictorial Documentation of Site



Plan of Site



## SITE INFORMATION [CON'T]



### HISTORY OF MEDFIELD

The town was formed when its founders had the land declared separate from the Dedham settlement in 1651. Medfield started with only thirteen families when it became the 43rd town in Massachusetts. It wasn't long however until the town was destroyed. In 1675 half the town was burned to the ground in King Phillip's War.

After the war, the town flourished and the towns of Medway and Millis were formed from the western part of Medfield. The town was mainly orchards and farms for cattle raising. The agricultural town grew and in the 19th century a straw hat factory (which still stands on Main St.) moved into the town and was the town's biggest employer. In the late 19th century the Medfield State Hospital was opened and held up to 2,000 patients.

### HISTORY OF THE SITE

In 1921, tragedy struck again with the worst fire since King Phillip's War. Four square miles of the town were destroyed. The fire started near the State Hospital along the town's train tracks from a locomotive fire. It spread across town and engulfed the proposed site where there was a farm owned by George Ellis. The fire spread all the way to Main Street. Eventually the area was rebuilt from Main St. and up past the proposed site. The proposed site is where the town built the Dale St. School after the fire. It was the first official high school in town and also included the building which is now the Phaff Center for Senior Citizens. Soon after the Memorial School was built on the site.

(See: Tilden, and [www.medfieldfire.com](http://www.medfieldfire.com))

## SITE INFORMATION [CON'T]

### DEMOGRAPHICS

According to the US Census Bureau Demographics:

POPULATION	Total Population:	12,273	Male:	49.1%
			Female:	50.9%

AGE	Under 5 y/o:	1,042	8.5% of Population
	5-9 y/o:	1,272	10.4% of Population

(Average # of children / year under age 10 is 220/ age)

RACE	White	11,953	97.4% of Population
	Asian	251	2% of Population
	Black	90	.7% of Population
	Other	47	.4% of Population
	American Indian	13	.1% of Population

HOUSEHOLDS	Family Households	3,268	81.7% of Households
	Single Parent	400	10% of Households

	Owner Occupied	3,431	86.7% of Households
	Renter Occupied	571	14.3% of Households

Average Household Size = 3.02 People

Average Family Size = 3.41 People

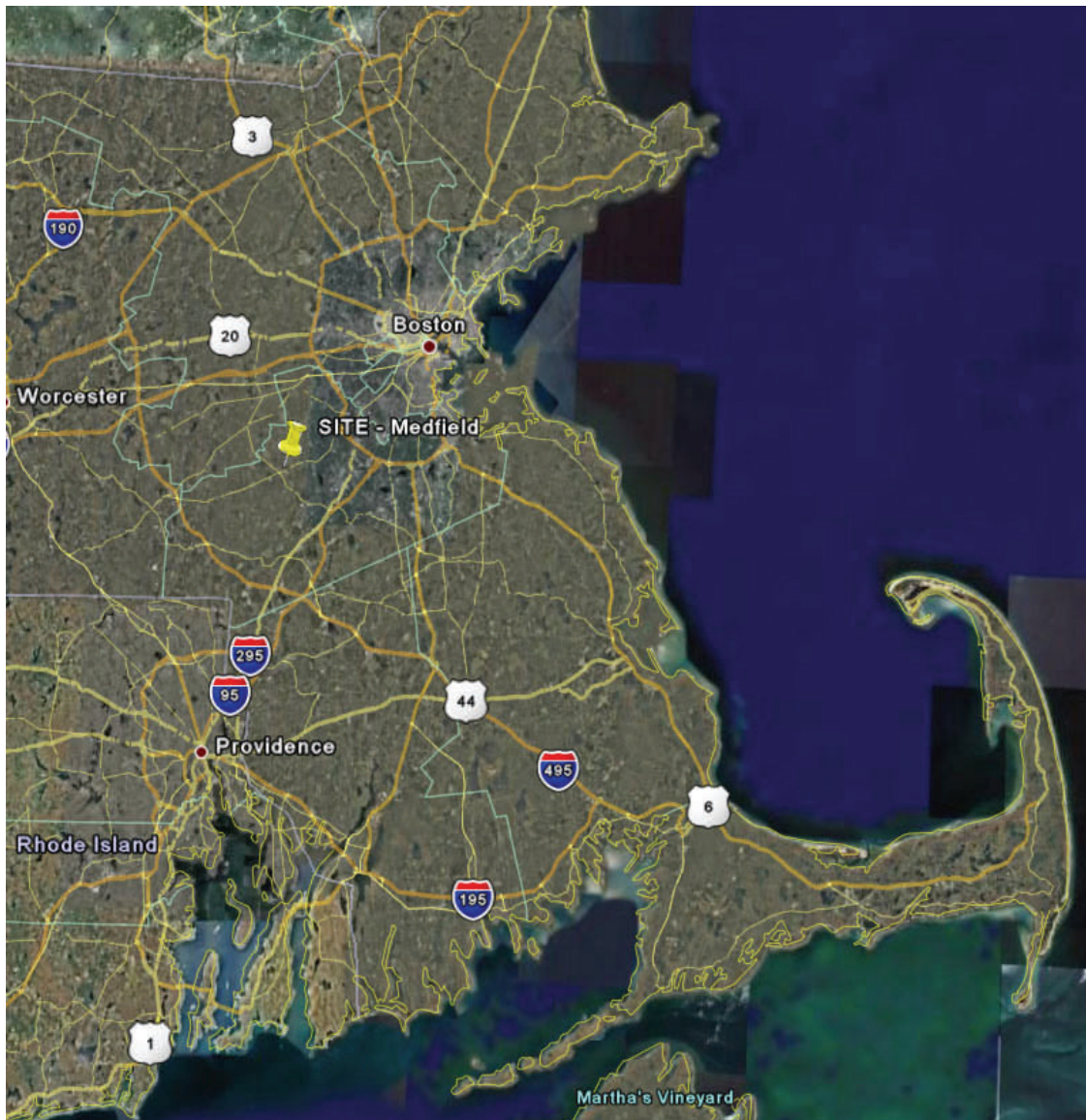
DENSITY	726 People/ Square Mile
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TOTAL AREA	14.6 Square Miles
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## SITE INFORMATION [CON'T]

### REGION

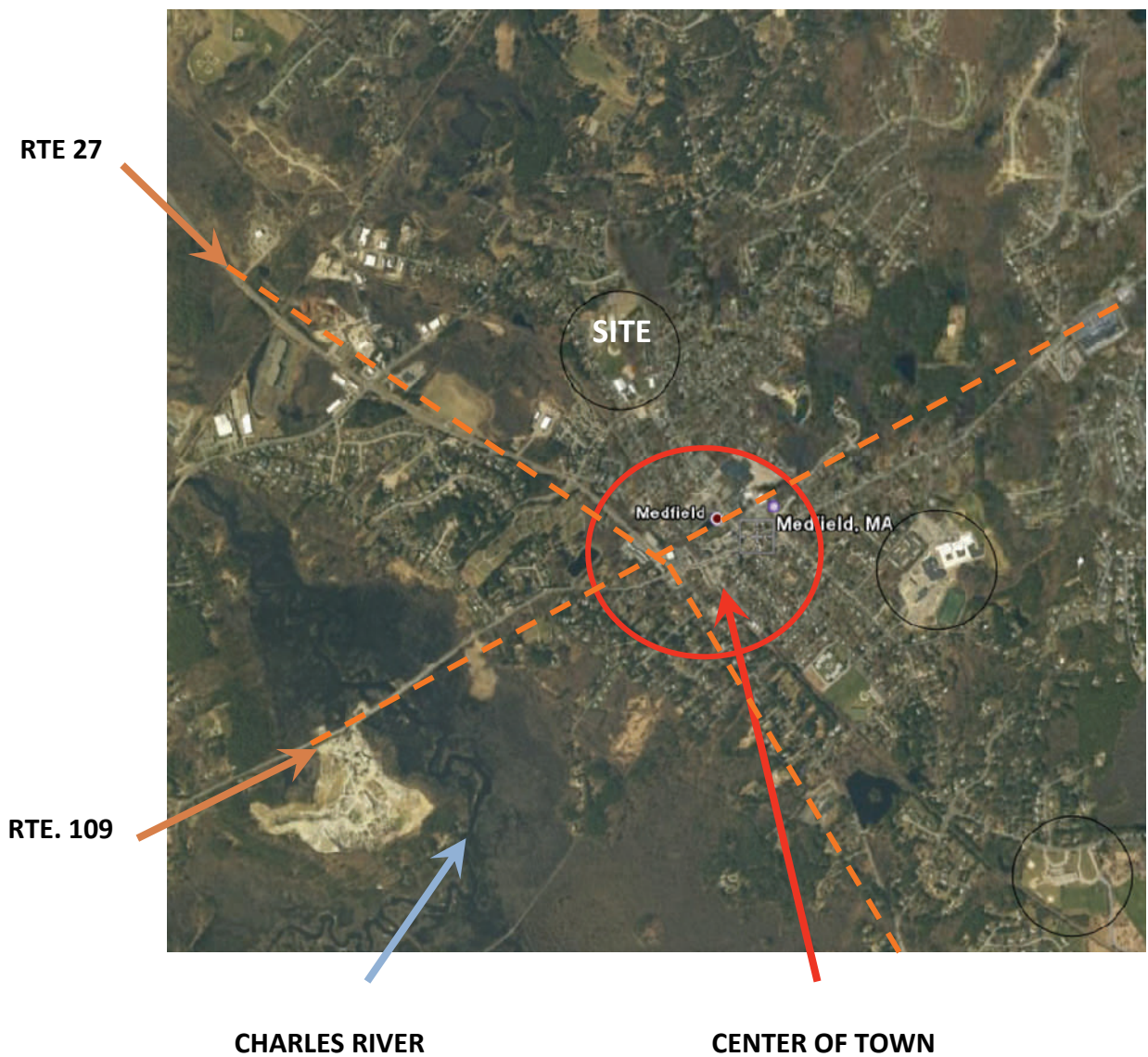
Medfield is located in Metro west Boston along the Charles River. It is 45 minutes from downtown Boston and 45 minutes from downtown Providence. It is twenty minutes from Routes 495, 95, and 93. It is in a popular area to live for commuters.



## SITE INFORMATION [CON'T]

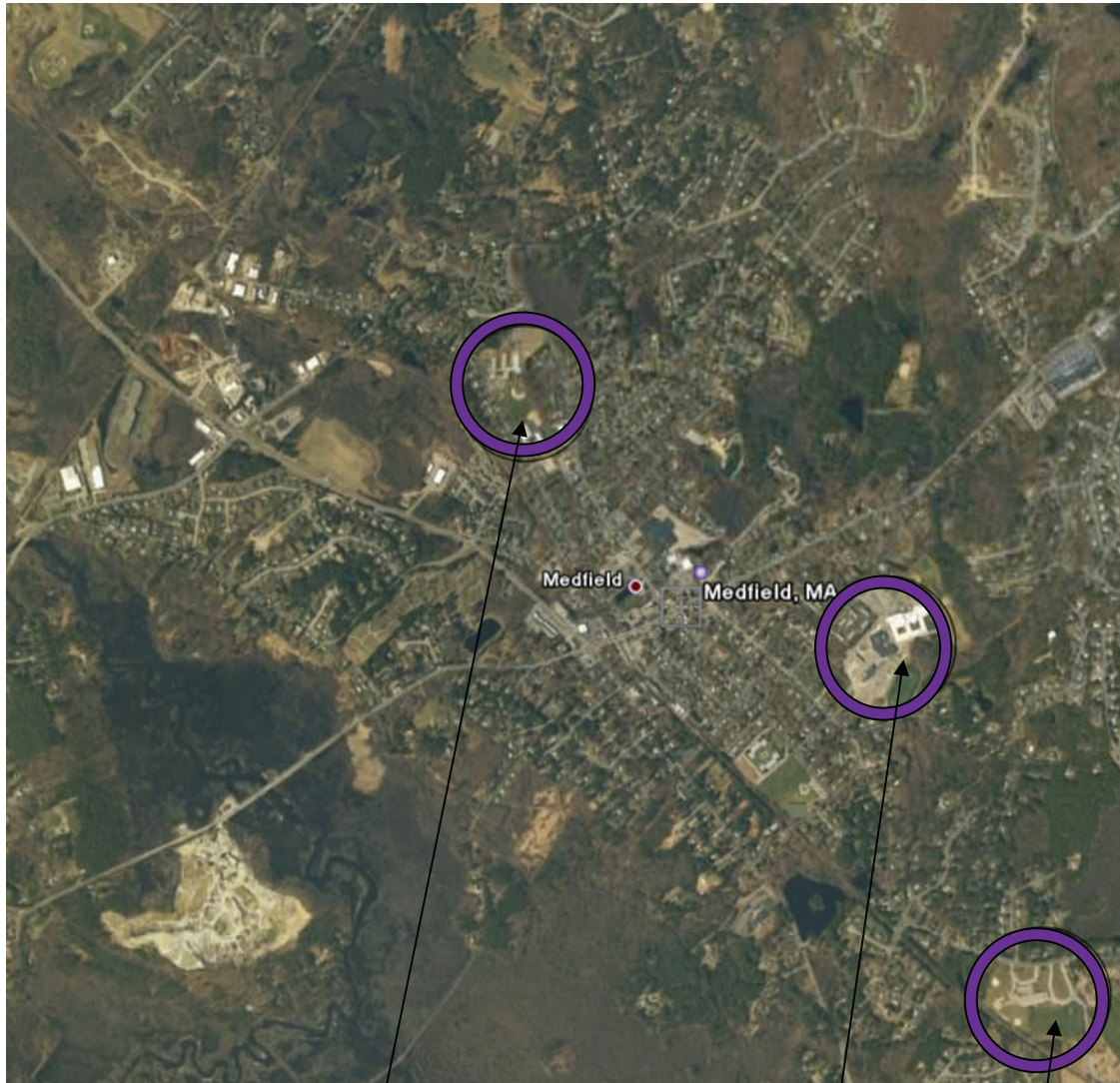
### TOWN

As stated previously, Medfield is along the Charles River in the Neponset River Shed area. The center of town is defined by Main St. ( Route 109 ) and Route 27. Both are the major roads to the highway and to the surrounding towns of Walpole, Norwood, Westwood, Dover, and Millis. Most of the housing is to the North-west and South-West of Route 27.





# SITE INFORMATION [CON'T]



## MEDFIELD SCHOOLS

Memorial School & Dale St. School

Pre-K – 1<sup>st</sup>

2<sup>th</sup> – 3<sup>th</sup> Grade

High School & Middle School

9<sup>th</sup> – 12<sup>th</sup>

6<sup>th</sup> – 8<sup>th</sup> Grade

Wheelock Elementary School

4<sup>th</sup>-5<sup>th</sup> Grade

## SITE INFORMATION [CON'T]

### NEIGHBORHOOD

The neighborhood is composed of light residential to the north and west of the site on Adams Street and Wheelwright Road. Some multi-family residential is located to the east of the site along North Street. There is a wetland area to the far east of the site adjacent to Winter Street and North Street. Several community buildings are south of the site since this neighborhood is within a half mile of the center of town. These buildings include the Dale Street School, Memorial School, Phaff Center for Senior Citizens, and the Medfield Police Station. There is also a basketball court on the corner of Adams Street and Dale Street which is heavily used. Train tracks border the edge of the site to the west.

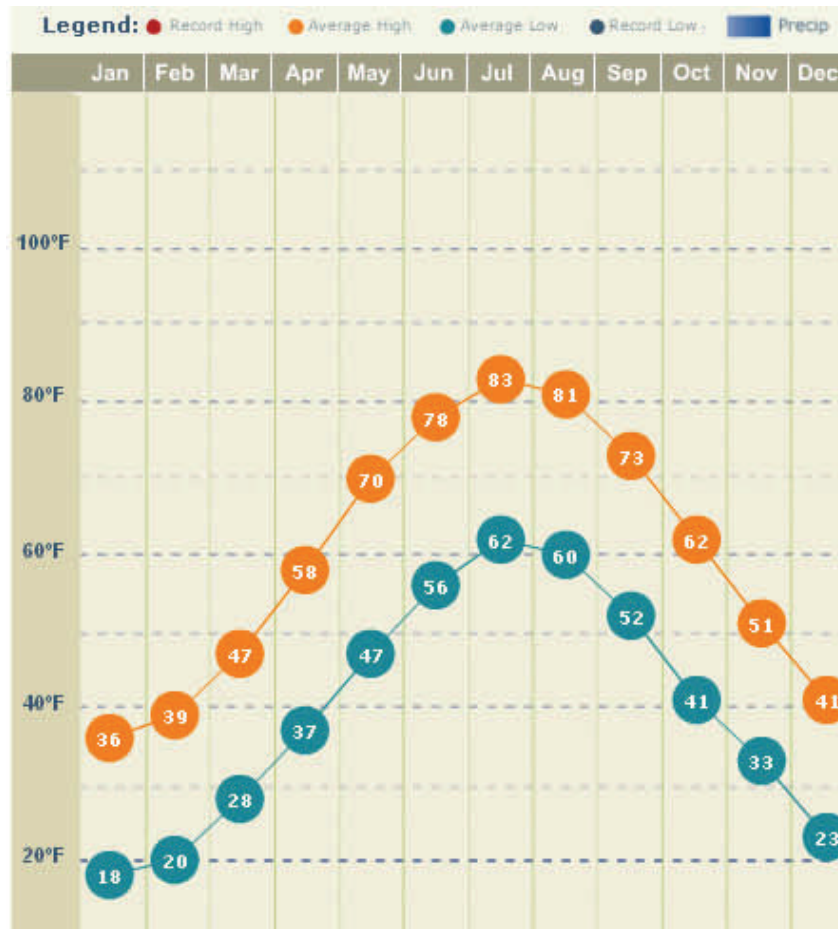
While the residences are mainly one-story wood siding, asphalt roofed structures, all the community buildings and the multi-family residence in the south-east corner of the site are brick structures. There are several two story farm-houses and colonial houses along Main Street and North Street.



## SITE INFORMATION [CON'T]

### CLIMATE

This part of new England is typically hot and humid in the summers , dry and cold in the winters. The average temperatures in the summer are in the late 70 degree F range while in the winter the temperature is in the early 40 degree F range. See below for temperature high and lows for Medfield by month.



Precipitation in snow averages around 4" each month in the winter time as seen below.

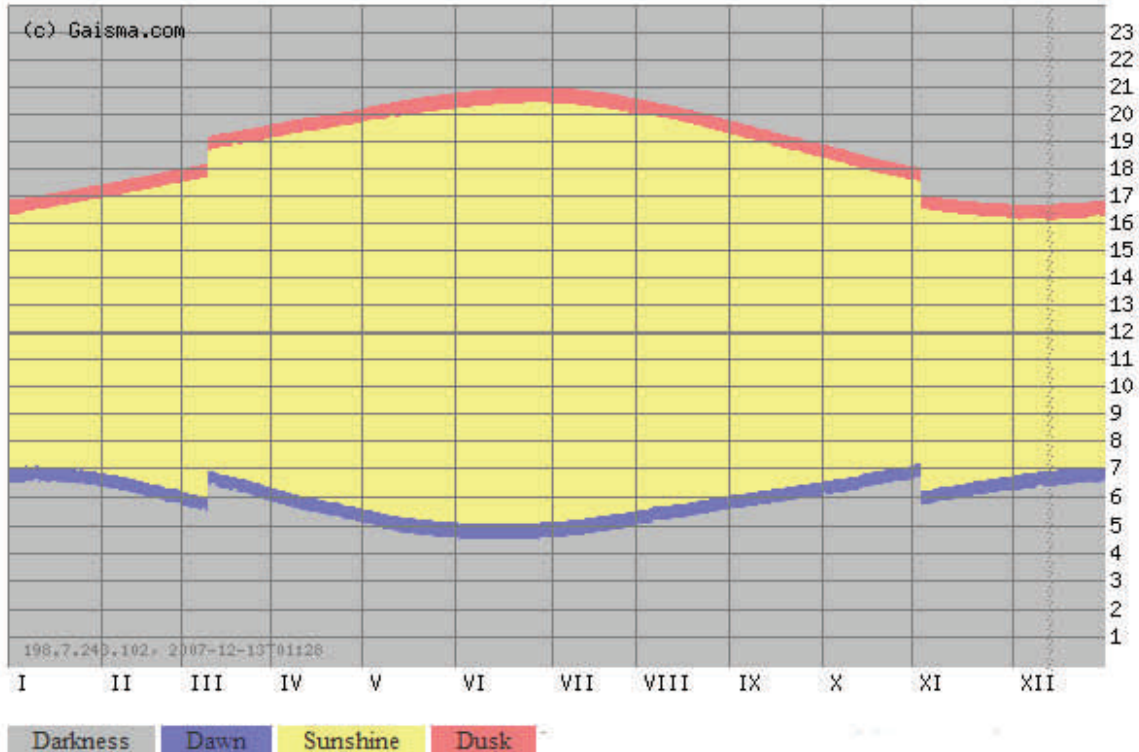


([www.weather.com](http://www.weather.com))

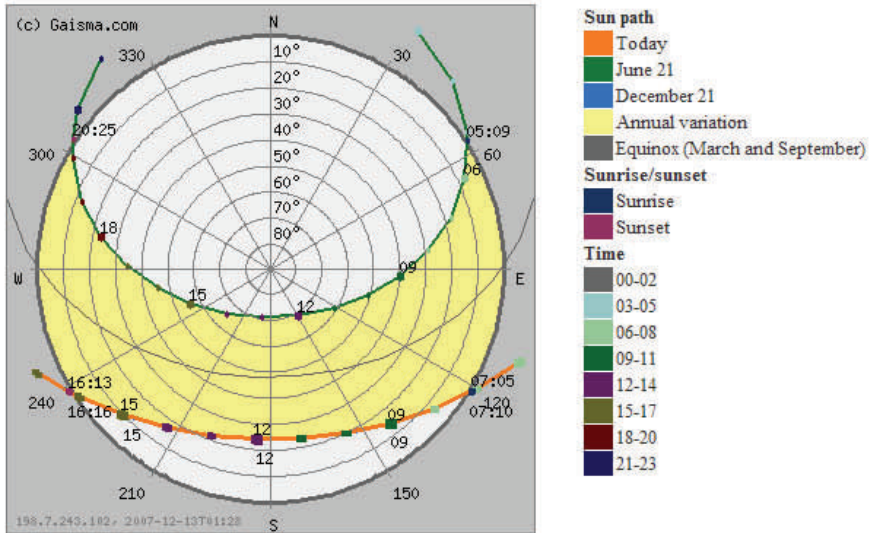
## SITE INFORMATION [CON'T]

### SUN

Date	Sunrise	Sunset	Length	Change	Dawn	Dusk	Length	Change
Today	07:04	16:13	9:09		06:32	16:45	10:13	
+1 day	07:05	16:13	9:08	00:01 shorter	06:33	16:45	10:12	00:01 shorter
+1 week	07:09	16:15	9:06	00:03 shorter	06:37	16:47	10:10	00:03 shorter
+2 weeks	07:12	16:19	9:07	00:02 shorter	06:40	16:50	10:10	00:03 shorter
+1 month	07:13	16:33	9:20	00:11 longer	06:41	17:04	10:23	00:10 longer
+2 months	06:48	17:10	10:22	01:13 longer	06:19	17:39	11:20	01:07 longer
+3 months	07:03	18:47	11:44	02:35 longer	06:35	19:15	12:40	02:27 longer
+6 months	05:08	20:21	15:13	06:04 longer	04:34	20:56	16:22	06:09 longer



# SITE INFORMATION [CON'T]



**Sun Diagram – Morning**



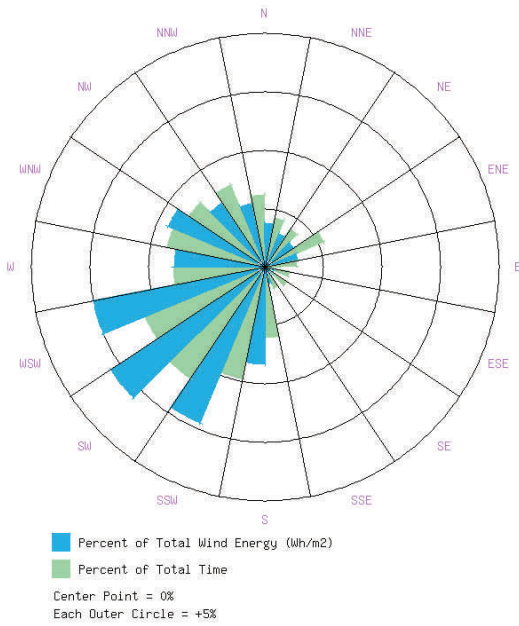
**Sun Diagram – Afternoon**

As seen in these diagrams, the site has ample sunlight in both morning and afternoon. The only part of the site which is consistently shaded is in the north-east part of the site which cannot be built on due to setbacks.

# SITE INFORMATION [CON'T]

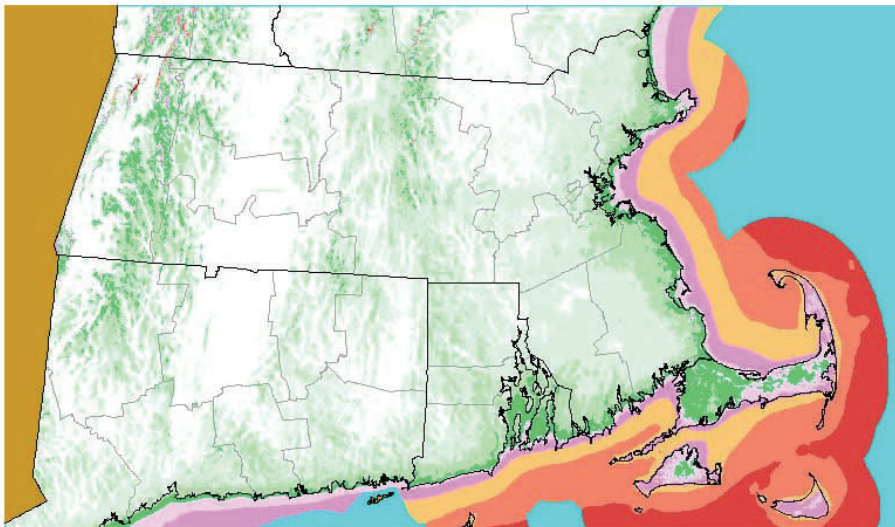


Wind Rose Graph



The wind mainly comes from the S-W however some wind comes from the N-W and West.

The average wind speed in Medfield is 5.3 m/s.



  
**TrueWind Solutions**  
 255 Fuller Road  
 Suite 274  
 Albany, NY 12203-3556  
 www.truewind.com  
 Tel: 518-437-8661  
 Fax: 518-437-8659

Wind Resource	
Mean Speed	
mph	m/s
< 12.3	< 5.5
12.3 - 13.4	5.5 - 6.0
13.4 - 14.5	6.0 - 6.5
14.5 - 15.7	6.5 - 7.0
15.7 - 16.8	7.0 - 7.5
16.8 - 17.9	7.5 - 8.0
17.9 - 19.0	8.0 - 8.5
19.0 - 20.1	8.5 - 9.0
20.1 - 21.3	9.0 - 9.5
> 21.3	> 9.5

([www.truewind.teamcamelot.com](http://www.truewind.teamcamelot.com))

# SITE INFORMATION [CON'T]

## OVERHEAD OF SITE



Site sections





## SITE INFORMATION [CON'T]

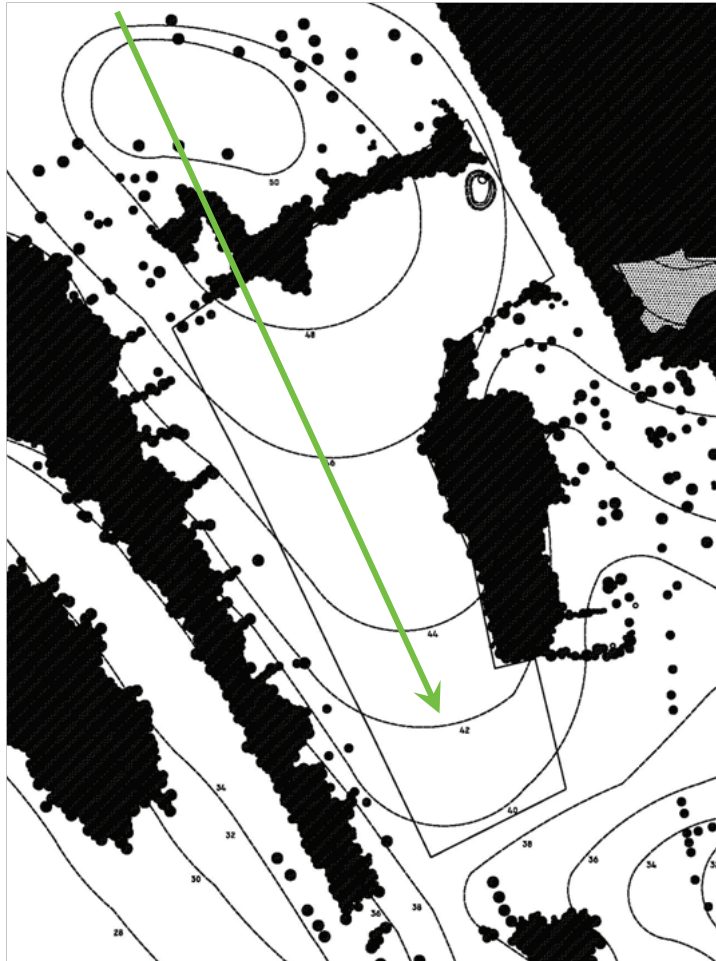
### NATURAL FEATURES OF THE SITE

**SOIL:** Glacial till deposits have created a variety of Sand-Silt soil in Medfield which effects how well the drainage of the site works.

**VEGETATION:** The area has mainly evergreen shrubs, Spruce, Elm, Fir, Hemlock, and Maple trees.

**SLOPE:** The site has a slight slope to the south/south-west with a 6 foot change in height which can be seen in the site section.

Site Elevation at police station is 178 feet above sea level.



Luckily, an easement drain in the north-east corner of the site allows for excess storm water where there is less slope. The thick vegetation around the site helps to alleviate

## SITE INFORMATION [CON'T]

### MANMADE FEATURES OF THE SITE

Built structures include: Streets, Property lines, Buildings, Train Tracks, Basketball Court, and the school to be demolished.

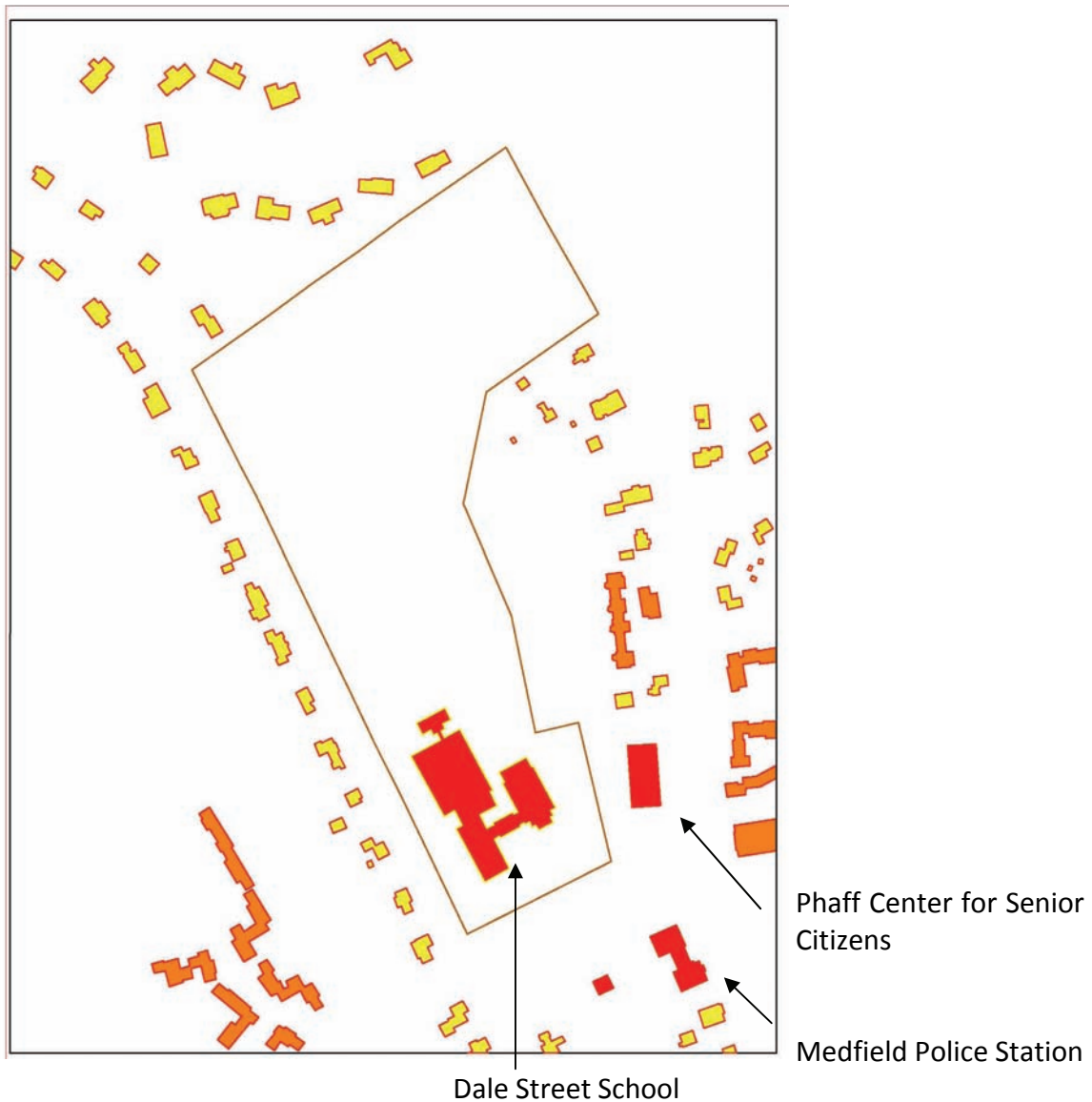


## SITE INFORMATION [CON'T]

### EXISTING BUILDING FABRIC

The buildings existing on the site (except school to be demolished) include low-rise single family housing (yellow), low-rise multi-family housing (orange), and community buildings (red). There is a low-density building fabric as seen in this diagram.

Landmark buildings include:



## SITE INFORMATION [CON'T]

### TRANSPORTATION AND NODES

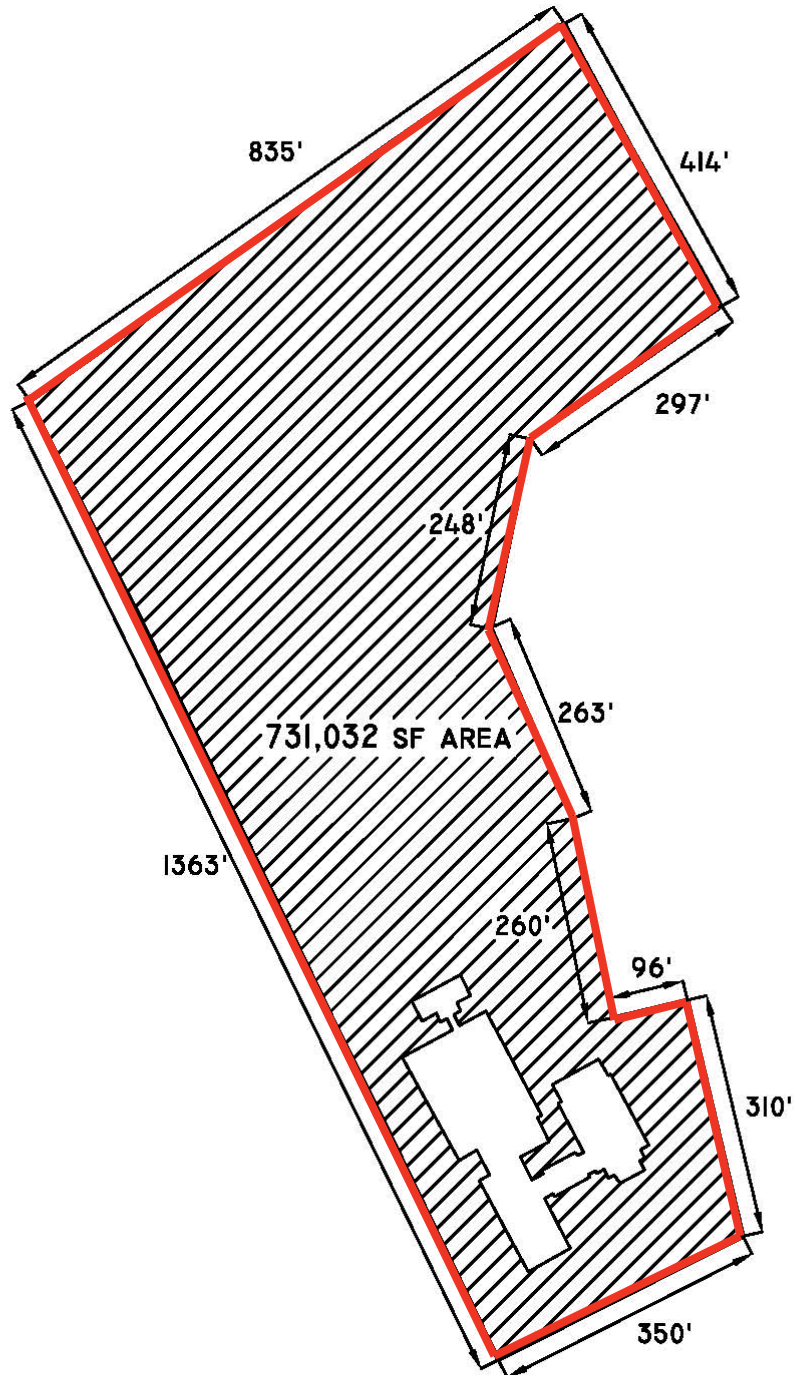
The site is bordered by three roads: Adams Street to the west, Dale Street to the south, and North Street to the east. The main road to the center of town is North Street and a major connector road to Route 27 is Dale Street. Adams Street is a through street has very minor traffic. There are a few residential streets in the neighborhood which are not through-ways and those are in yellow.

Nodes which are important intersection are circled.



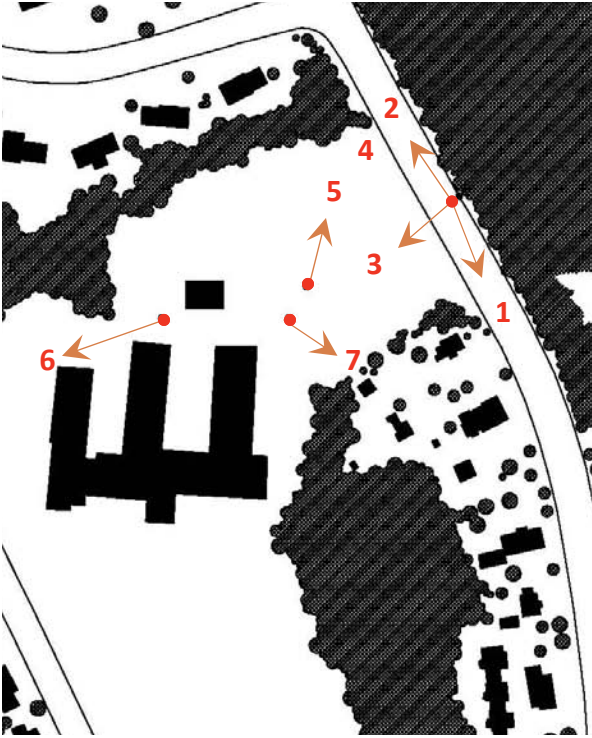
# SITE INFORMATION [CON'T]

## SITE DIMENSIONS



\* For setback dimensions and buildable area, see Regulatory Controls.

## SITE INFORMATION [CON'T]



#1 –  
North Street to the South



#2 -  
North Street to the North



#3 -  
West towards Site from North Street



## SITE INFORMATION [CON'T]

#4 -

Detail Picture of Storm Drain on site



#5 -

View of North-East Corner of Site



#6 -

View of North-West Corner of Site



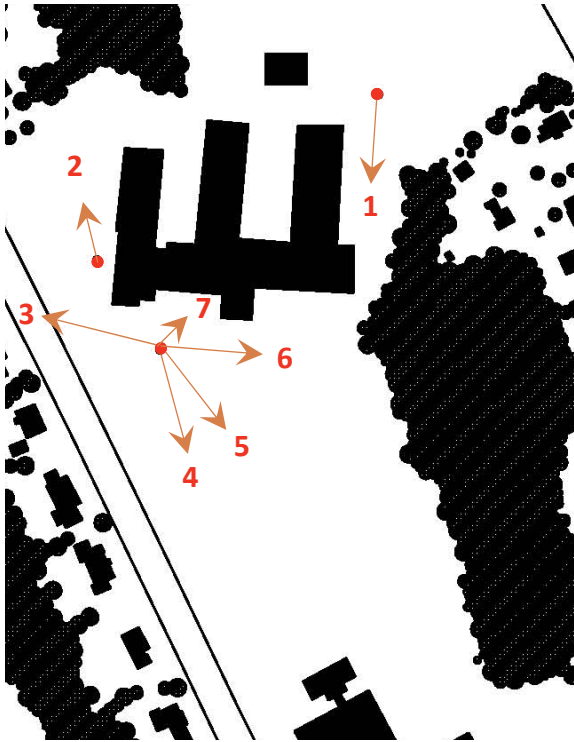
#7 -

View of Adjacent Property





## SITE INFORMATION [CON'T]



#1 –

View South from North-East of Site



#2-

North-Western View of Site



#3 –

View of Western Edge on Adams St.



## SITE INFORMATION [CON'T]

#4—

View from North-West looking South



#5 —

Rear view of Dale Street School



#6 —

Looking towards the East

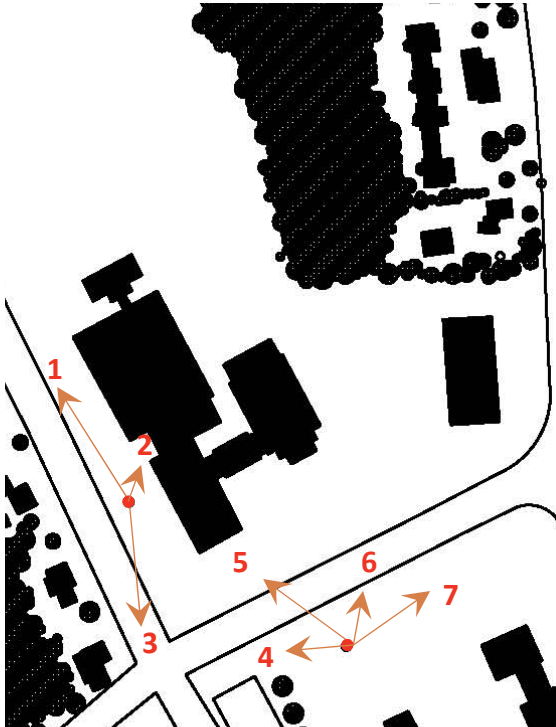


#7—

Entrance of Memorial School



## SITE INFORMATION [CON'T]



#1 –

Looking North on Adams St.



#2 –

Entrance of Dale St. School



#3 –

South-West Corner of Site



## SITE INFORMATION [CON'T]

# 4 –

South-West Corner of Site



#5 –

Looking North to Adams St. & Dale St.



#6 –

Dale St. School and Phaff Center

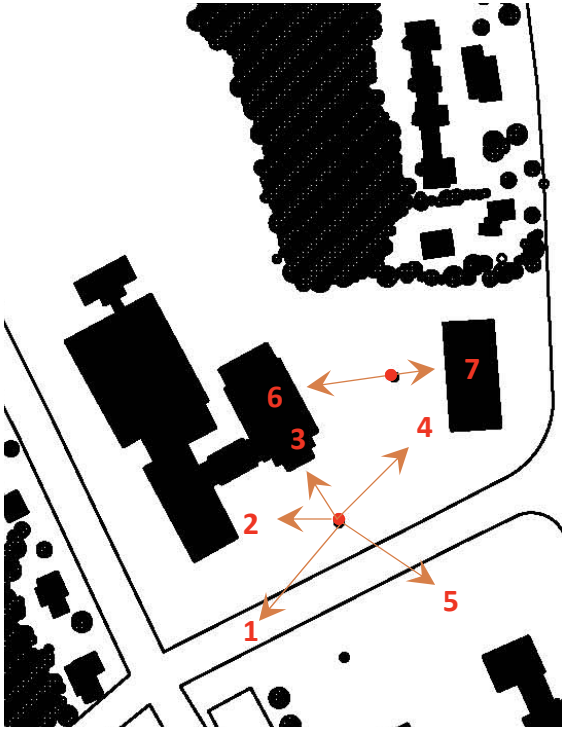


#7 –

View of South-East Corner



## SITE INFORMATION [CON'T]



#1 –

Southern view across Dale. St.



#2 –

View West towards Dale St.



#3 –

Dale St. School Southern Façade



## SITE INFORMATION [CON'T]

#4 –  
Phaff Center



#5 –  
View South to Police Station



#6 –  
East Façade of Dale St. School



#7 –  
West Façade of Phaff Center

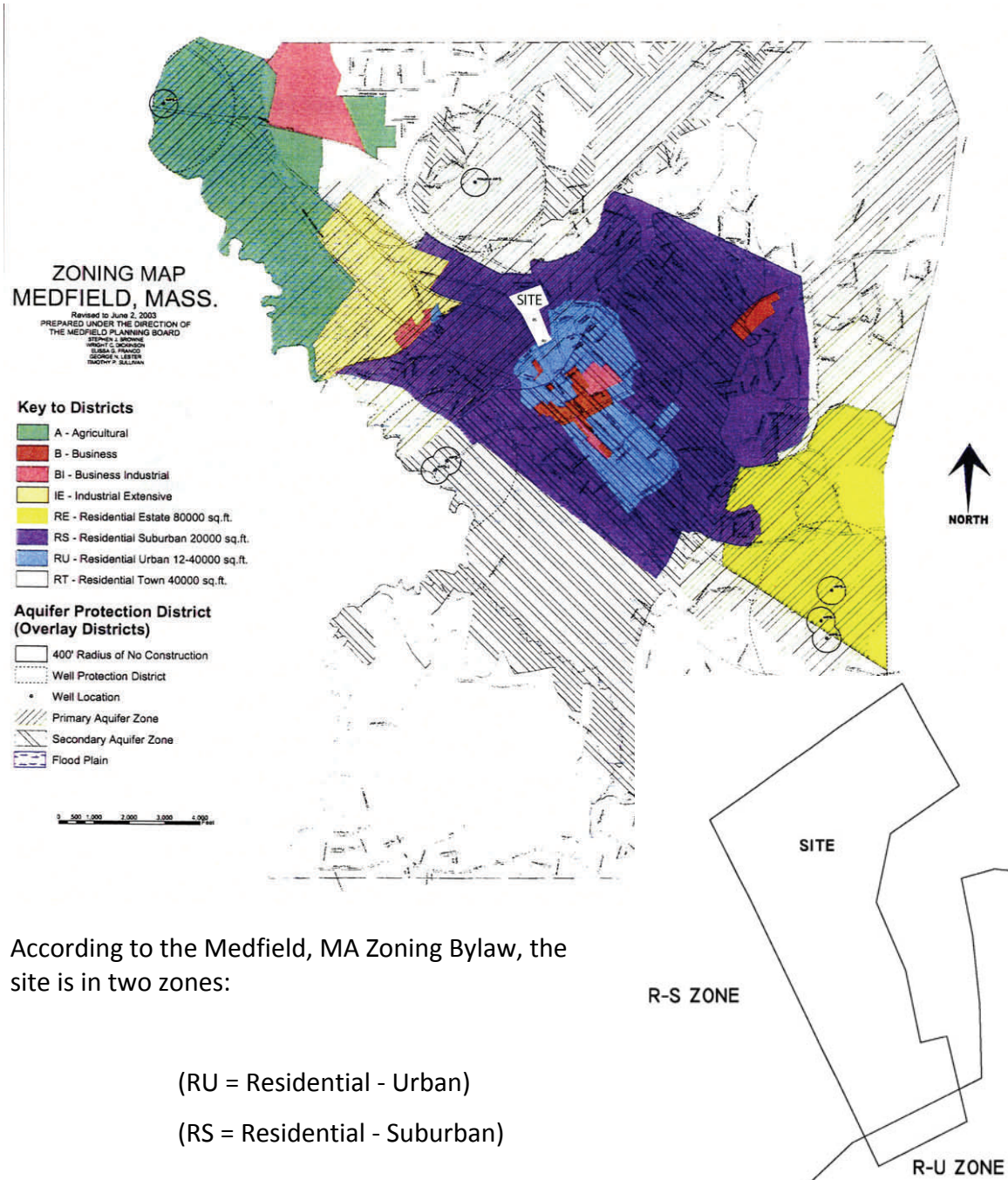




# CHAPTER 7: REGULATORY ENVIRONMENT

## ZONING AND USE

The usage of the building as a public school is under Community Facilities which are allowed in all zones.



According to the Medfield, MA Zoning Bylaw, the site is in two zones:

(RU = Residential - Urban)

(RS = Residential - Suburban)



## REGULATORY ENVIRONMENT [CON'T]

### AREA, HEIGHT, AND BULK REGULATIONS

Based upon the Medfield Zoning Bylaws, the following setbacks and limitations apply to the site:

For buildings in the R-S Zoning District:

- There is a 30 foot setback from the front of the site.
- There is a 12 foot setback on each side.
- There is a 40 foot setback from the rear.

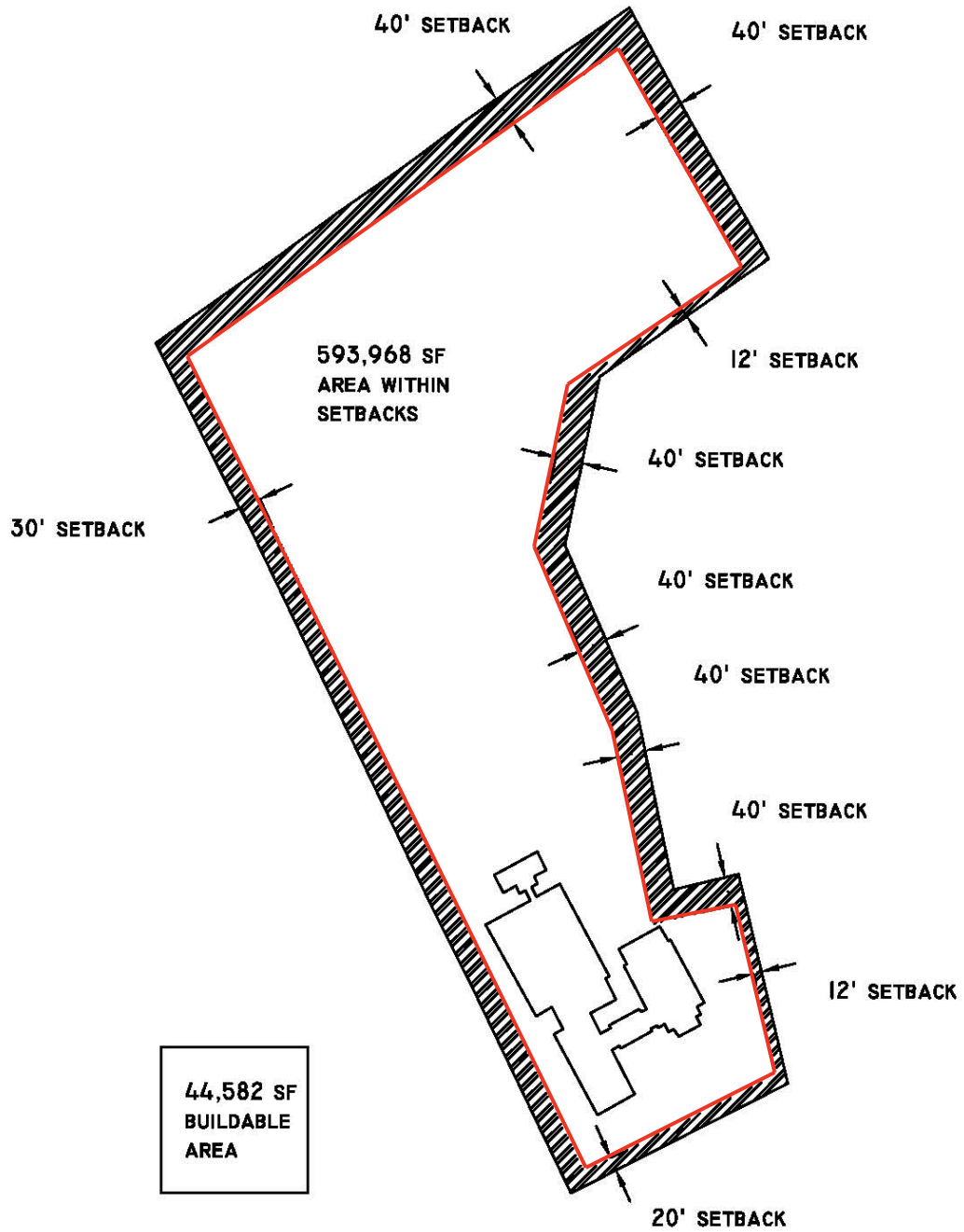
For buildings in the R-U Zoning District:

- There is a 20 foot setback from the front of the site.
- There is a 12 foot setback on each side.
- There is a 30 foot setback from the rear.

The maximum height of the building is 35 feet above the ground line.

The maximum lot coverage is 20% of the total area of the site.

# REGULATORY ENVIRONMENT [CON'T]



## REGULATORY ENVIRONMENT [CON'T]

### OCCUPANCY CLASSIFICATIONS

The program for the building is under the following occupancy classifications as defined by the International Building Codes :

- A-1 Areas of Assembly such as auditoriums, gyms, etc.
- A-2 Areas of Assembly with food/beverage such as cafeterias, etc.
- E Educational Facilities for six or more students.

\*For an area to be under A, it must for 50 or more people and >750 SF.

\*Each classroom needs two exits with one to the exterior.

### CONSTRUCTION CLASSIFICATIONS

Educational Facilities shall be of Type 1-A, 2-A, 3-A or 5-A construction.

Non-combustible materials for Types 1 and 2 include masonry, steel, and concrete.

Combustible materials for Types 3 and 5 include wood and plastics.

### ACCESSIBILITY

There must be single unobstructed route from site into building spaces.

At least one major entrance to a building must be accessible.

At least 60% of all entrances/exits must be accessible.

There must be at least 2% of all parking handicapped accessible.

For every 6 accessible spots there must be one van-access space with an 8 foot isle.

There must be 5 foot isles in the parking lot for handicapped access.

For assembly areas, areas of 30x48" shall be provided for handicapped seating.

There shall be a variety of options in all assembly areas.

At least 25% of all space in any dining area shall be accessible.

At least 5% of all surfaces shall be 27"-34" high.

The number of accessible toilets depends on the occupancy.

There must be a 30x48" clearance in front of the sink.

Elevators must be a minimum of 5'-8" x 4'-3" in area and the door at least 3 feet wide.

Avoid lifts!

## REGULATORY ENVIRONMENT [CON'T]

### PARKING REGULATIONS

Schools must have two parking spaces for each classroom minimum.  
Assembly spaces must have one parking space provided for each 4 seats.  
If both uses are on one site, the larger number must be used.  
Parking spaces must be within 500 feet of an entrance.  
For employees, parking spaces must be within 800 feet of an entrance.  
There must be a minimum of one parking space per employee.  
There should be one space provided for each 50 SF of the building area.  
There shall be no parking/loading within 5 feet of the lot lines.  
There shall be no parking within the minimum front lot setback.  
Screening/buffers are needed on sided facing the side/rear of the lot.  
Bumpers are needed on the sides of the pavement.  
No lights may face the street or adjacent properties.  
No entrance can be within 150 feet of intersecting street corners.

### EGRESS

Exit paths must be at least the same width or wider as they go towards exits.  
For all means of egress, there must be a minimum height of 7'-6".  
Ramps can have a maximum 1:12 slope for means of egress.  
Ramps must be at least 44" wide and at least the same width as the corridor.  
Minimum ramp width for non-egress circulation is 36".  
Landings at the top/bottom of ramps must be at least 60" wide.  
Landings must be provided at any change in direction for ramps.  
There is a maximum distance of 250 feet to any exit from within the building.  
There is a maximum length of 20 feet for any dead-end corridor.  
The maximum length can also be only up to 2 ½ times the width of the corridor.

### FIRE PROOFING & RATING

All Types require active fire protection systems.  
Fire-Ratings for all occupancies depend upon the construction classification.  
Educational Facilities require manual fire alarms.  
Manual fire alarms must be connected to smoke detectors and sprinklers.  
Fire alarms must be within 5 feet of each exit and within 200 feet on one another.  
Fire alarms must be 42" to 48" above the floor.  
Educational facilities require audible and visual alarms.

## REGULATORY ENVIRONMENT [CON'T]

### Medfield Land Subdivision Rules & Regulations

- 3.1.4 Easements must be at least 20 feet wide and passable by vehicle.  
No buildings or sewer systems are allowed within easements.
- 5.2.1 Non-through ways shall be no longer than 500 feet from end to turnaround.
- 5.2.1.5 Curbing must be sloped granite with appropriate end pieces.
- 5.2.1.6 Driveway opening cannot be within 20 feet of a catch basin or hydrant.  
The radii of a drive wall should be the width of the sidewalk.  
Driveways should be more than 12 feet wide.
- 5.2.1.11 Tree plantings shall not be within 20 feet of intersections/driveways.  
The following trees may not be planted without the tree wardens approval:
- Sugar, Red, and Norway Maple
  - Scarlet or Red Oak
  - London Planetree
  - Shademaster Locust
  - Marshall's seedless ash
- 5.2.3 Manholes and easements must be within 300 feet of one another.
- 5.2.4.2 Hydrants must be within 500 feet of all buildings.
- 5.2.5 Each building must be connected to the public sewerage system, if:  
-within 3,500 feet of public sewerage system.
- 5.2.6 All gas and electric utilities must be underground

## CHAPTER 8: PRECEDENT ANALYSIS

The following pages examine several projects which are exemplary for one or more of my architectural intentions. Herman Hertzberger designed several schools, including the De Polygon and De Evenaar schools; his goals were to provide healthy social environments for children which are designed to be flexible for a variety of social activities. Japanese architecture is wonderful for its logical constructional order and flexible, rational design which is why it is explored in this section. In addition to these main precedents, there are also some examples of interior spaces which use kid-friendly materials to provide a welcoming, safe space.



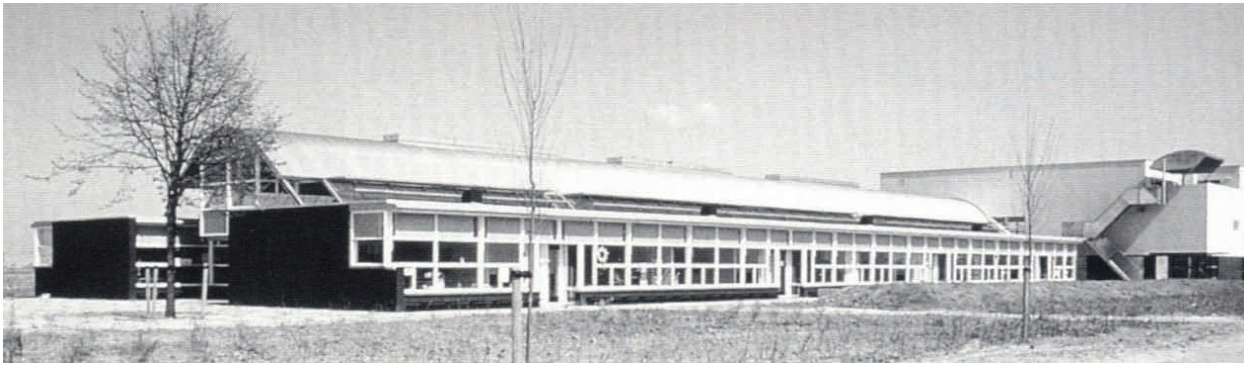
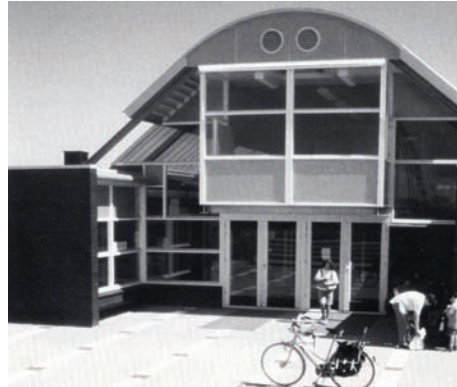
### **Apollo Schools by Herman Hertzberger**

The Apollo Schools of the Netherlands are a set of Montessori-Style Schools for younger children. The schools focus on creating social spaces and interactive learning areas for children. Herman Hertzberger has created several social spaces in each school for varying levels of intimacy. Each school has a central meeting area or “amphitheatre.” The schools all have similar programs yet are all different due to site and individual needs of each school. Herman Hertzberger creates modularized classrooms with ‘structural clarity and transparency.’

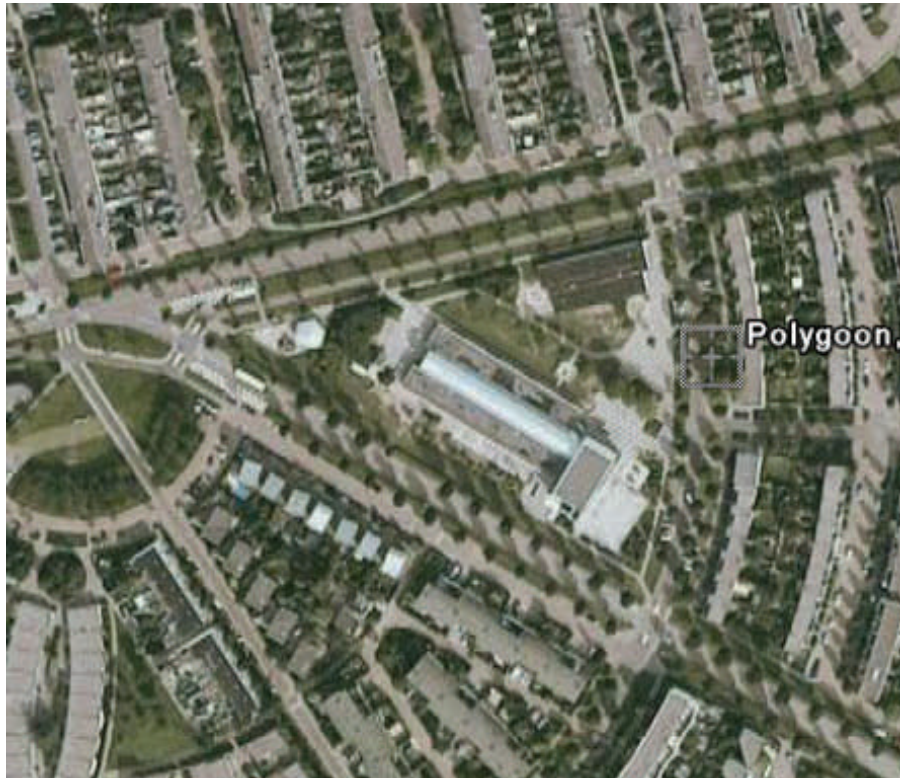
## PRECEDENT ANALYSIS [CON'T]

### De Polygoon Kindergarten and School Almeria (1990-1992)

The building is split into two masses, one mass for administration and the gym, & one for the classrooms. This building is scaled-down for children with a low, horizontal massing.



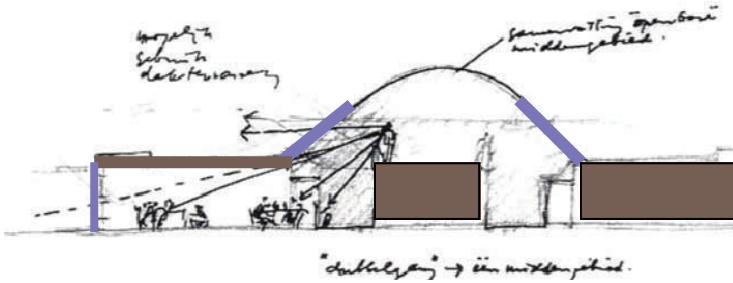
The building was massed to resemble the linear qualities of the neighborhood planning.



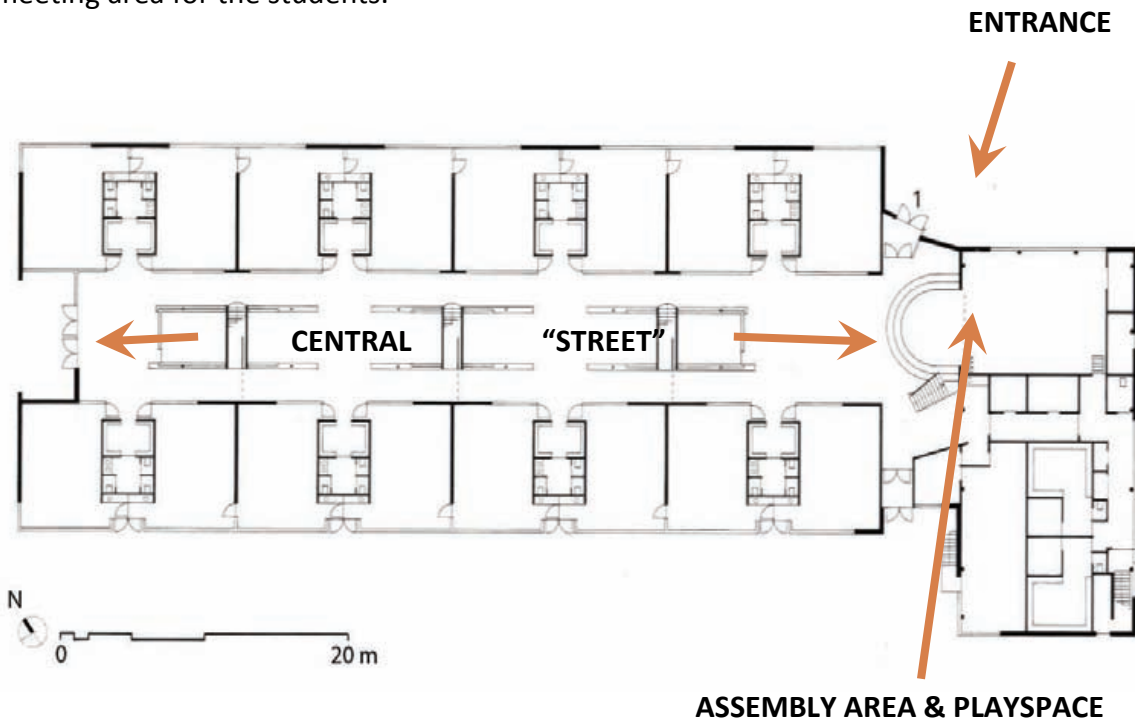
(See: van Bergeijk)

## PRECEDENT ANALYSIS [CON'T]

Light and ventilation is also very important for the school as seen in this diagram. There is a skylight which runs along the central corridor for day-lighting.



There are flexible rooms in the central corridor to supplement the classrooms. There is also a central meeting area for the students.



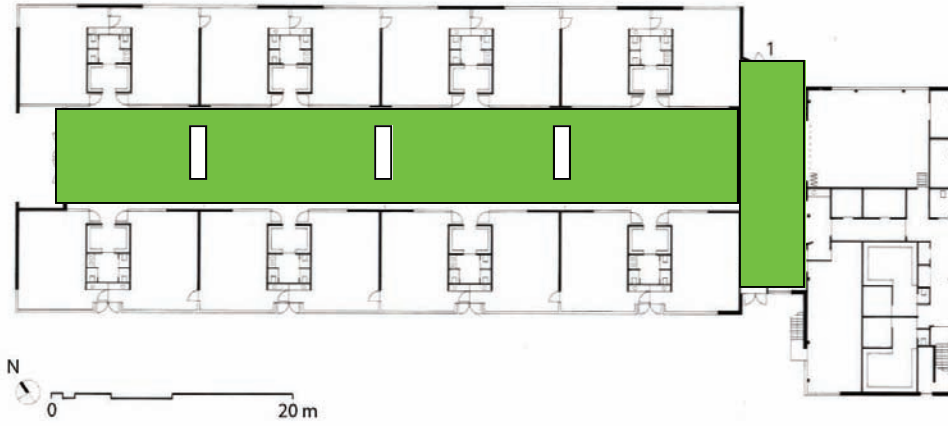
There is a clear linear plan with a double loaded corridor to serve as a flexible social space. It ends at a special assembly and play area. The classrooms are paired and share bathrooms and storage space. All have direct access to the exterior. All special spaces are in the are in the two story massing.



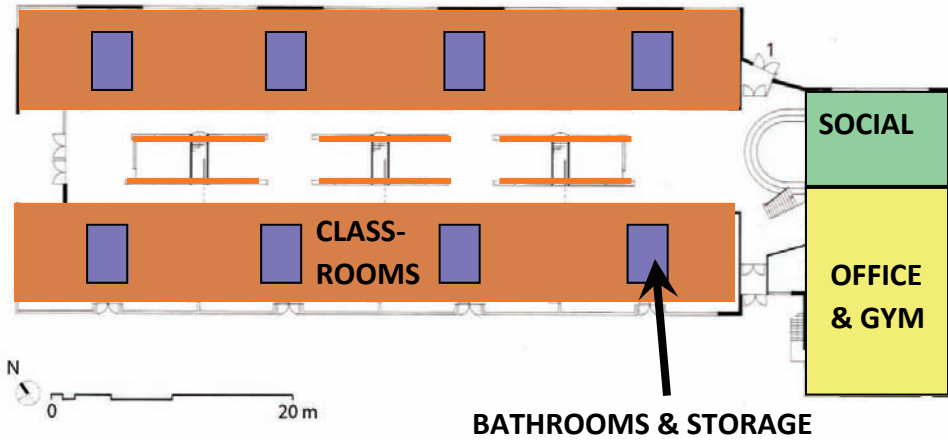
# PRECEDENT ANALYSIS [CON'T]



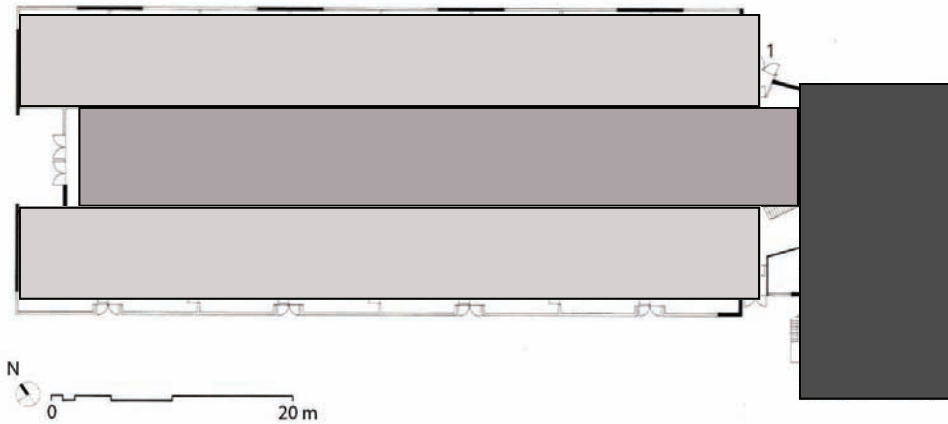
CIRCULATION



USE



MASSING

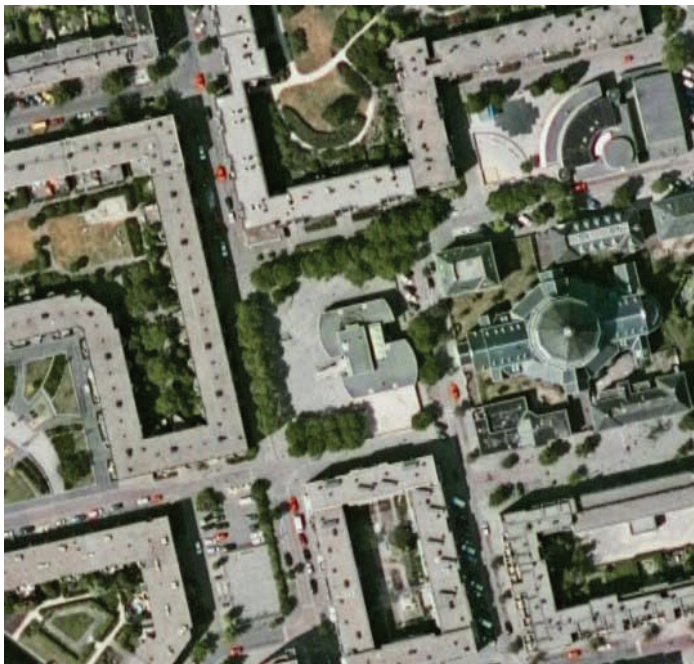


## PRECEDENT ANALYSIS [CON'T]

### De Evenaar Kindergarten and School; Amsterdam (1984-1986)

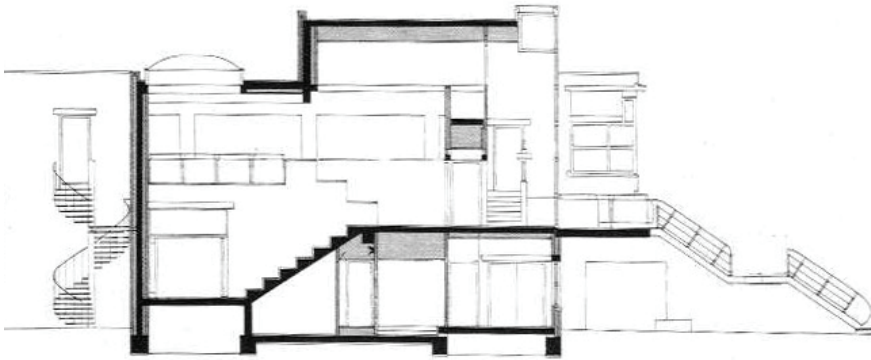


Due to a small site, the building was split into two levels, with maximum amounts of exterior light brought into the classrooms with glass curtain walls on the street site and back side of the school.



## PRECEDENT ANALYSIS [CON'T]

The modular classrooms encompass the central meeting space. Three classrooms are on each floor and the building becomes a split-level massing.



0 5 m

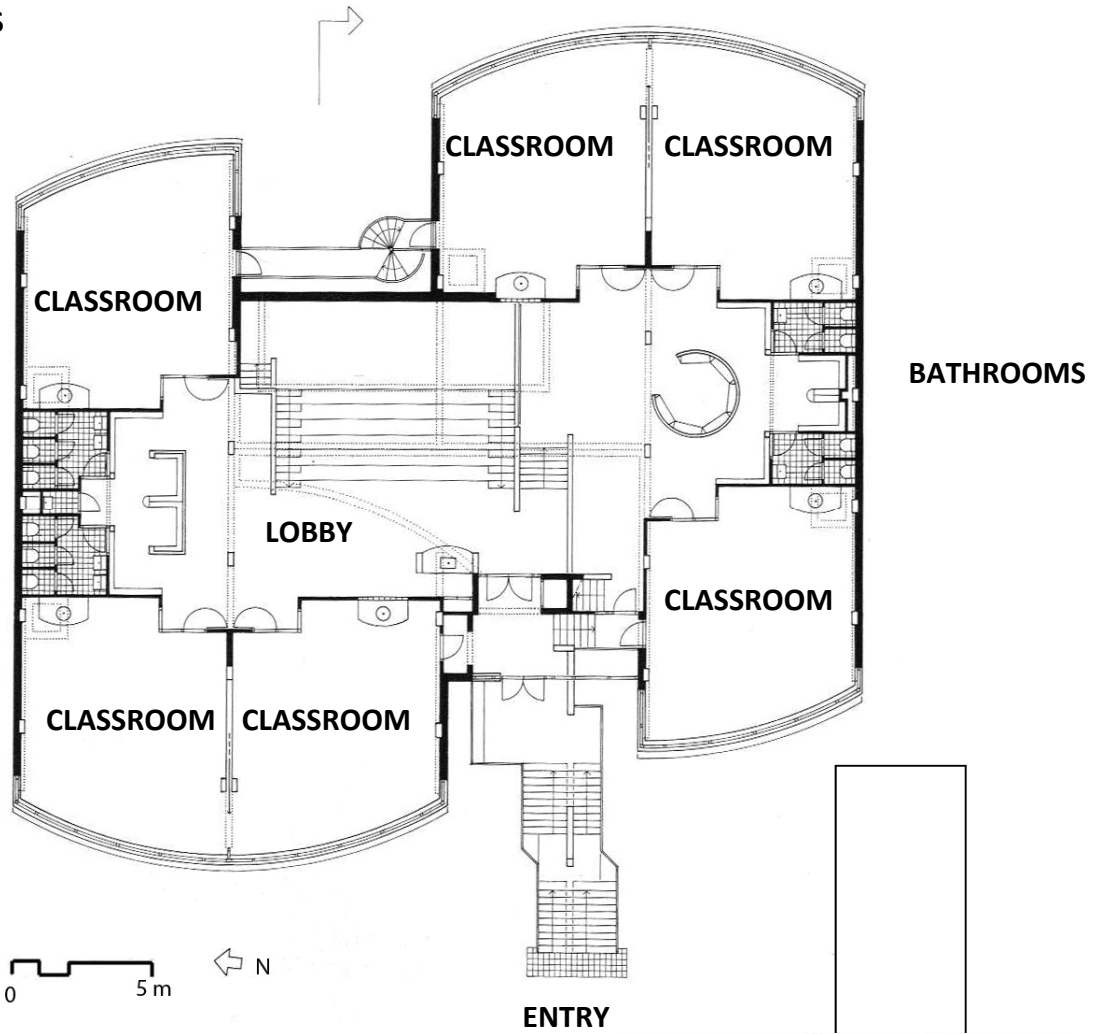


Light-Filled Classrooms with windows at eye-level for children.

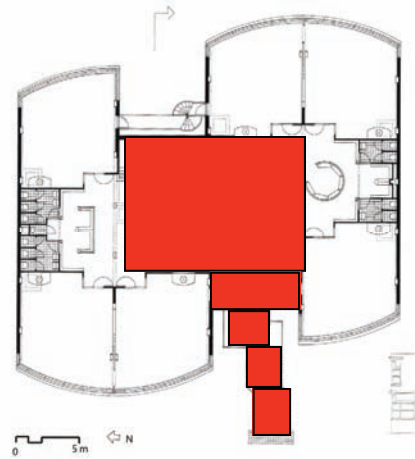


# PRECEDENT ANALYSIS [CON'T]

## PLANS



USE

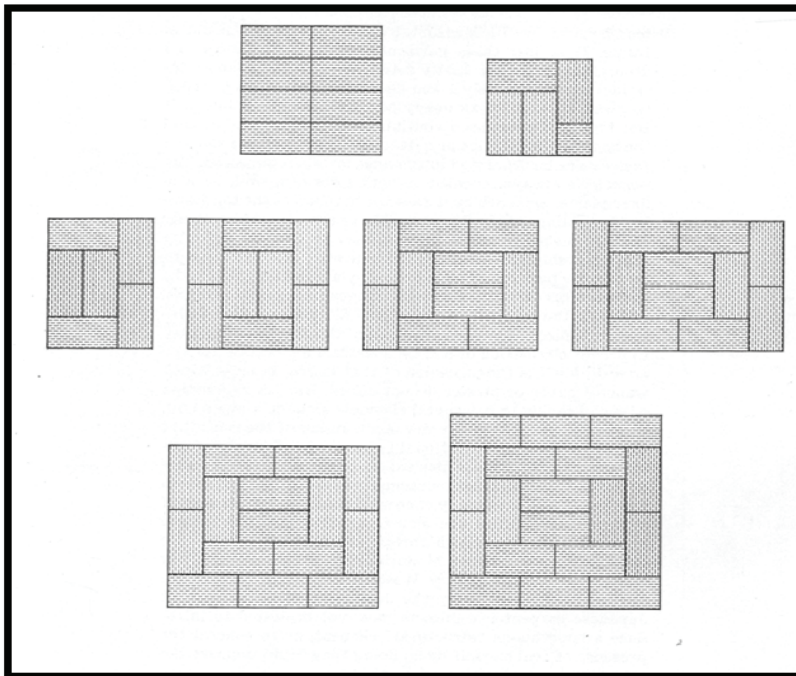


CIRCULATION / SOCIAL

## PRECEDENT ANALYSIS [CON'T]

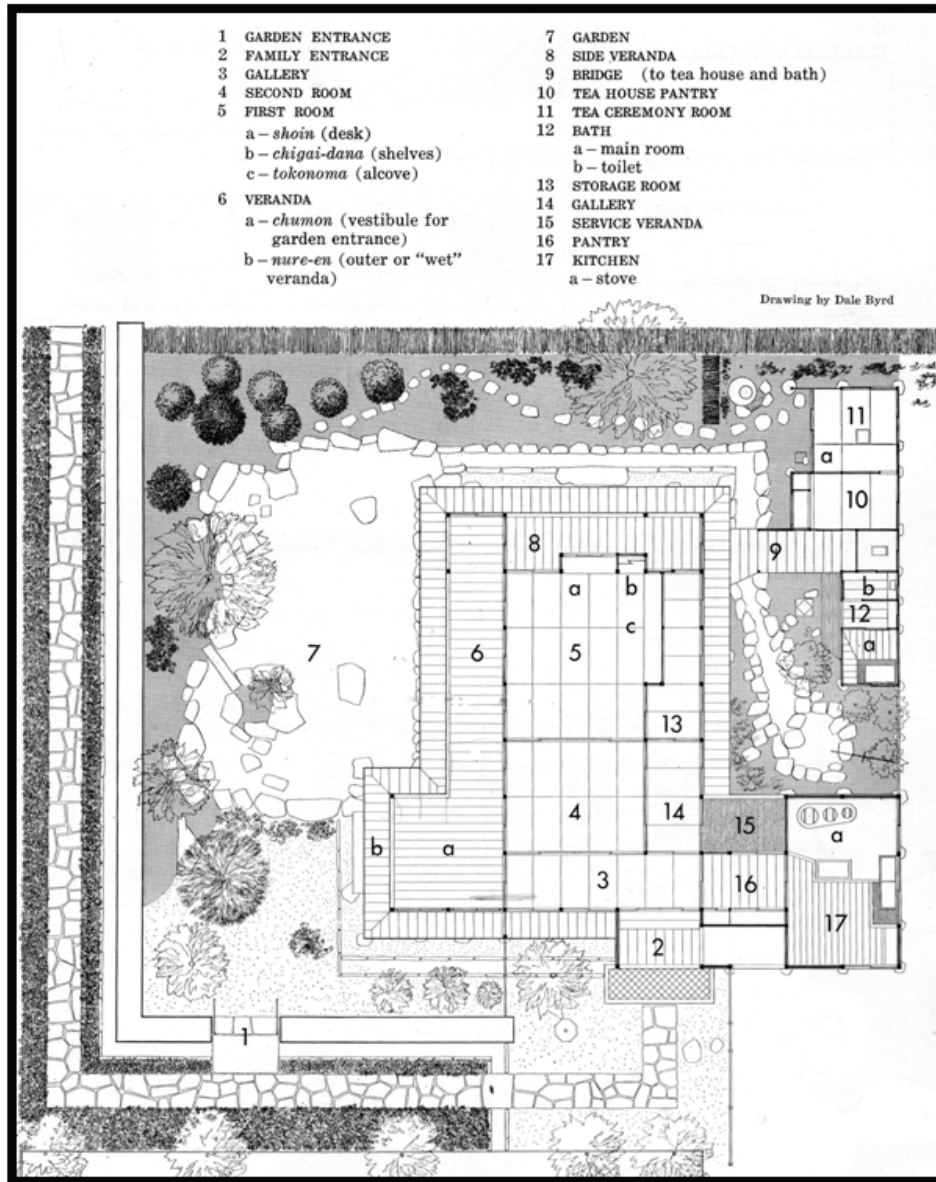
### Japanese Exhibition House; New York Museum of Modern Art

Japanese Architecture is very flexible and adaptable. Most domestic architecture in Japan is modular and based upon a Tatami mat. All spaces are created through the organization of these mats. This helps to organize structure based on the 1:2 mat module. The mats are literally placed on the sub-floor and taped together. They decide the placement of columns and interior walls which are also modular.



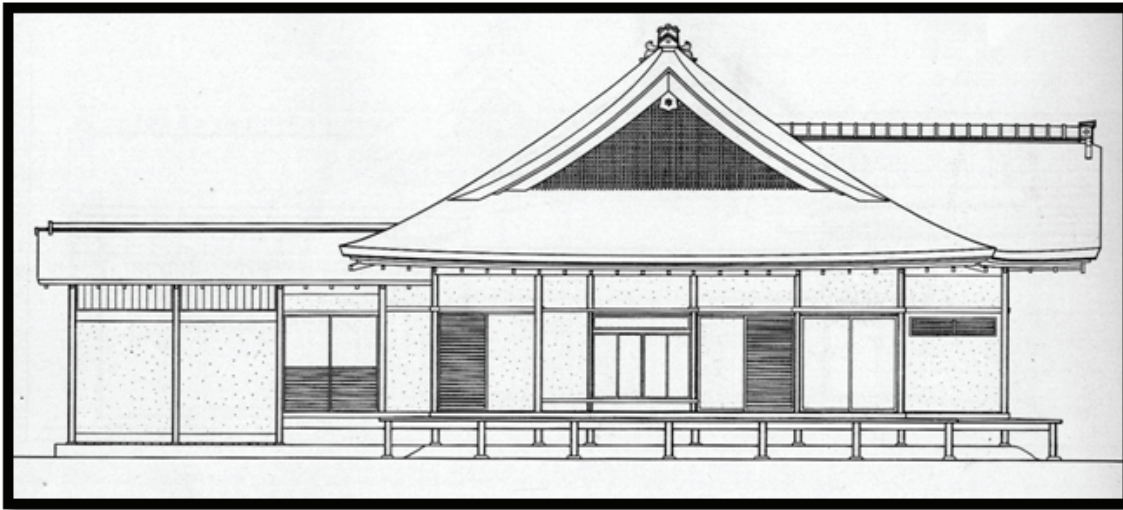
The MOMA exhibition house is a standard Japanese house created for the New York Museum. It shows its constructional basis, flexibility, and sequence of space from interior to exterior.

## PRECEDENT ANALYSIS [CON'T]

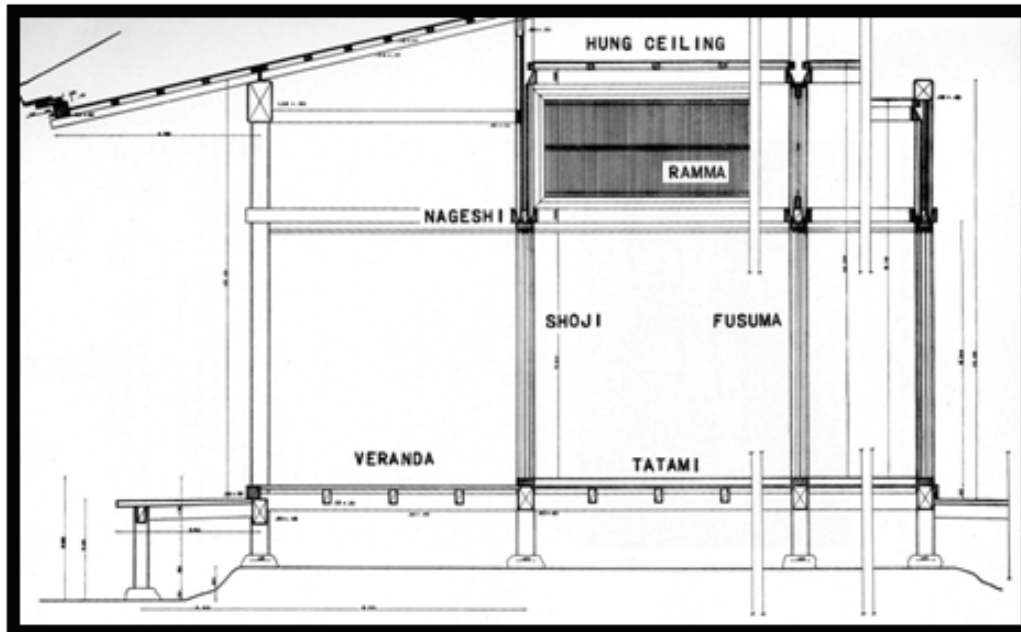


The module is clearly seen in the floor plans for the exhibition house. The spaces are flexible and manipulations of the module and are adaptable for a variety of uses. There is also a clear interaction of the exterior and interior spaces.

## PRECEDENT ANALYSIS [CON'T]



There is a clear constructional order of the building, it is very simple and rational. The sliding partitions (Shoji), and clerestory lights (Ramma), play an integral role in the construction of shelter. It is clearly a wooden construction. The house is disjoined from the ground and only touched by posts which are a continuation of the column supports for the structure.



## PRECEDENT ANALYSIS [CON'T]



The plasticity of the construction can clearly be seen with the interior. Movable partitions and interior clerestory lights allow for a smooth transition between interior and exterior spaces. There is a juxtaposition of natural and man-made features which complement one another.





## PRECEDENT ANALYSIS [CON'T]

### LOFT PRECEDENTS



Joan Rodon,  
Barcelona Preschool

There are several spaces for children that best exemplify the importance of the safe usage of materials and tectonics, as well as scale for children. These spaces, which also include lofts, provide spaces just for children. They are exciting, colorful, and provide children with an opportunity to be involved in the built environment. They are truly made just for children!



ArchitectureIsFun, Inc.;  
Japan Preschool

## PRECEDENT ANALYSIS [CON'T]

### PRECEDENTS FOR INTERIOR SPACES AND MATERIALS



Carlin Springs Elementary; Arlington, VA  
Grimm & Parker Architects

Notice the quality of light in the reading space and the colorful interior. Children have a variety of spaces to learn, read, and play in groups, pairs, or individually. Blue is actually used as a soothing color, and seen in all three spaces.



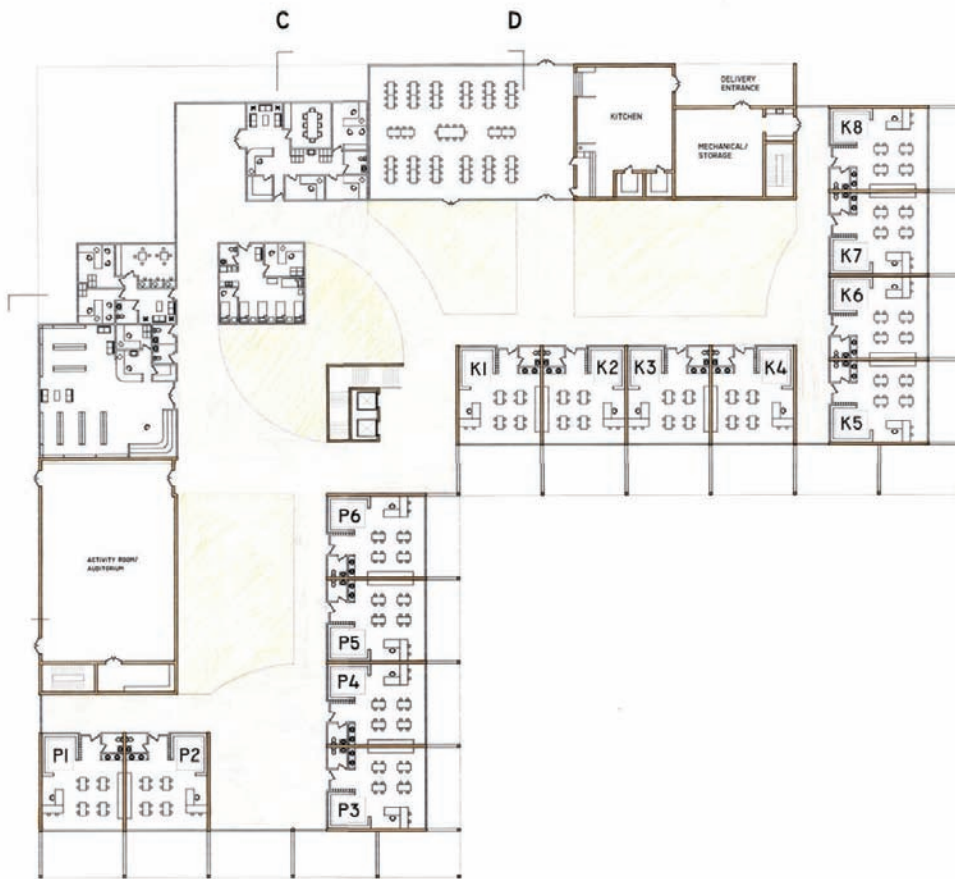
Granger Community Church; Granger, Indiana  
ArchitectureIsFun, Inc.





This sketch represents the idea that each classroom should have an exterior space and a low scale. The interior space should connect with the exterior through a glass curtain wall with double doors at minimum. From early on, the idea of having a concrete slab floor was first shown in sketches. Rain screen systems were also looked at but were not implemented in the final design due to the context.

## DESIGN PROCESS/SKETCHES (CON'T)



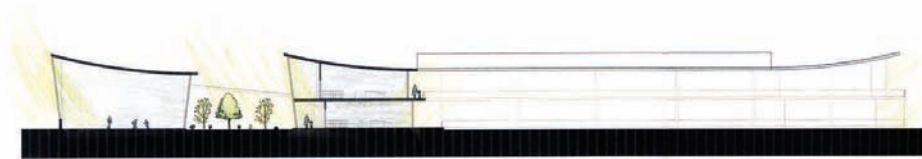
The plan began as an L-shape but with interior courtyards being used for sunlight. The entry was at the top left of the site and the only entrance. The administration and resources were next to the entrance as in the final design. There were paths through the courtyards on the lower level which connected to the classroom hallways along the East and South facades. A central stair and elevator was not at the main entrance and could not be seen right at a visitor entered which caused issues with circulation. The vast area needed for courtyards made this scheme hard to place on the site and the spread out areas made for a complex circulation system.

## DESIGN PROCESS/SKETCHES (CON'T)



The second floor of this mid-review scheme is complicated with long corridors branching out from the vertical circulation. The second floor did provide the opportunity for students to go straight from their classrooms to an exterior space however, this could be a problem since the students have a more rigid schedule with classroom activities; having direct access to the exterior could distract students from paying attention in class. Again, everything is very spread out and the courtyards weren't needed for light or ventilation.

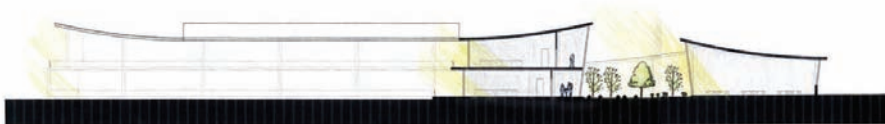
## DESIGN PROCESS/SKETCHES (CON'T)



SECTION A



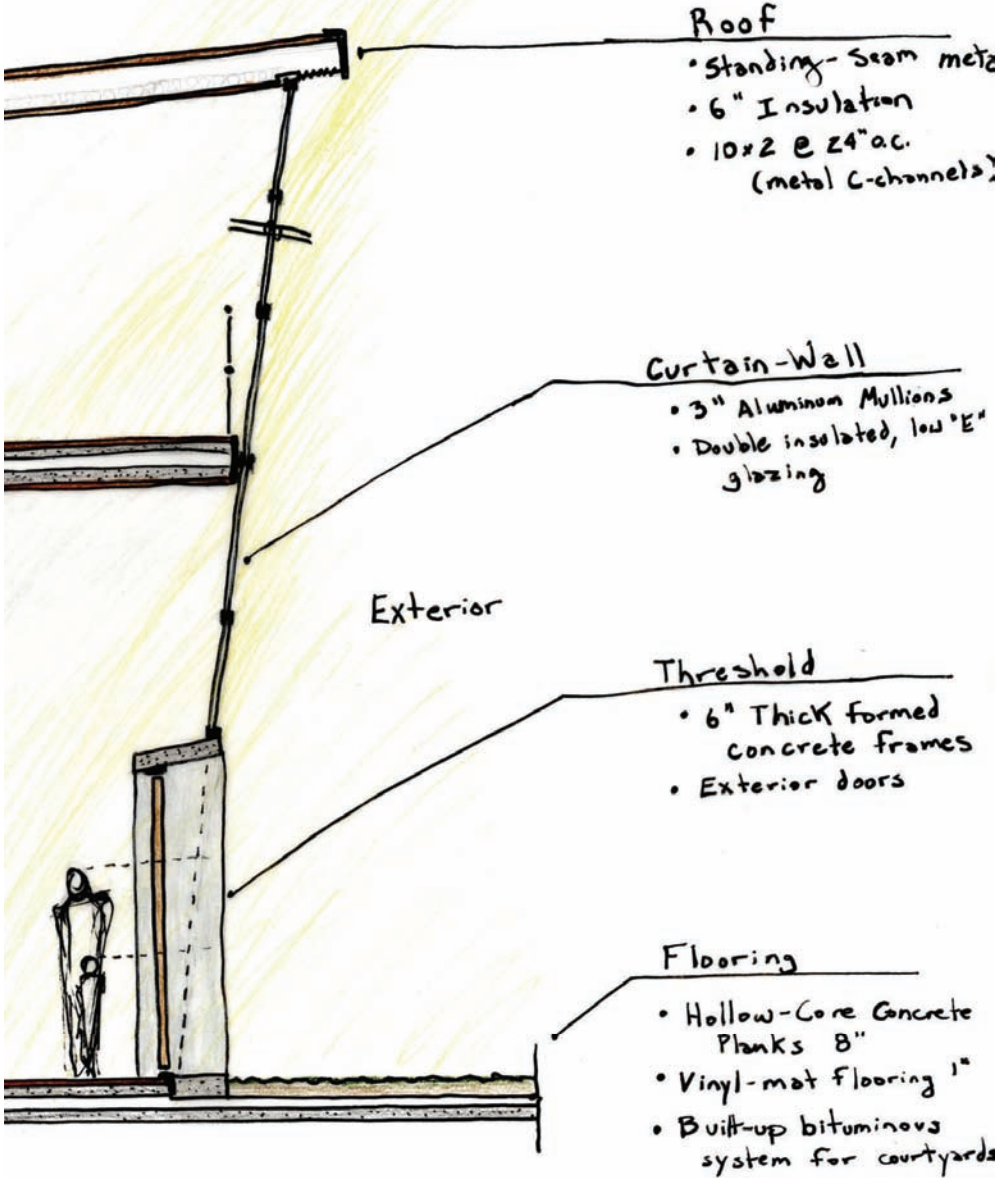
SECTION C



These sections through the building show a playful character to the building however the roof slope is very unpractical. The scale is also quite large for younger students on the second floor due to the roof heights. The paths through the courtyards showed how the space needed to be condensed, and the circulation simplified.

As seen on the right, sectional properties and the tectonics of the building were being looked at in more detail and the curtain wall system, although no longer sloped, basically stayed the same for the final design. The roof materials changed but the concrete planks also stayed the same.

# DESIGN PROCESS/SKETCHES (CON'T)



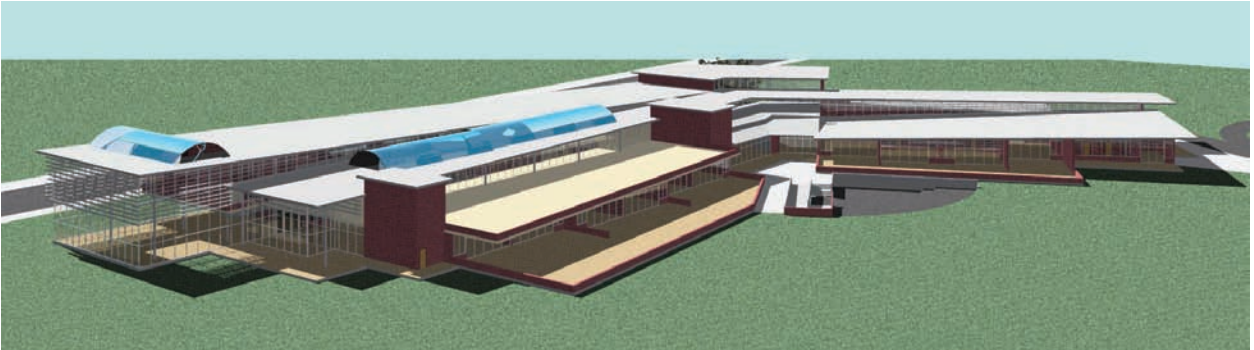
SECTION

1/2" = 1'-0"






## CHAPTER 10: INDEPENDENT PROJECT DRAWINGS



The following pages contain the final independent project drawings:

- Site Plan
- Diagrams
- Basement Plan
- Ground Floor Plan
- First Floor Plan
- Ground Floor RCP
- First Floor RCP
- Elevations
- Building Sections
- Detail Wall Sections
- Renderings of Interior Spaces
- Renderings of Exterior Spaces

## INDEPENDENT PROJECT DRAWINGS (CON'T)



The school shares the site with the Dale St. School at the southern end of the site. In order to have a strong visual connection with that school and to strengthen the border between the school property and exterior neighborhood for safety, the southern end of the school was extended. The service entrance and school bus entrance is along the western edge of the site and the schools exit on the eastern edge to the main road which attaches to the center of town. The parent drop-off and faculty parking areas are off of the eastern edge of the site where there is a side entrance by the main office. The students are dropped off by the buses to the North.

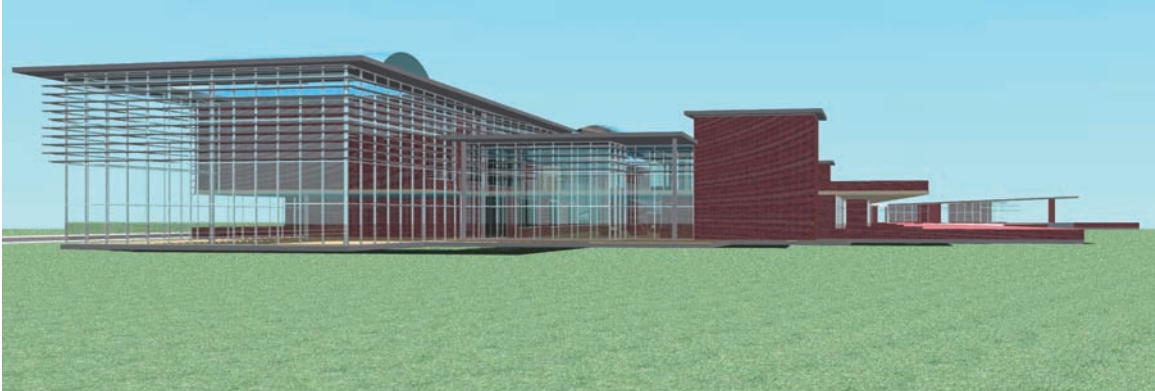
By having the entrances and services along the Northern and Western edge of the building, the Southern and Eastern edges are open to classroom patio areas with more direct light in the mornings, which is the main time students will be in school. On the interior of the site at the center of the school is an amphitheatre where students and the outside community can come together for performances and special events.

A strong connection is seen between the schools providing a strong sense of an inner campus with the playground between the two schools. The future opportunity for the schools to physically connect is also available due to the orientation of the new school.

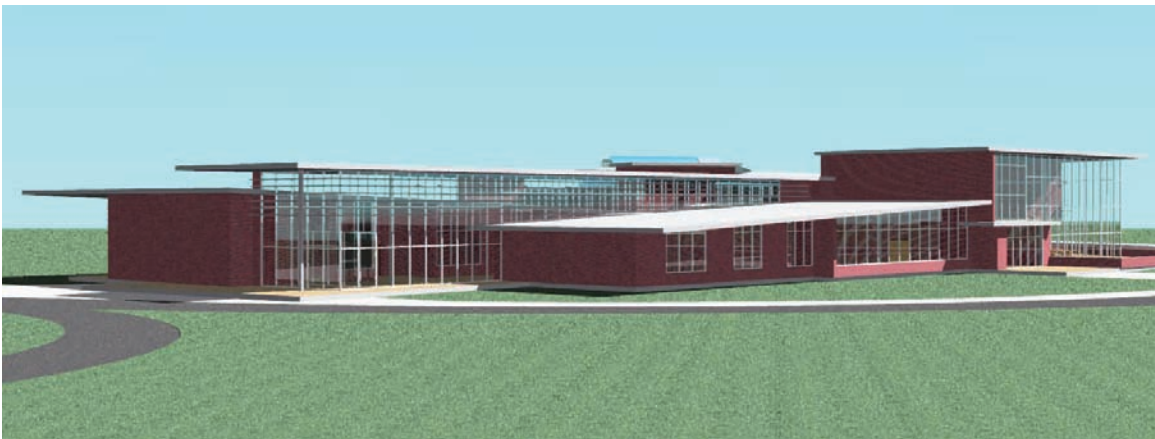
# Site Plan

# Site Plan

## INDEPENDENT PROJECT DRAWINGS (CON'T)

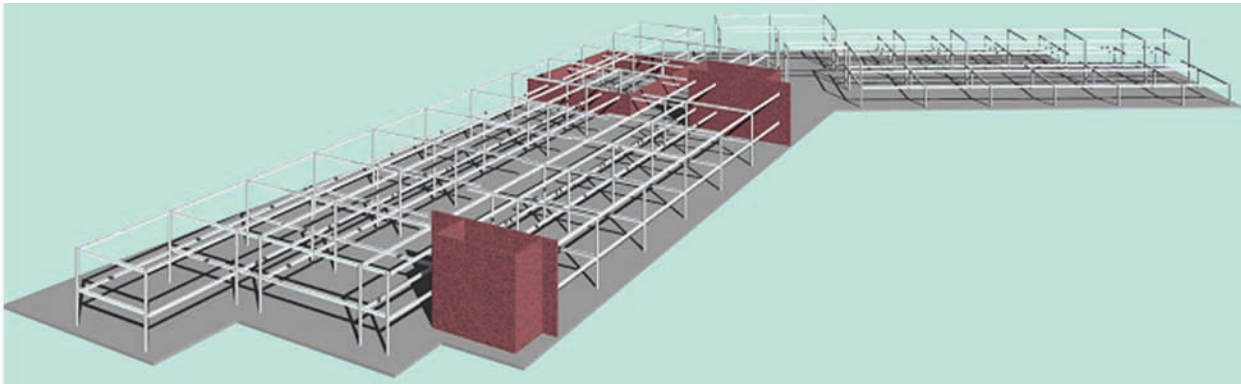


The above rendering shows the southern end of the school protruding towards the existing Dale St. School. This is where the school can expand in the future.



This rendering shows the side entrance to the North-East of the site by the parking area and drop-off zone.

## INDEPENDENT PROJECT DRAWINGS (CON'T)



The concept was constantly referred to in order to keep the ideas simple and consistent when designing the building. Three legs on either end of the central space are represented in mass and also a simple modular structure which can be put up quickly while school is not in session.

The systems are integrated with this same concept branching from the central space in the basement, horizontally across the building in each leg, and upwards through vertical shafts for the upper level of the building.

Each of the legs represent a different program which is also represented in mass. Circulation is along the center of the program in the building and also provide a smooth flow from one end of the building to the other as shown in the concept diagram. Vertical circulation is off of the main route in order to keep to smooth flow of the horizontal circulation. To help along with this is a ramp in the southern end of the building connecting the ground floor and first floor. The main stairwell is located at the center of the building.

diagrams



diagrams

## INDEPENDENT PROJECT DRAWINGS (CON'T)



This rendering depicts the ramp from the ground level which aids the smooth circulation through the center of the building connecting the two ends of the building to the outside environments.



The ramp from the upper level.

## INDEPENDENT PROJECT DRAWINGS (CON'T)



The following pages contain the floor plans of the building.

The basement plan shows the central area for the HVAC equipment and extra storage space. The piping and ducts run horizontally from this area through the crawl spaces on either end. The vertical shafts run upwards where needed from the horizontal runs. To get to the basement from the ground floor is one of the fire stairs, a large elevator, along with the service entrance on the Western edge. This includes stairs, a vertical shaft and an enlarged opening for equipment.

On the ground floor there are three main access ways: the bus drop-off on the North with the central meeting area and cafeteria, the side entrance for visitors and faculty which is attached to a corridor with the administration and resource areas and nurses office, and the southern entry for recess which connects to the playground. The kindergarten classrooms begin in the northern half of the building on the eastern edge and continue in the southern half of the building. The preschool is on the western edge. Each group of classrooms have their own exterior areas for classroom activities. All classrooms and most public spaces have Nana-Wall glass curtain-wall systems with folding doors which provide instant access to the exterior. These are also used along the North of the cafeteria where there is another exterior patio.

On the upper level, connected by two fire stairs on either end, and main stair and a ramp, are the first grade classrooms and an exterior patio for class activities. The level overlooks the central space on the Northern end and the Southern exit as well.

# Basement floor plan

# Basement floor plan

ground floor plan

ground floor plan

first floor plan

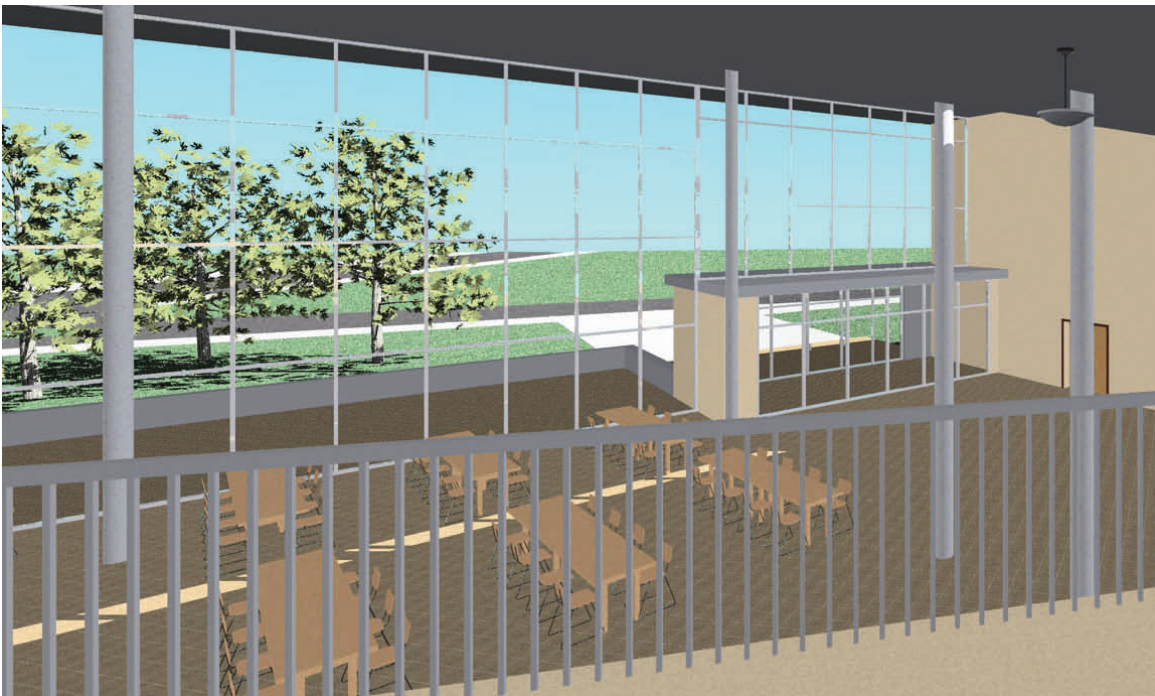


first floor plan

## INDEPENDENT PROJECT DRAWINGS (CON'T)



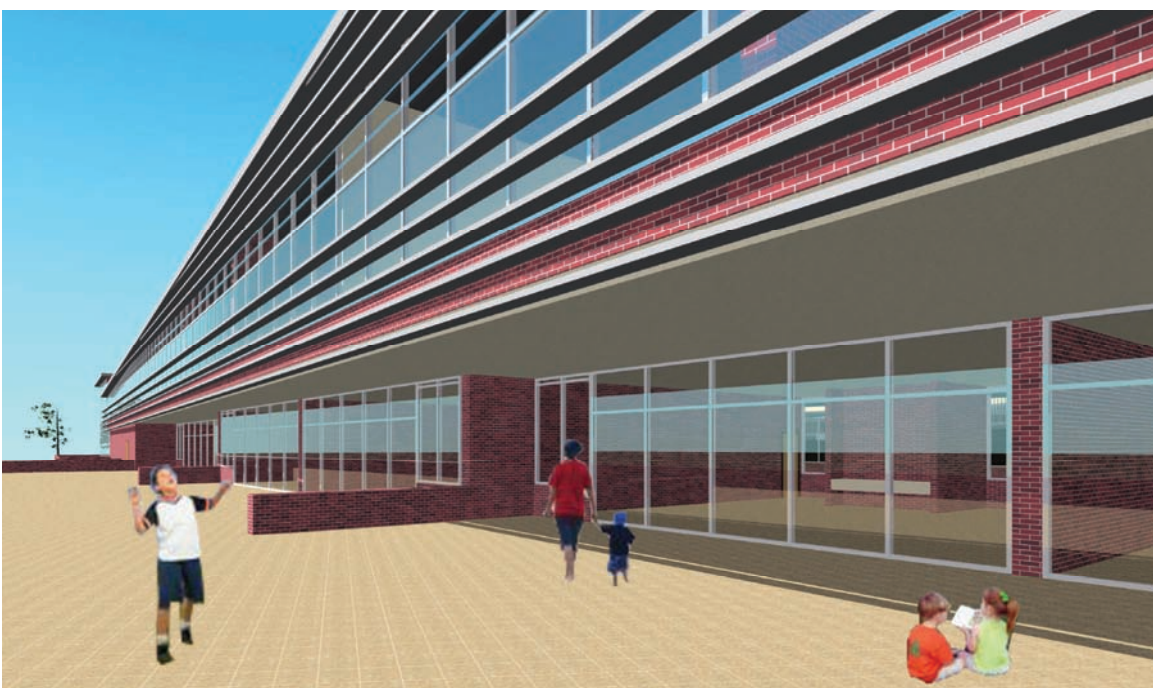
The central space can be seen here from the bus entrance and the upper level. It is filled with light and has a dynamic sense of space.



## INDEPENDENT PROJECT DRAWINGS (CON'T)



The classroom has a smooth sequence from interior to exterior with only the Nana-Wall system as a barrier.

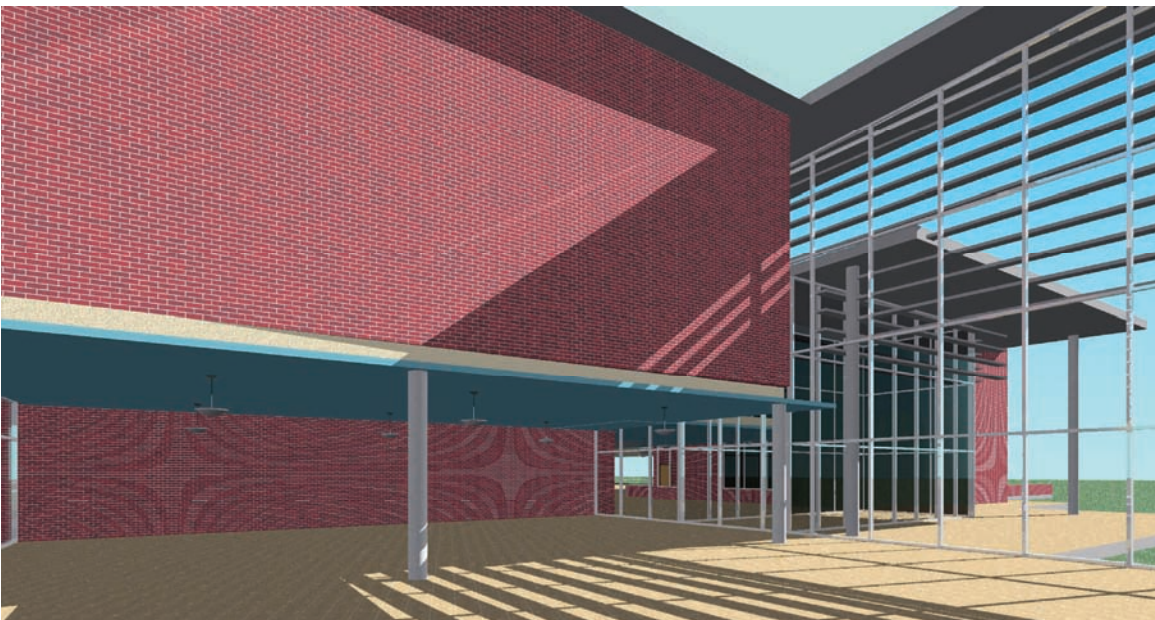


The exterior patio area for the preschool children.

## INDEPENDENT PROJECT DRAWINGS (CON'T)



This rendering shows the administration wing to the North including the nurses office and resource office on the right.



The interior space at the southern wing creates a green-house space where students can learn about the sun, plants, and how things grow.

## INDEPENDENT PROJECT DRAWINGS (CON'T)



This is the space under the ramp which can be used for a variety of activities on a rainy day. The structure of the ramp becomes a structure for play. It separates the two groups of classrooms on either side while still maintaining a visual connection. The lighting of this space is hanging ceiling fixtures and an overhead light-well. For the classrooms, as can be seen on the following pages, 3x3 hanging ceiling panels are used with embedded light panels where needed.



ground floor rcp

ground floor rcp

First floor rcp



First floor rcp

Sections a and b

Sections a and b

Sections c and d

Sections c and d

# Detail Wall Section 1

# Detail wall section 1

## Detail wall section 2



## Detail wall section 2

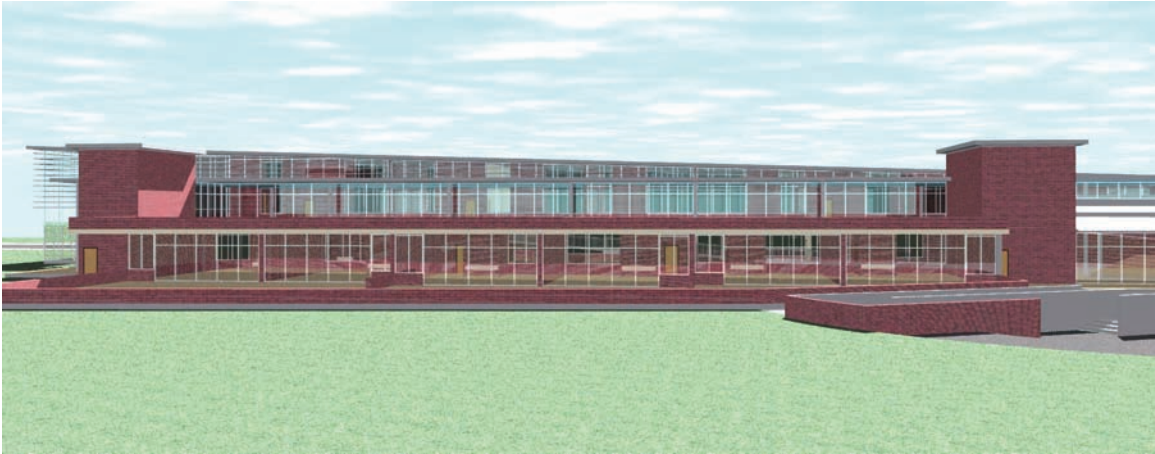
## Detail wall section 3

## Detail wall section 3

# Elevations

# Elevations

## INDEPENDENT PROJECT DRAWINGS (CON'T)



Above is the first floor kindergarten classrooms with the exterior play area for the first grade classrooms. The two towers on either side are for the vertical circulation.

Below is the Western edge of the buildings along the street. The low wall separated the exterior area for the preschool kids from the street along with trees which are not shown here. The sun-shades as seen in the previous drawings can be seen here as they block direct sun in the afternoons. The overhang on the ground floor provides shade for the preschool classrooms.



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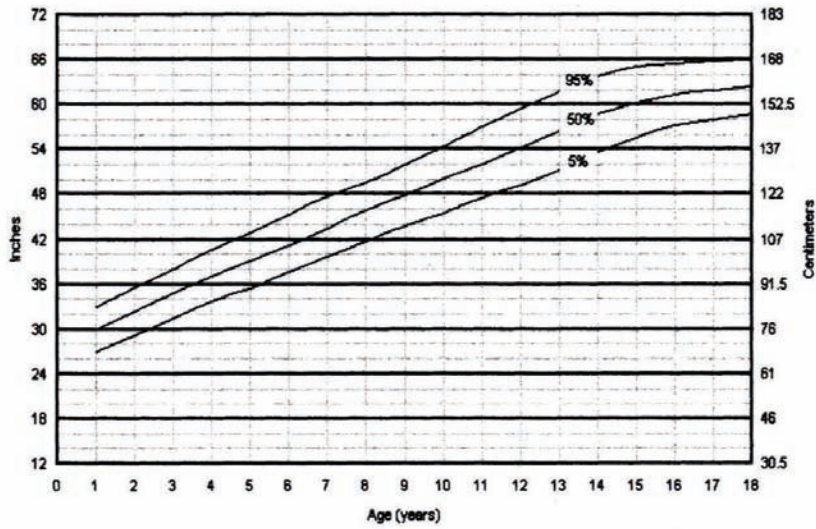
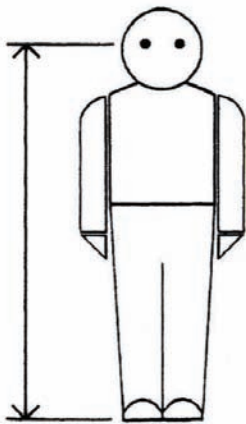
## ILLUSTRATION CREDITS

Title Page	w <a href="http://www.spdlc.com">www.spdlc.com</a>
Chapter 5	All images: Robin Nichols
Chapter 6	Pg 38– Overhead of Region: Google Earth Pg 39– Overhead of Town: Google Earth Pg 40– School Map: Google Earth Pg 41– Overhead of Neighborhood: Google Earth Pg 42– Graphs: <a href="http://www.weather.com">www.weather.com</a> Pg 43– Sun Charts: <a href="http://www.gaisma.com">www.gaisma.com</a> Pg 44– Sun chart: <a href="http://www.gaisma.com">www.gaisma.com</a> Pg 45– Chart/Graph: <a href="http://www.truewind.teamcamelot.com">www.truewind.teamcamelot.com</a> Pg 46– Overhead of Site: Google Earth All other images: Robin Nichols
Chapter 7	Pg 63– Zoning Map: Medfield Zoning Bylaws All other images: Robin Nichols
Chapter 8	Pg 69– Picture of Students: van Bergeijk, pg 10 Pg 70– Pictures of De Polygoon: van Bergeijk, pp 126-127 Pg 70– Site: Google Earth Pg 71– Diagram: van Bergeijk, pg 127 Pg 71– Plans: van Bergeijk, pg 126 Pg 71– Interior: Courtesy of Deborah Brenner Pg 72– Diagrams: van Bergeijk/ Robin Nichols Pg 73– Pictures of De Evenaar: van Bergeijk, pp 90-93 Pg 73– Site: Google Earth Pg 74– Section: van Bergeijk, pg 91 Pg 74– Interior Pictures: van Bergeijk, pp 90-93 Pg 75– Plans/Diagrams: van Bergeijk/ Robin Nichols Pg 76– Tatami mat drawing: Drexler, pg 67 Pg 77– Plan: Drexler, pg 265 Pg 78– Elevation and section: Drexler, pp15, 69 Pg 79– Pictures: Drexler, pg 274 Pg 80– Picture of Japan Loft: Cuito Pg 80– Picture of Barcelona Loft: Cuito Pg 81– Pictures of Carlin Springs: Noal Pg 81– Picture of Granger: Noal All other images: Robin Nichols
Appendix A	All images: Cain, pp 4-37, 64-65, 274-275

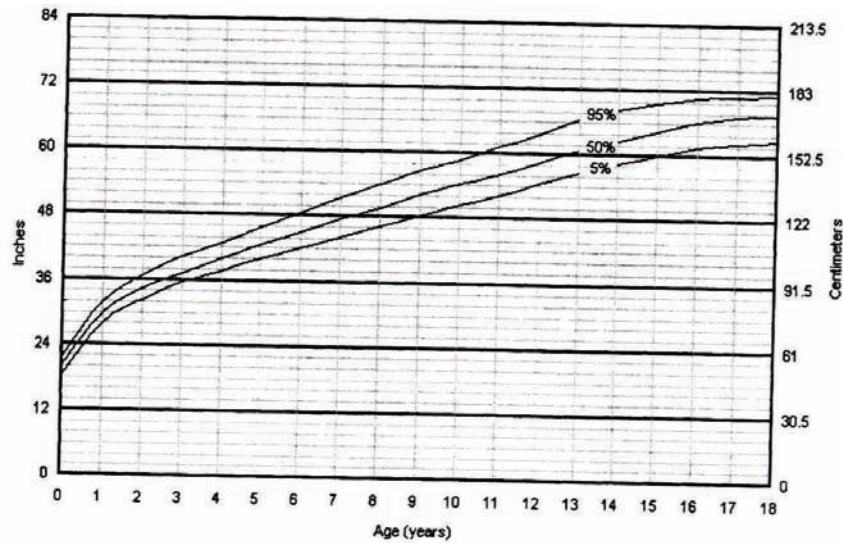
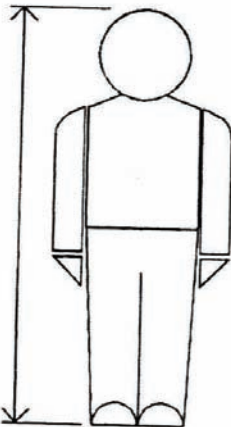
# APPENDIX A

THE FOLLOWING CHARTS AND GRAPHS ARE FROM LINDA CAIN RUTH'S BOOK DESIGN STANDARDS FOR CHILDREN'S ENVIRONMENTS. THEY ARE A GOOD REFERENCE FOR DESIGNING SPACES, BUILT-IN FURNISHINGS, BATHROOMS AND APPLIANCES.

## EYE LEVEL

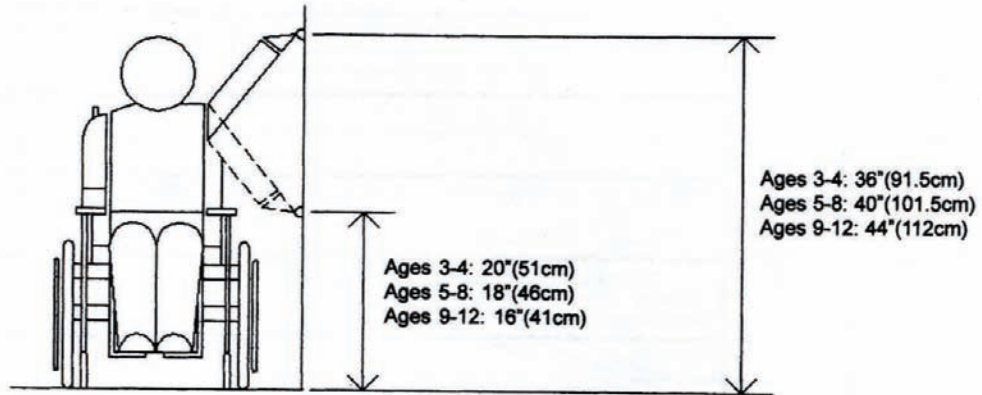


## HEIGHT

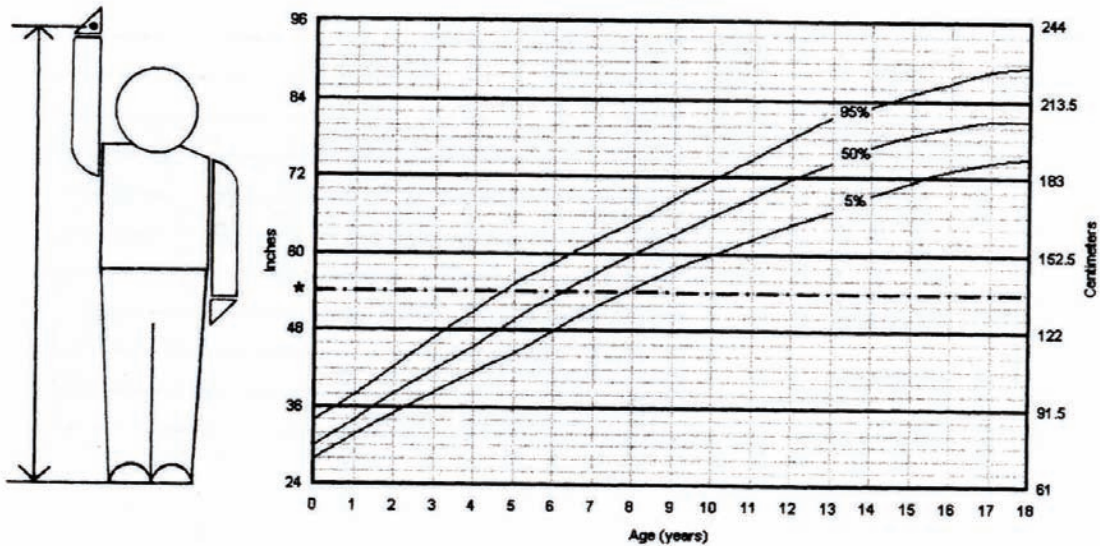


# APPENDIX A [CON'T]

## ACCESSIBLE HIGH AND LOW REACH— 16"-44"

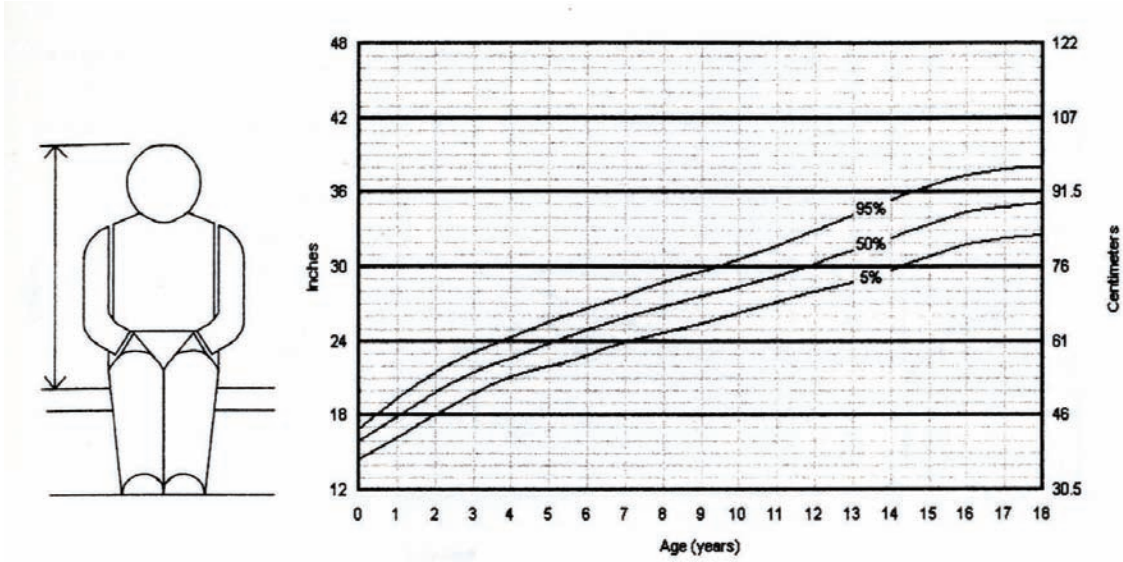


## MAXIMUM REACH—MAX HEIGHT FOR ADULT ADA MOUNTED ELEMENTS

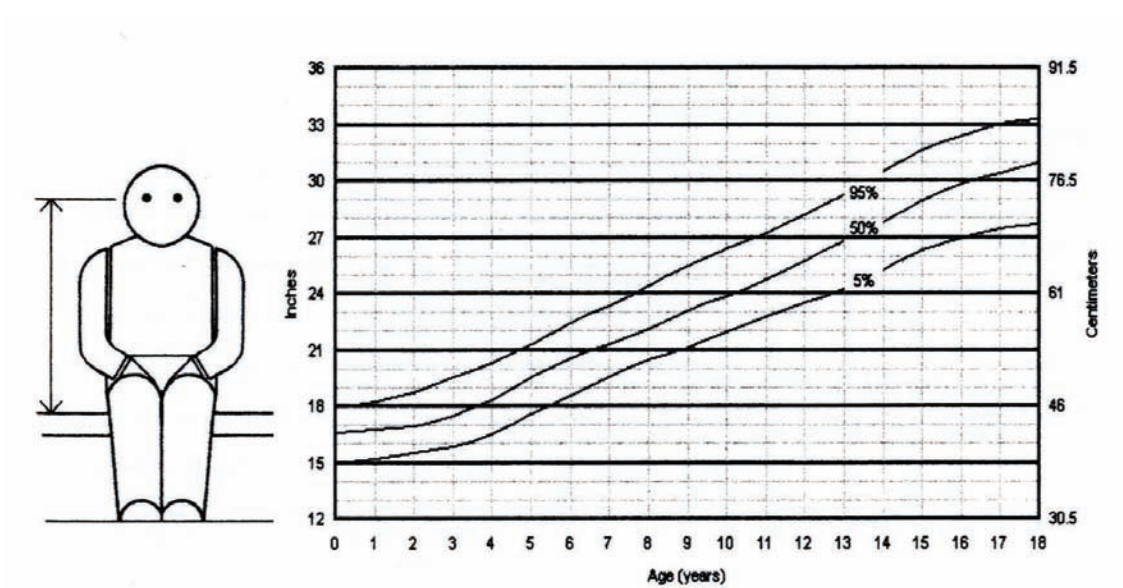


# APPENDIX A [CON'T]

## SEATED HEIGHT

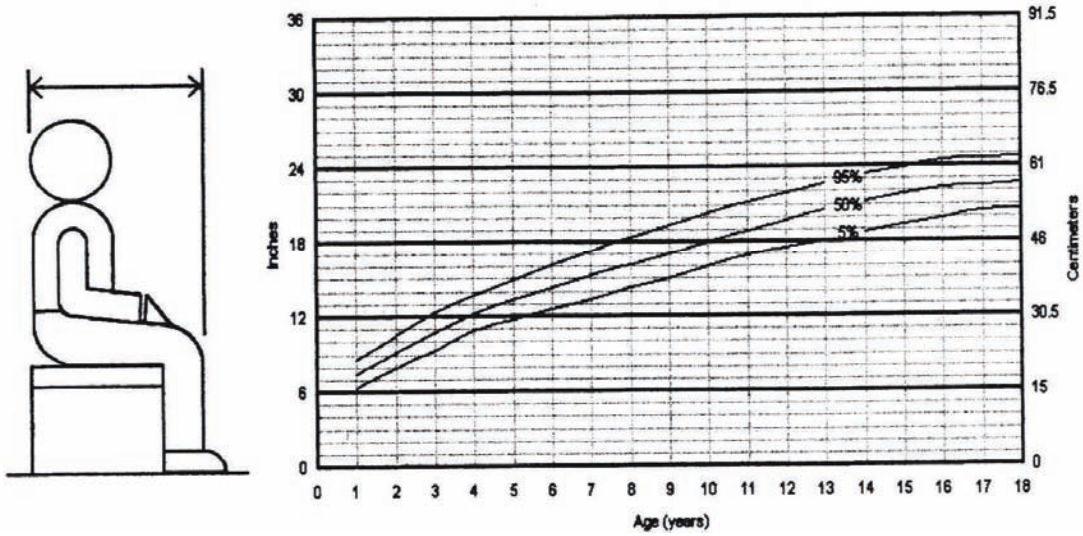


## SEATED EYE LEVEL

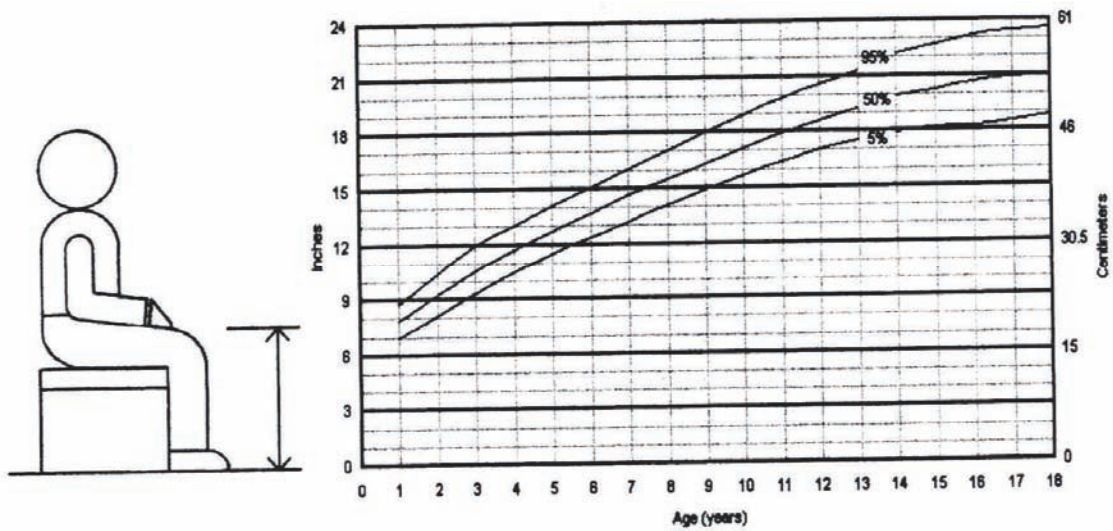


# APPENDIX A [CON'T]

## SITTING LENGTH FROM BACK TO KNEE

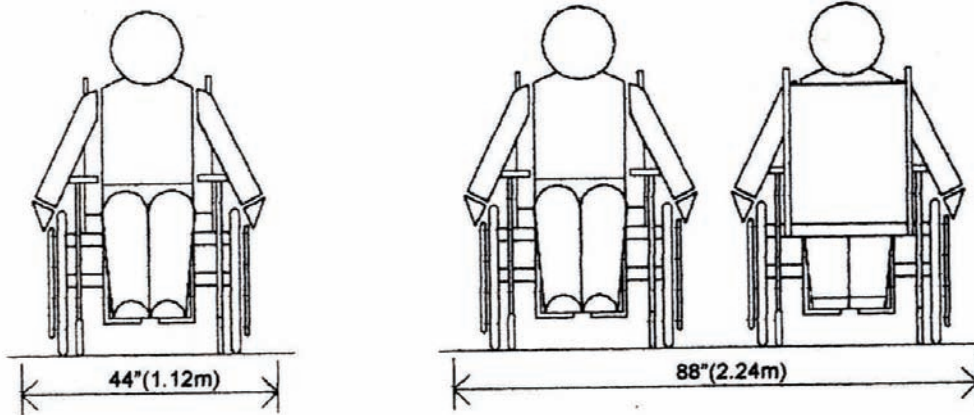


## SEATED HEIGHT FROM GROUND TO KNEE

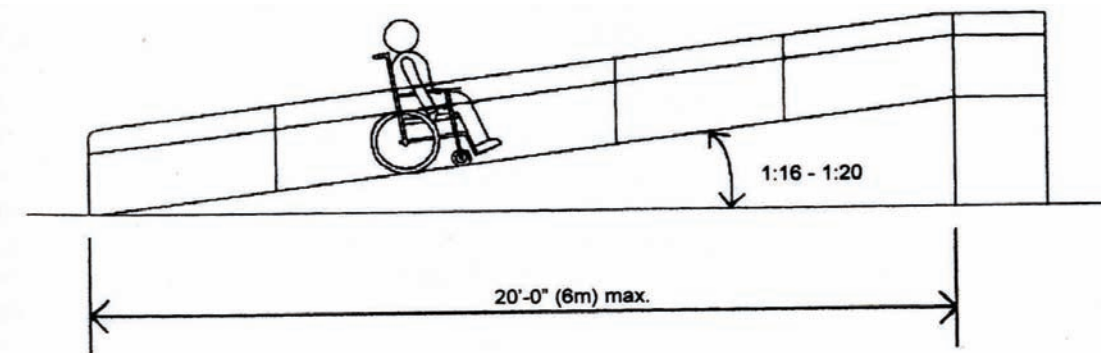


## APPENDIX A [CON'T]

### MINIMUM WIDTH OF ACCESSIBLE PATH—ONE WAY AND TWO WAY

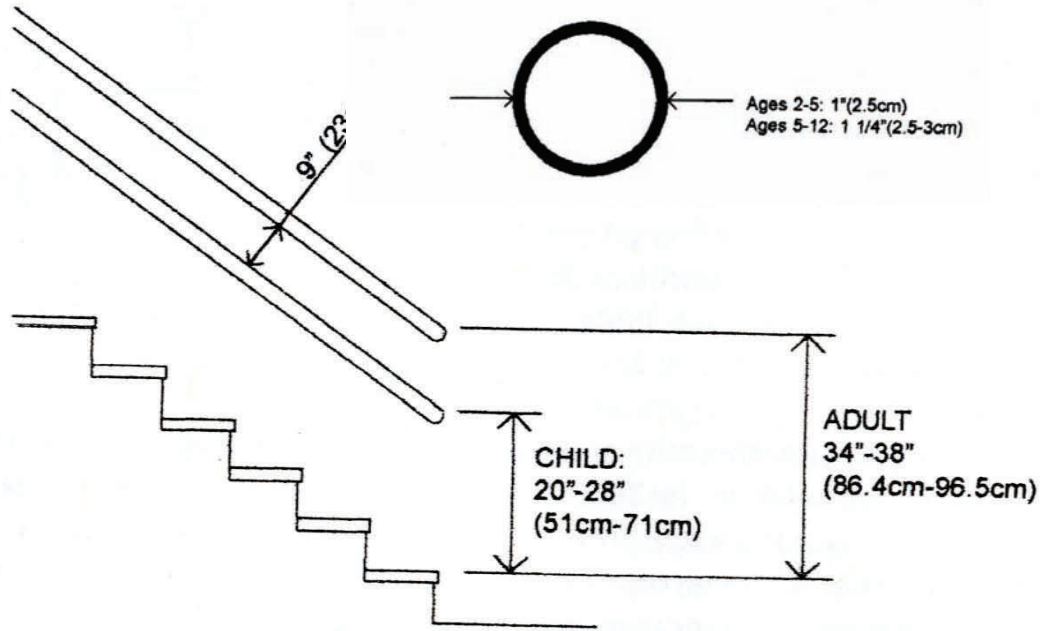


### ACCESSIBLE RAMP MAXIMUM LENGTH AND SLOPE

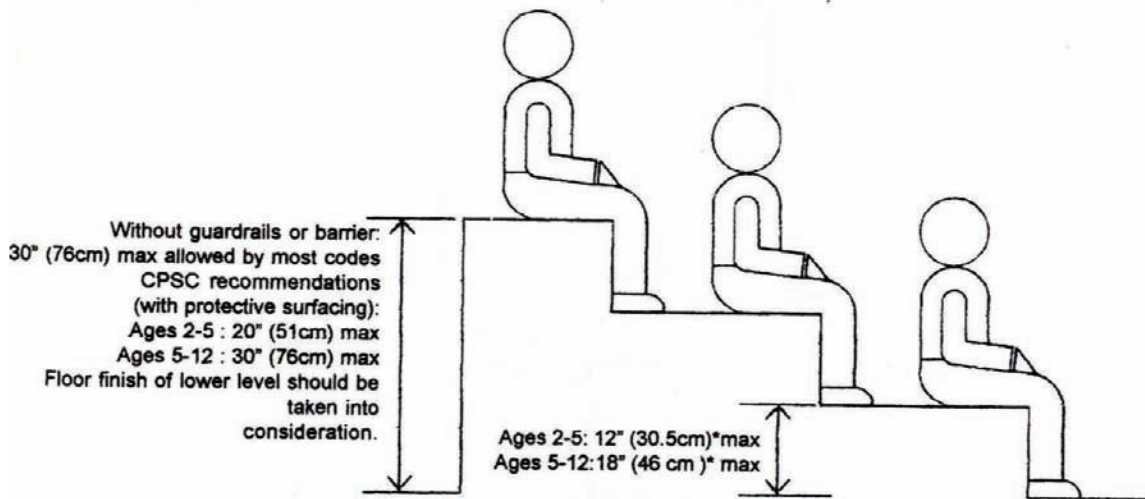


# APPENDIX A [CON'T]

## HANDRAIL HEIGHTS AND DIAMETERS



## PLATFORM HEIGHTS

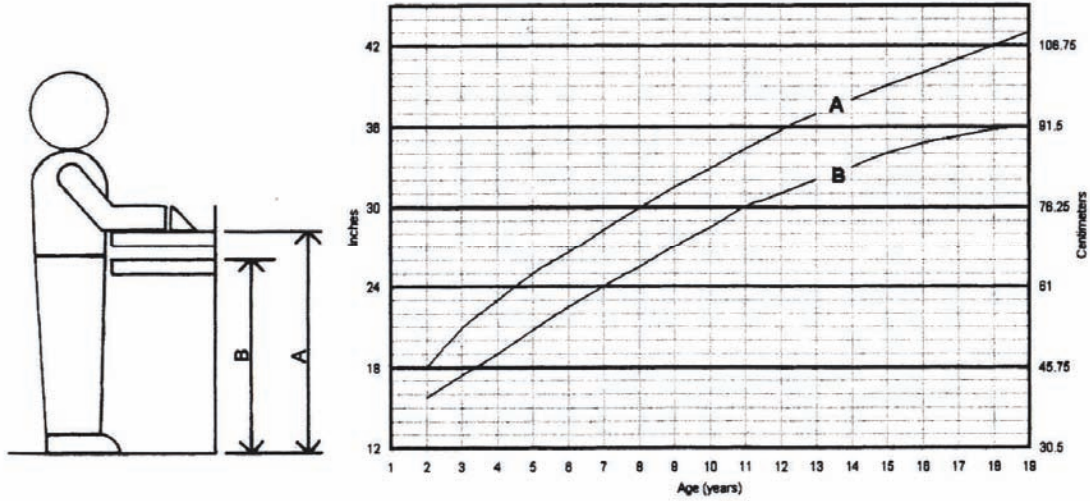


\* If left open, any spaces between stepped platforms should be less than 3/8 in (9 cm) or greater than 9 in (23 cm) to reduce the potential of entrapment.

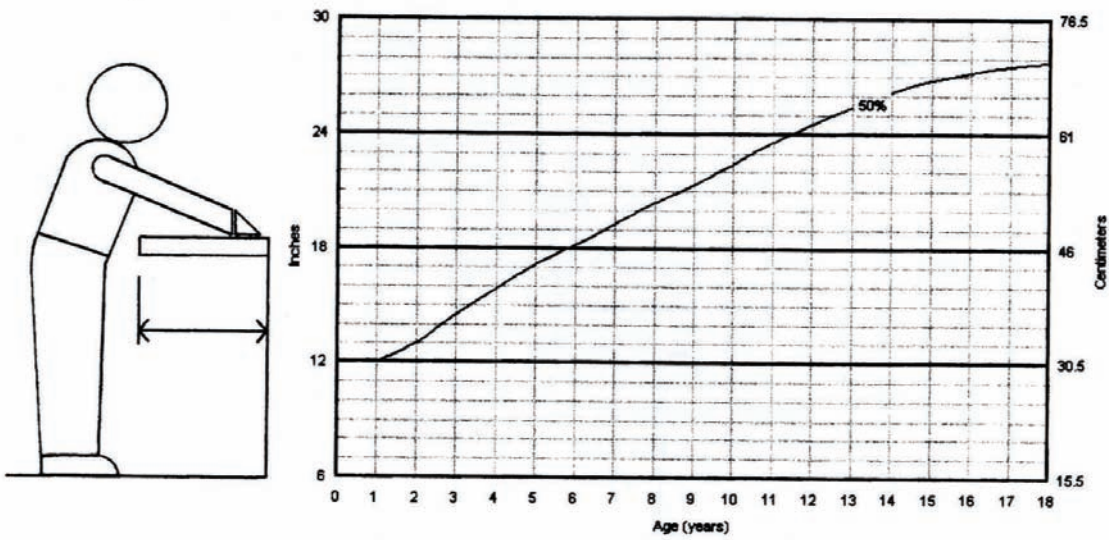


# APPENDIX A [CON'T]

## STANDING WORK SURFACE HEIGHT

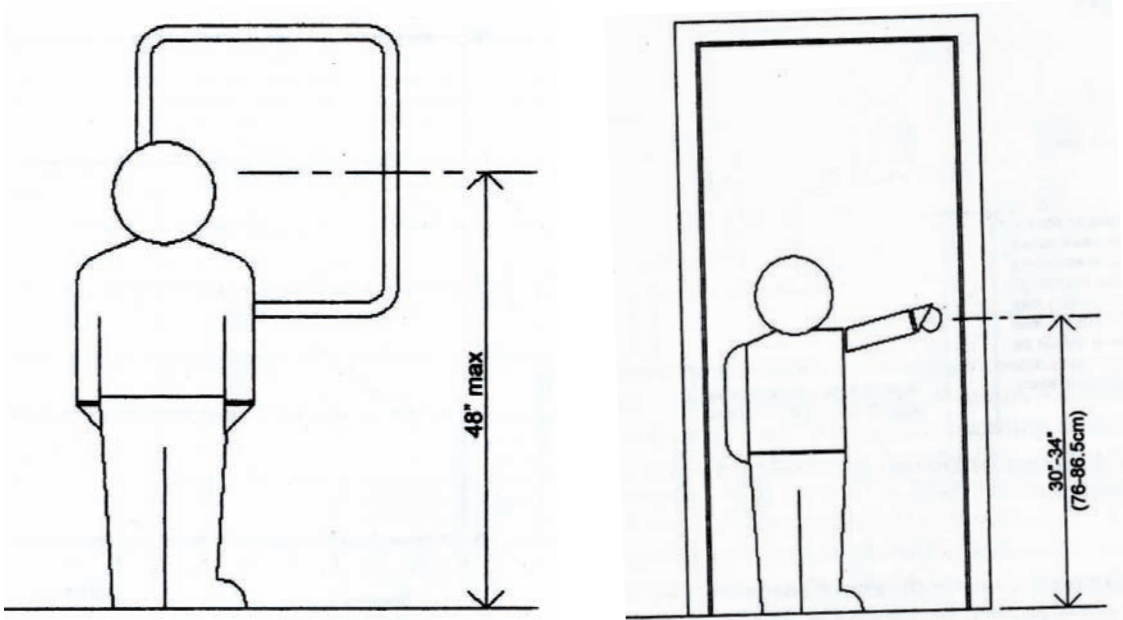


## STANDING WORK SURFACE DEPTH

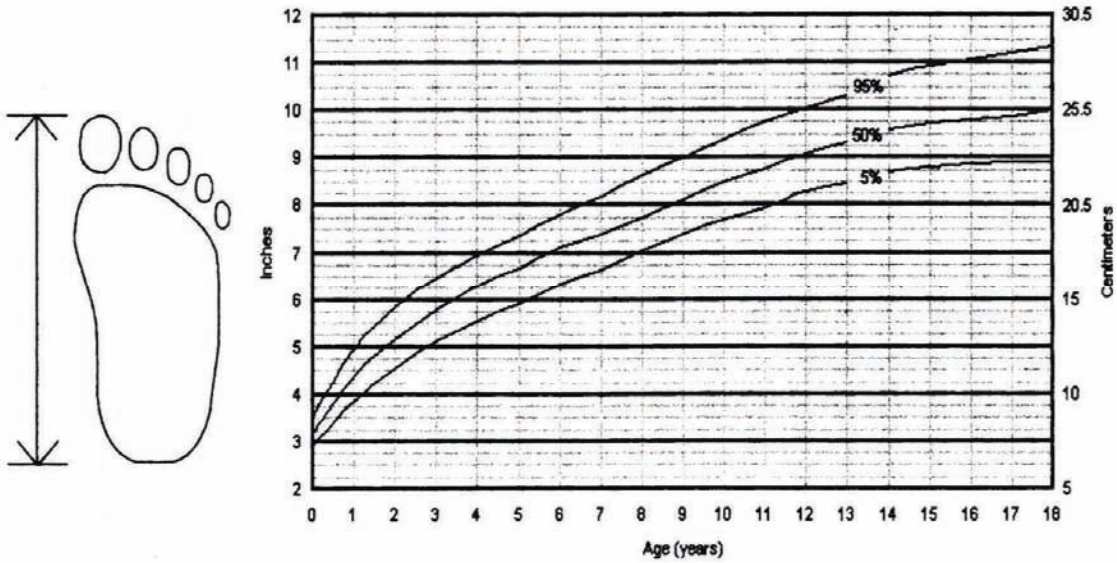


# APPENDIX A [CON'T]

## DOOR HARDWARE HEIGHT and MAXIMUM SIGNAGE HEIGHT

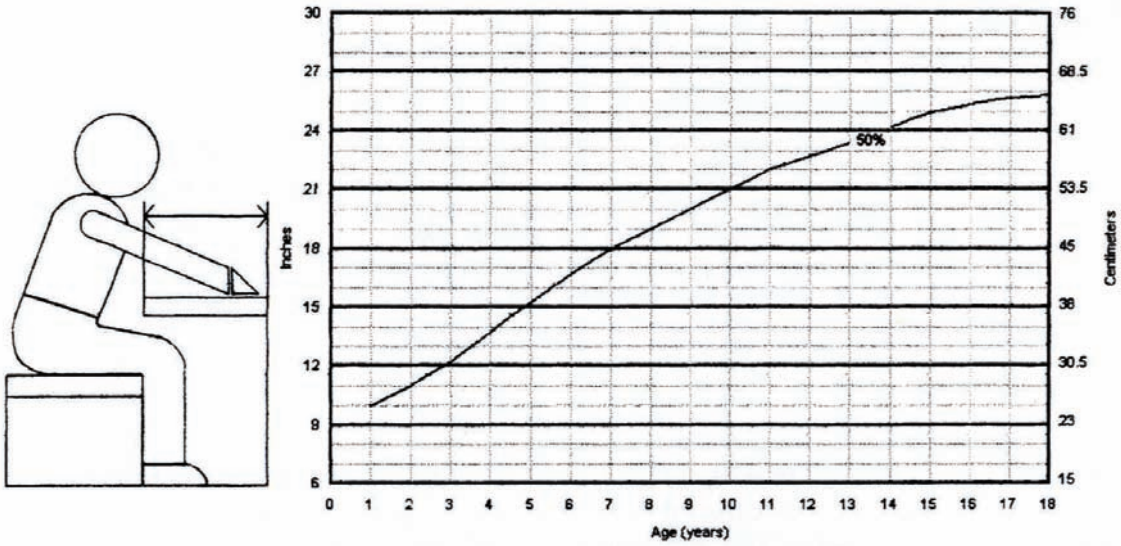


## FOOT LENGTH

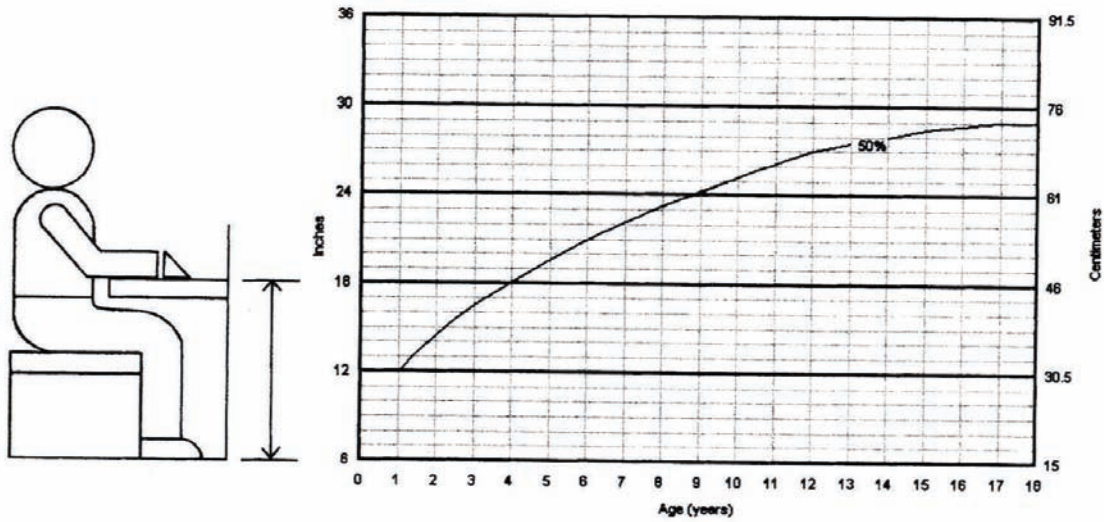


# APPENDIX A [CON'T]

## SITTING WORKTOP DEPTH

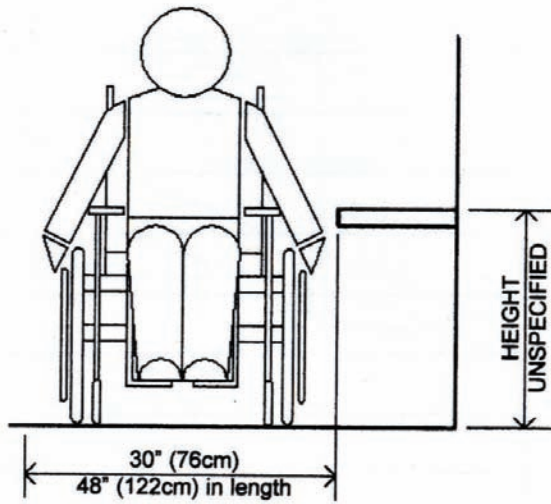


## SITTING WORKTOP HEIGHT

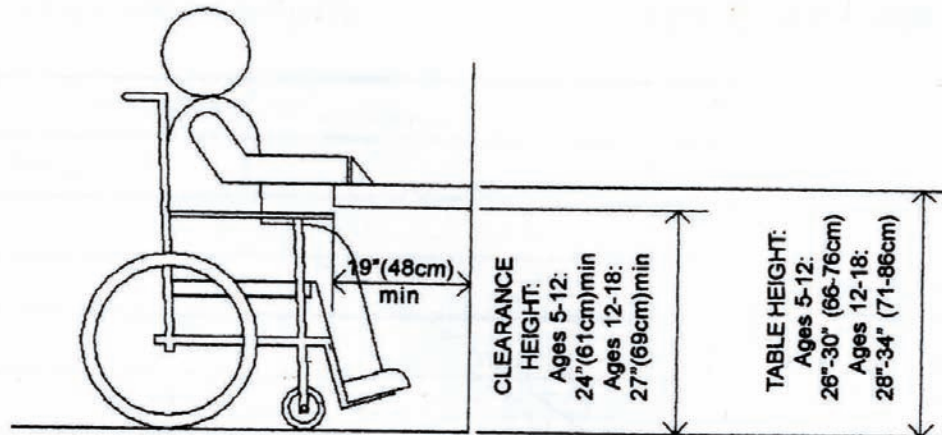


# APPENDIX A [CON'T]

## ACCESSIBLE WORK SURFACE CLEARANCE



AGES 0-5

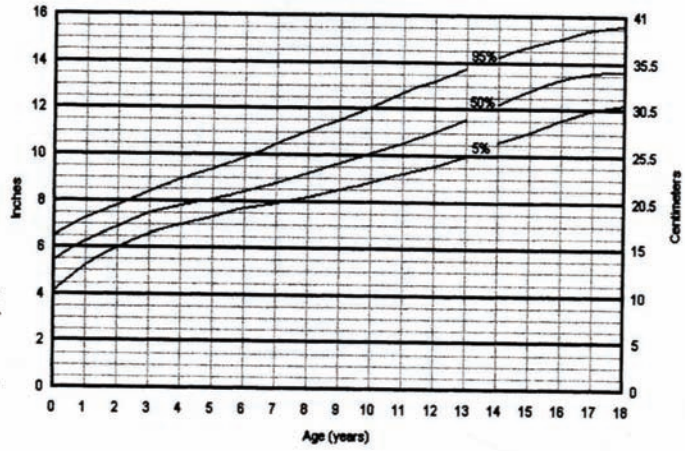


AGES 5-12 and 12-18

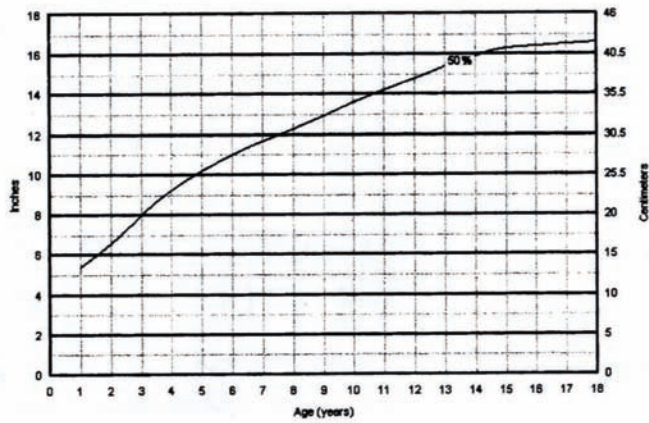
# APPENDIX A [CON'T]

## SEAT DIMENSIONS

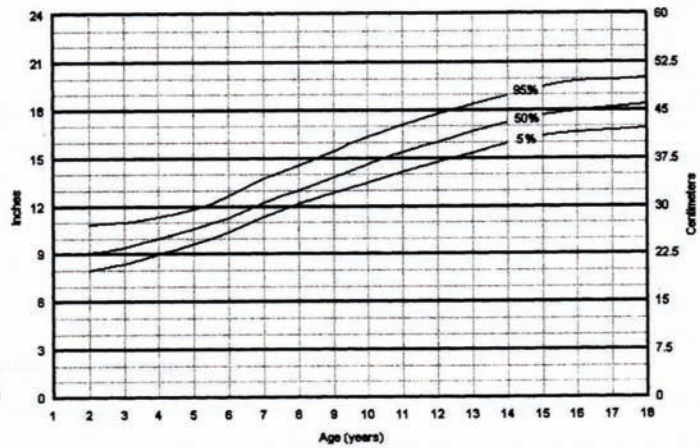
WIDTH



HEIGHT

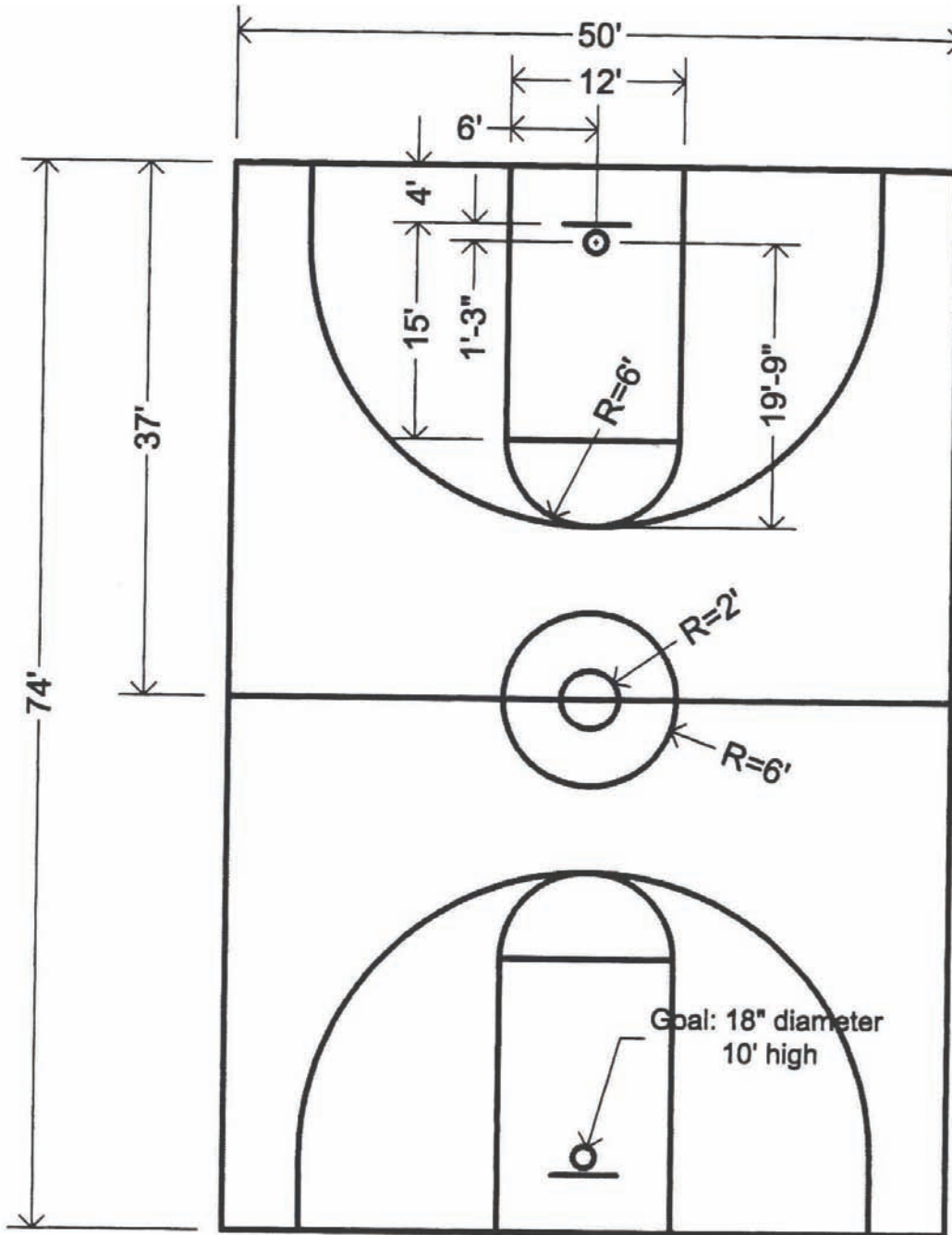


DEPTH



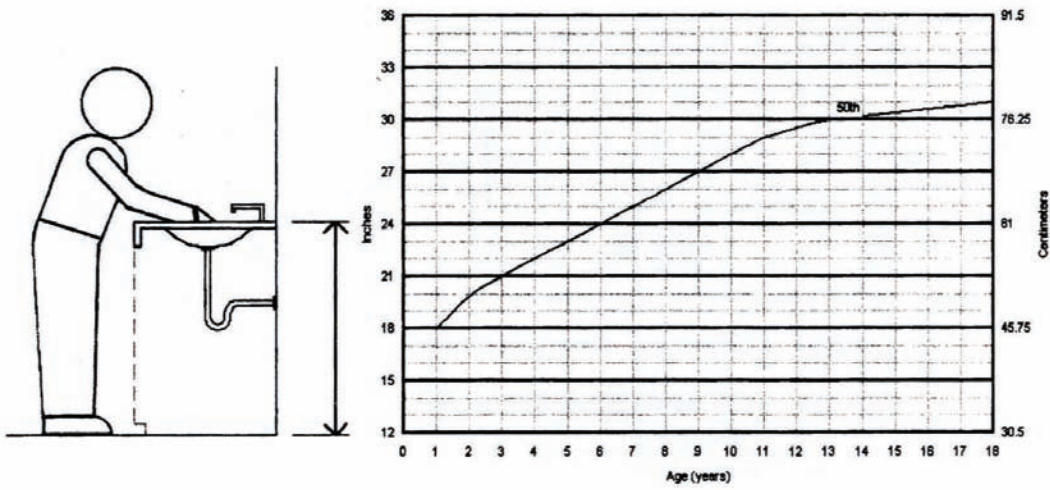
# APPENDIX A [CON'T]

BASKETBALL COURTS— LOWER BASKETS TO 8 FEET MAXIMUM FOR YOUNGER CHILDREN

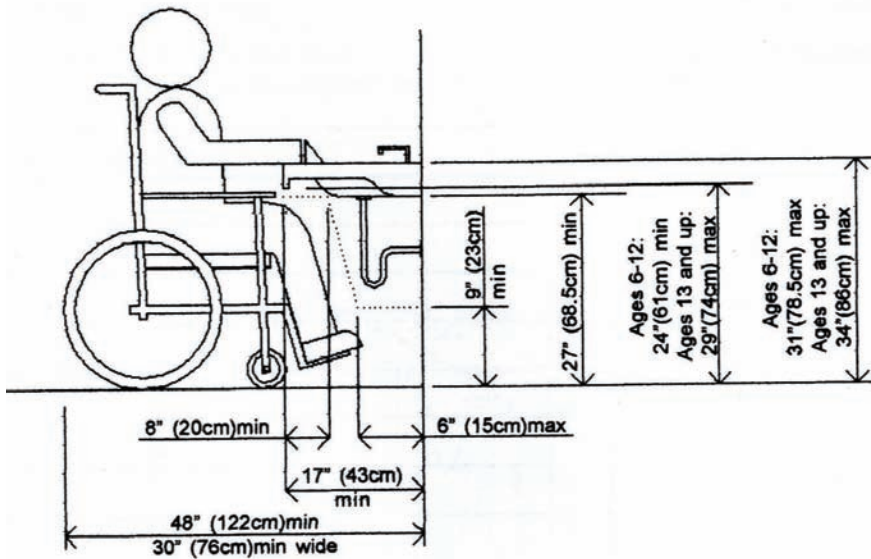


# APPENDIX A [CON'T]

## SINK HEIGHT



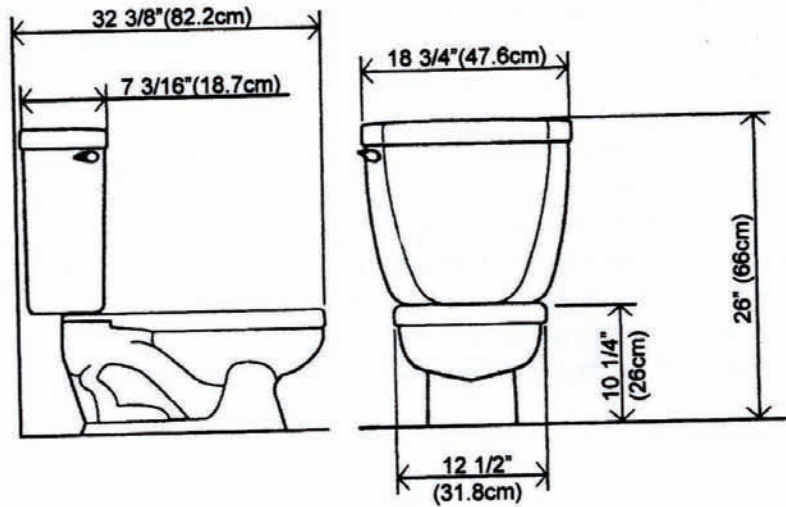
## ACCESSIBLE SINK HEIGHT, DEPTH, AND DEPTH



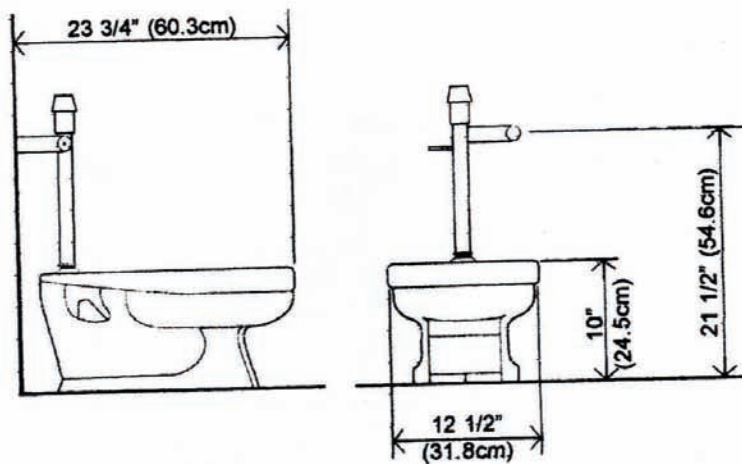
AGES 6-12 AND 13-18

## APPENDIX A [CON'T]

### TOILET HEIGHT, WIDTH, AND DEPTH



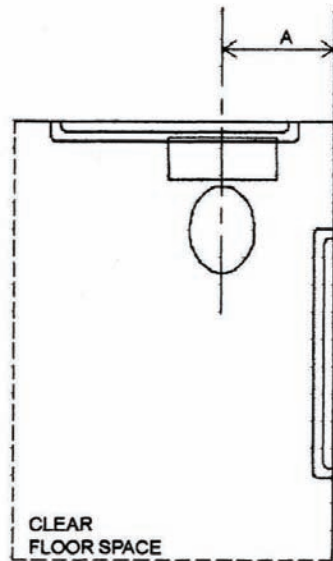
TANK MODEL



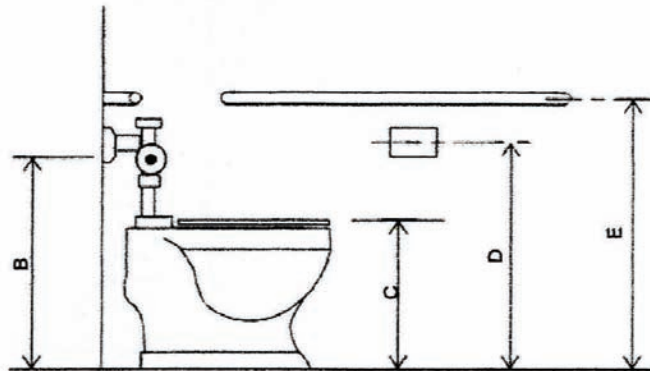
FLUSH VALVE MODEL



## APPENDIX A [CON'T]



PLAN VIEW



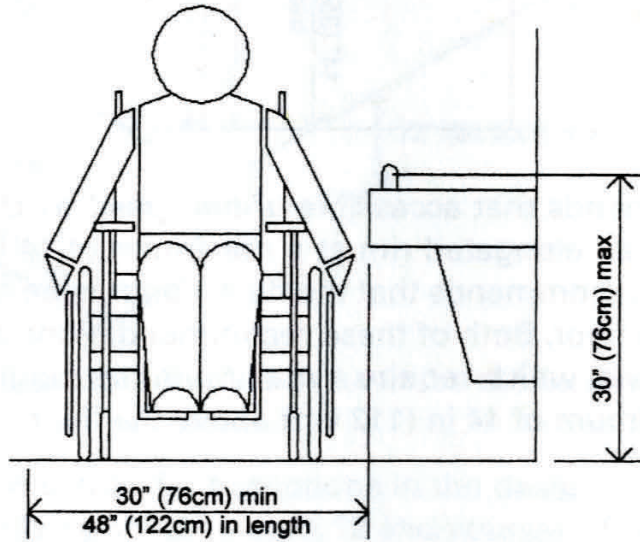
SIDE VIEW

	<b>Ages 3-4</b>	<b>Ages 5-8</b>	<b>Ages 9-12</b>	<b>Ages 12+</b>
<b>A</b>	12 in (30.5 cm)	12-15 in (30.5-38 cm)	15-18 in (38-45.5 cm)	18 in (45.5 cm)
<b>B</b>	36 in (91.5 cm)	36 in (91.5 cm)	36 in (91.5 cm)	44 in (112 cm)
<b>C</b>	11-12 in (28-30.5 cm)	12-15 in (30.5-38 cm)	15-17 in (38-43 cm)	17-19 in (43-48 cm)
<b>D</b>	14 in (35.5 cm)	14-17 in (35.5-43 cm)	17-19 in (43-48.5 cm)	19 in (48.5 cm)
<b>E</b>	18-20 in (45.5-51 cm)	20-25 in (51-63.5 cm)	25-27 in (63.5-68.5 cm)	33-36 in (84-91.5 cm)

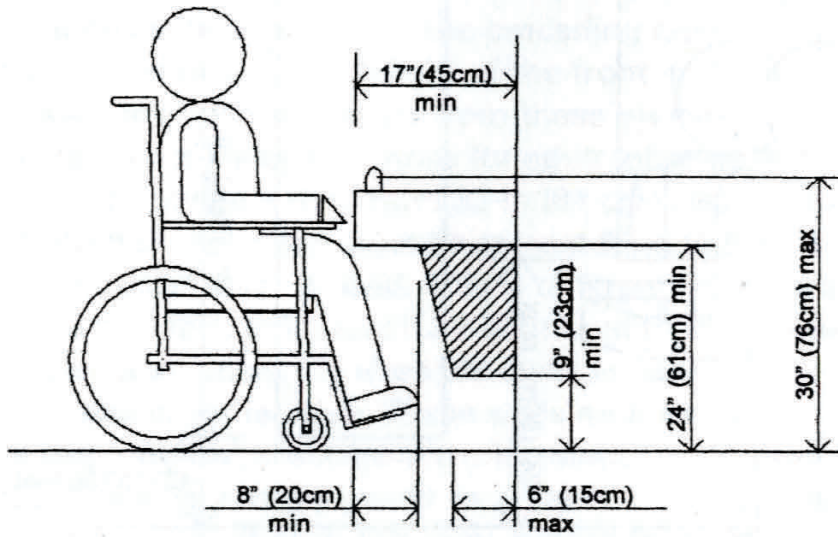
Adapted from: Architectural and Transportation Barriers Compliance Board, *Americans with Disabilities Act (ADA) Guidelines for Buildings and Facilities; Building Elements Designed for Children's Use*, 1998.

# APPENDIX A [CON'T]

## ACCESSIBLE WATER FOUNTAINS

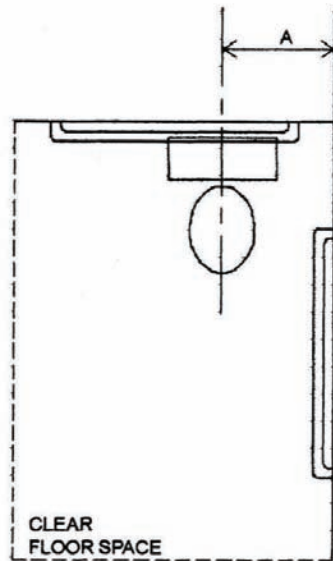


PARALLEL APPROACH

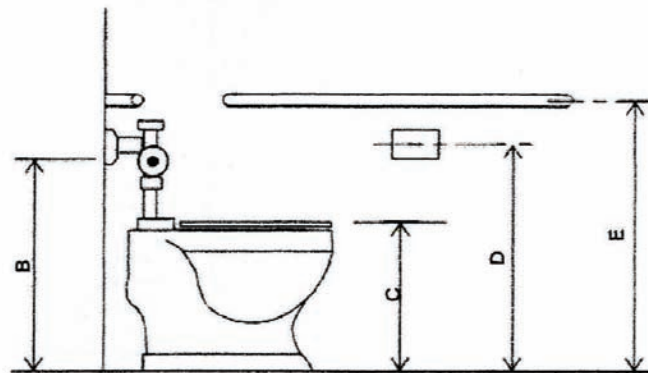


FORWARD APPROACH

## APPENDIX A [CON'T]



PLAN VIEW



SIDE VIEW

	<b>Ages 3-4</b>	<b>Ages 5-8</b>	<b>Ages 9-12</b>	<b>Ages 12+</b>
<b>A</b>	12 in (30.5 cm)	12-15 in (30.5-38 cm)	15-18 in (38-45.5 cm)	18 in (45.5 cm)
<b>B</b>	36 in (91.5 cm)	36 in (91.5 cm)	36 in (91.5 cm)	44 in (112 cm)
<b>C</b>	11-12 in (28-30.5 cm)	12-15 in (30.5-38 cm)	15-17 in (38-43 cm)	17-19 in (43-48 cm)
<b>D</b>	14 in (35.5 cm)	14-17 in (35.5-43 cm)	17-19 in (43-48.5 cm)	19 in (48.5 cm)
<b>E</b>	18-20 in (45.5-51 cm)	20-25 in (51-63.5 cm)	25-27 in (63.5-68.5 cm)	33-36 in (84-91.5 cm)

Adapted from: Architectural and Transportation Barriers Compliance Board, *Americans with Disabilities Act (ADA) Guidelines for Buildings and Facilities; Building Elements Designed for Children's Use*, 1998.

## APPENDIX B

### ACTUAL SQUARE FOOTAGES

Nurses Office	1200 SF
Resource Center	1200 SF
Library	2500 SF
Public Bathrooms	300 SF
Administration	2000 SF
Dining Area/Central Meeting Space	4000 SF
Kitchen and Service	3800 SF
Kindergarten Classrooms North	6500 SF
Kindergarten Classrooms South	9000 SF
Preschool Classrooms	9000 SF
First Grade Classrooms	18000 SF
Other Public Spaces	5000 SF
Circulation Space	<u>20,000 SF</u>
Total SF:	<b>82,500 Square Feet</b>

\* Basement not included.

## ILLUSTRATION CREDITS

Title Page	w www.spdlc.com
Chapter 5	All images: Robin Nichols
Chapter 6	Pg 38– Overhead of Region: Google Earth Pg 39– Overhead of Town: Google Earth Pg 40– School Map: Google Earth Pg 41– Overhead of Neighborhood: Google Earth Pg 42– Graphs: www.weather.com Pg 43– Sun Charts: www.gaisma.com Pg 44– Sun chart: www.gaisma.com Pg 45– Chart/Graph: www.truewind.teamcamelot.com Pg 46– Overhead of Site: Google Earth All other images: Robin Nichols
Chapter 7	Pg 63– Zoning Map: Medfield Zoning Bylaws All other images: Robin Nichols
Chapter 8	Pg 69– Picture of Students: van Bergeijk, pg 10 Pg 70– Pictures of De Polygoon: van Bergeijk, pp 126-127 Pg 70– Site: Google Earth Pg 71– Diagram: van Bergeijk, pg 127 Pg 71– Plans: van Bergeijk, pg 126 Pg 71– Interior: Courtesy of Deborah Brenner Pg 72– Diagrams: van Bergeijk/ Robin Nichols Pg 73– Pictures of De Evenaar: van Bergeijk, pp 90-93 Pg 73– Site: Google Earth Pg 74– Section: van Bergeijk, pg 91 Pg 74– Interior Pictures: van Bergeijk, pp 90-93 Pg 75– Plans/Diagrams: van Bergeijk/ Robin Nichols Pg 76– Tatami mat drawing: Drexler, pg 67 Pg 77– Plan: Drexler, pg 265 Pg 78– Elevation and section: Drexler, pp15, 69 Pg 79– Pictures: Drexler, pg 274 Pg 80– Picture of Japan Loft: Cuito Pg 80– Picture of Barcelona Loft: Cuito Pg 81– Pictures of Carlin Springs: Noal Pg 81– Picture of Granger: Noal All other images: Robin Nichols
Appendix A	All images: Cain, pp 4-37, 64-65, 274-275

## ACKNOWLEDGEMENTS



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