

“WAND GARDEN”
FOR
NORTH DAVIS ELEMENTARY
SCHOOL

LANDSCAPE ARCHITECTURE PROGRAM
UNIVERSITY OF CALIFORNIA, DAVIS
SENIOR PROJECT



PREPARED BY
DUY TRAN VAN

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“WAND GARDEN”
FOR
NORTH DAVIS ELEMENTARY SCHOOL

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Landscape Architecture Department
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Accepted and Approved By:

Mark Francis
Professor, Landscape Architecture, Senior Project Advisor

Kerry Daane Loux, ASLA
Director of Davis Operations, Landscape Architect

Ramon C. Cusi, Ed.D
Principal, North Davis Elementary School

Carolyn Teragawa
Garden Coordinator, North Davis Elementary School

Duy Tran Van
June 12, 2009

Abstract

This design project is to design and develop a garden for students, teachers, and parents at North Davis Elementary School in Davis, California. The garden will also be a place that will welcome all members of the North Davis Elementary community, where their minds, and their bodies are nurtured. The design will be a demonstration of how the landscape can nurture growing bodies by providing fresh, homegrown produce, and reducing an existing resource-intensive lawn area. This project links as much of the campus and surrounding community as possible, to create a positive space on the grounds of North Davis Elementary School.

The first half of this project focused on the background data for North Davis Elementary School and case studies, establishing strategies and elements that have been successful and unsuccessful in similar projects were established. The second half of this project included the creation of a final site design such as design process, plants selection. . . This project will provide an opportunity to embrace and enhance the sense of community through a continual and joint gardening effort.

Dedications

I dedicate this project to my family and friends for all their love and support.

To my grandparents: Even though you have passed away, your beautiful love and support is always in my mind.

To my parents: Thank you for your love and inspiration.

Acknowledgements

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Chapter 1 | Introduction

Design Intent:

What is a school garden? “A school garden is an innovative teaching tool and strategy that lets educators incorporate hands-on activities in a diversity of interdisciplinary, standards-based lessons.” (Source: www.csgn.org)

The garden engages students by providing a dynamic environment in which to observe, discover, experiment, nurture and learn. It is also a living laboratory where lessons are drawn from real-life experiences. In addition, the garden allows students to become active participants in the learning process. Through the garden, students gain an understanding of ecosystems, an appreciation for food origins and nutrition, and knowledge of plant and animal life cycles. At the same time, they learn practical horticultural skills that last a lifetime.

School gardens can come in all shapes and sizes. Some schools have enough space to give each student his/her own plot such as Fairfield Elementary School. Gardens may have specific themes or be used to teach specific subjects. They may be created and maintained by one grade or used by multiple grade levels. However, where do the school gardens come from?

The school gardens movement originated in Europe and arrived in the United States in the 1890s. The following timeline provides a brief history of school gardens.

“Gardening isn’t just a hobby, it’s a magnificent journey of discovery.”
(Joseph F. Williamson Jr. 1925-2000)

1525 - Botanical garden planted at an Italian University for educational purposes.

16th Century - Quote by Comenius: "A school garden should be connected with every school where children can have opportunities for leisurely gazing upon.

1869 - Austria mandates that all schools must have school gardens (followed by similar measures in Germany, Sweden, Belgium, France, Russia and England).

1890 - First official US school garden at George Putnam School of Roxbury, Massachusetts for wildflowers and vegetables.



Fig.1.1 2 First Young School Independence, MO

1897 - Boy's Garden established by the National Cash Register Company to instill good work ethic.

Early 20th Century - Large US cities incorporated school gardens including Philadelphia, Cleveland and Washington D.C.

World War I and World War II - Gardens popular as a sign of patriotism.

20th Century - School gardens continue to grow! (source: www.hort.vt.edu)

Project Location:

The site is about 5,400 square feet, located on the south edge of campus, bordered on the west by the bike parking area and on the east by the sidewalk in front of the school administration offices (Fig. 1.2)

Currently, the site is covered by a lawn area with some ground cover and a few mature trees. The lawn area is used as a buffer separating the parking from the lunch area and the school office. It is also a place for the school's waste

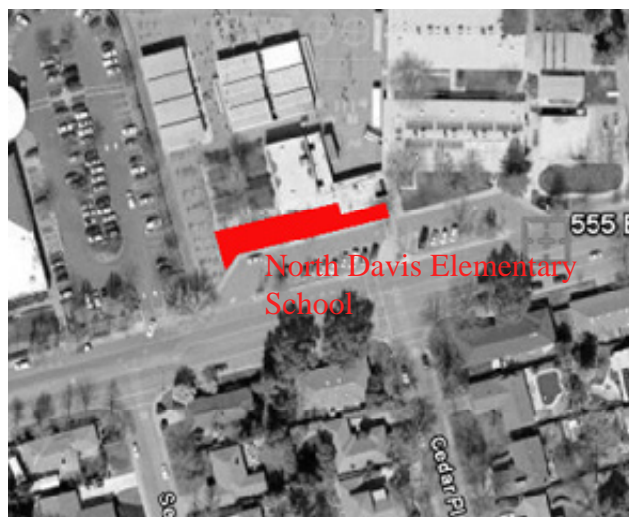


Fig. 1.2 Campus Map locating Garden Site

and recycling on pick-up days.

School Information:

North Davis Elementary School was established in 1958 and now boasts an enrollment of 565 smiling children (Fig. 1.4). Their mascot is the Dolphin.

The Academic Performance Index (API) rose from 903 to 908 in 2008, making North Davis Elementary School one of three elementary schools in Davis to score over 900 on this statewide measure. (Source: Wikipedia, 2009)

In addition to a strong academic program, students enjoy rich visual and performing arts programs and a comprehensive P.E. Program. Intermediate students also continue to participate in GEN YES, via a grant that brought laptop computers to their classrooms and the opportunity to learn in-depth technology skills that result in student-created multi-media presentations.

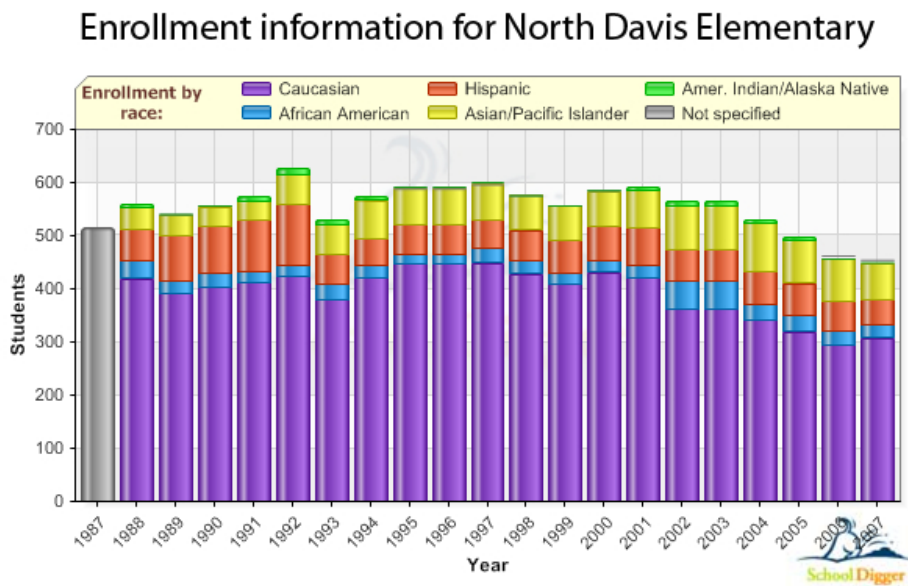


Fig. 1.3 Enrollment information 1 (Source: www.Schooldigger.com)

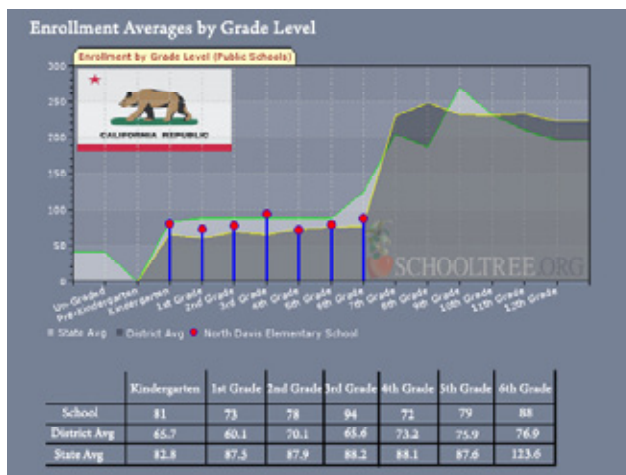


Fig. 1.4 Enrollment information 2 (Source: www.Schooltree.org)

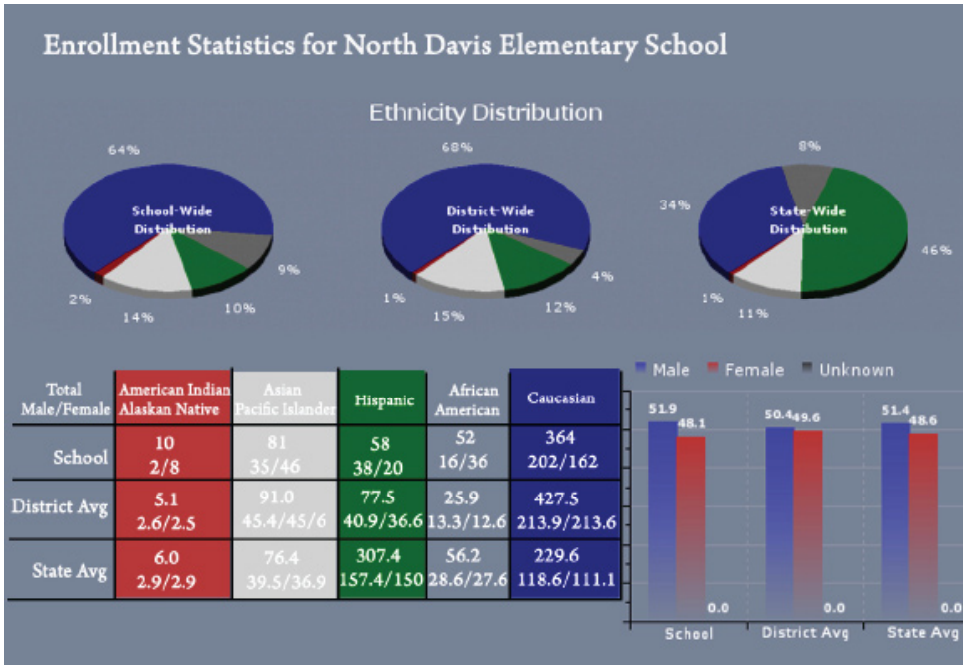


Fig. 1.5 Enrollment statistics (Source: www.Schooltree.org)

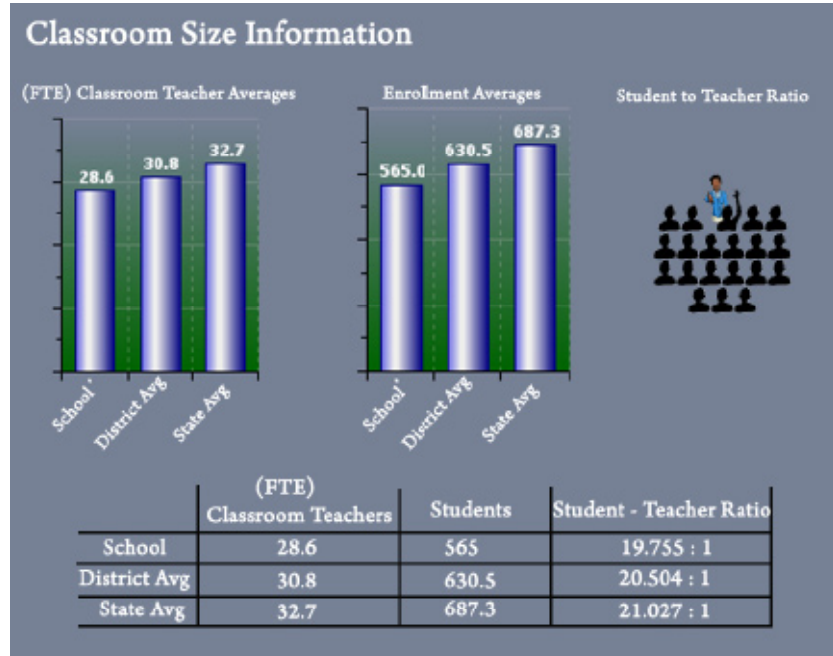


Fig.1.6 Classroom size information (Source: www.Schooltree.org)

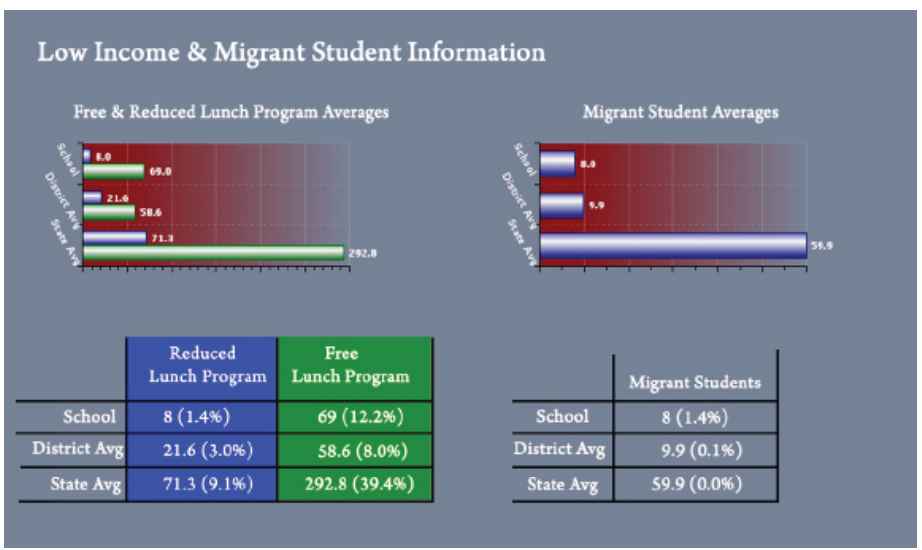


Fig. 1.7 Low income & migrant student information (Source www.Schooltree.org)

Site Analysis:

As we know, every site has a unique set of features and conditions that create the identity and character of the place. "Natural factors such as wind, sun, and topography and cultural factors such as structure on adjacent lands exist in complex and dynamic interrelationships with one another." (Johnson & Duffek, 78)

The WAND GARDEN is located on an interesting area (Fig. 1.8), between the staff parking lots and the school's multi-purpose building. The site is flat and divided into two by a walkway and a loading area for the truck.

The site is used as a buffer separating the parking from the lunch area and the school office. It is also a place for the school's waste and recycling on pick up days.

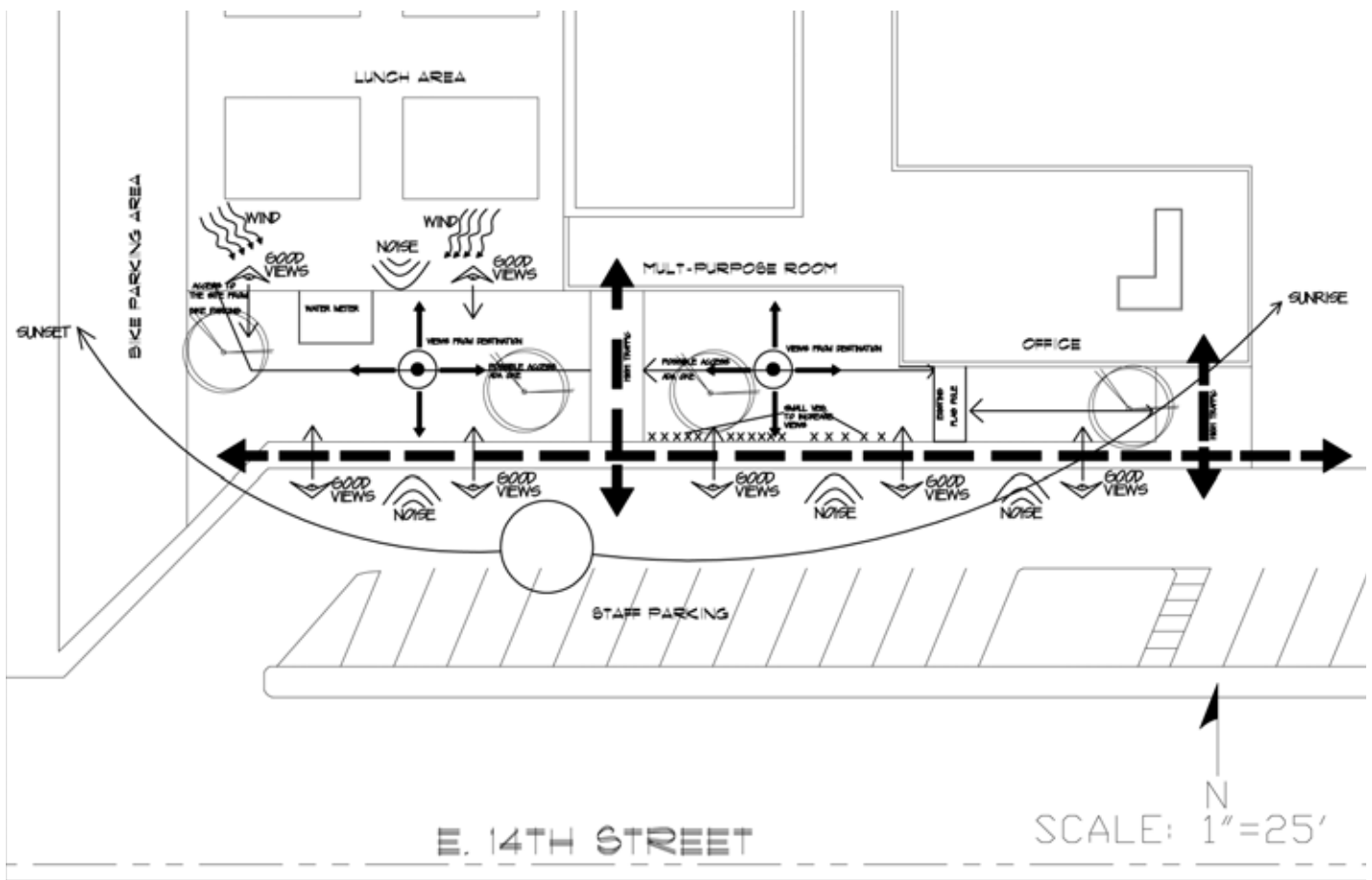


Fig. 1.8 WAND GARDEN site analysis diagram

Opportunities

- Great views from all directions
- Sunlight for almost the whole day
- Great site for outdoor classrooms

Great soil compact creates opportunities for production garden

Good access

Contraints

Too much noise

Dangerous, easy for students to run away

Services issues (waste and recycling)

Case Study 1 | Birch Lane Elementary School Gardens, Davis, CA

Gardens Background:

Located at 1600 Birch Lane in Davis, California, the school is situated in a great environment. It has many small gardens which have been created by teachers, the school garden coordinator, students and community volunteers. The elementary school garden become a very successful example of school gardening.

I visited the school on a beautiful day in April with the North Davis Elementary School's Garden Coordinator, Carolyn Teragawa, and we met with Debra Ariola. She is employed by Birch Lane as a full-time garden coordinator.



Fig.2.1 Concrete pathway in "The Castle Courtyard"



Fig. 2.2 Concrete planter with mosaic design tile in "The Castle Courtyard"



Fig. 2.3 Concrete block wall with artwork in "The Castle Courtyard"

First, she took us to "The Castle Courtyard," which she and her students designed in 2002-2003. It is a great design for a small area with a concrete pathway and

paving (Fig. 2.1). The circular concrete planter with a mosaic design (Fig. 2.2), and seating areas with wooden benches were created as the multi-use areas for students that function as an outdoor classroom. There is also a concrete block wall with artwork on the surface (Fig. 2.3). The purpose of the block wall is to slow the traffic between the school's basketball court and the classrooms and the courtyard was built by teachers, students, and their parents.

Second, we moved along the hallway to "The Seating Rock Garden" and "The North Garden." The Seating Rock Garden is attractive because of the way it was designed. Emerging from a flat expanse of mulched ground, large big rocks are structurally placed and used as seating areas. On the corners are some healthy plantings and shrubs (Fig. 2.4).



Fig. 2.4 The Seating Rock Garden

The North Garden's raised beds are unique (Fig. 2.5). They are about 6-inches tall and triangle shaped. The garden grows vegetables, herbs and flowers, and also has a set of small active compost sites.



Fig. 2.5 The North Garden's raised beds

Third, we came to "The South Garden", which is in a small area but is a well-organized and productive garden (Fig. 2.6). Seven garden classes garden in this area and each class has its own garden name. In every spot, students grow different kinds of produce such as



Fig. 2.6 The South Garden's raised beds

strawberries, broccoli, onions, cabbage... etc. This area, like North Garden, has a set of compost sites, which provide soil for the garden. These plants are also available for

sale at the school garden sale. "We made \$900 on the last three days; most people were the parents; they came to support the school" (Ariola, Personal Communication, April 2, 2009). Both of these features-- The North and the South Garden-- support the health of the garden and serve as interesting sources for science lessons.

Project Significance & Impact:

The Birch Lane Elementary School Garden is such a very successful garden and a tremendous resource within the local Davis school community. The established success of the Birch Lane Elementary School's Courtyard and Garden viable and its strong base of parental support shows that there is community support for school gardens. The Birch Lane example is a positive model for school gardening and empowering to the designers of the North Davis Elementary school project.

During my visit, I was able to witness students in the garden; they were so active and focused on working in the garden. They were not afraid of getting dirty and wet when they dug the soil or watered the plants. One piece of land that children know well is their schoolyard or garden. They are familiar with its physical structure, its rules and its patterns of use. In addition, children spend a lot of time in their schoolyard and garden; according to Cheskey, "Many elementary students spend 15 to 30 minutes in the schoolyard prior to school commencing, 30 minutes during recesses, and 30 to 45 minutes over the lunch period . . . by the end of sixth grade, students have spent as many as 1,800 hours, or 257 school days, just in their schoolyard" (Grant, 5).

As many experimental studies have demonstrated, children will have a positive feeling about themselves when they have a "peaceful" garden at their school: "Sweeping vistas, open water, secluded hiding places, mysterious passageways . . . these are the environmental features that appear to contribute most to our physical and mental well-being" (Grant, 7). Students are not only learning math, science, literature, and other topics in an outdoor classroom, they are also learning valuable life lessons regarding nutrition. Finally, they gain real-world opportunities to observe, interact with, and contribute to the world around them.

In addition, the outdoor classrooms can be places that are spirited and

“Young people who experience the natural environment may develop sensitivity toward natural systems, wildlife, and habitat protection as they grow older.”
(Johnson & Duffek, 2008)

interactive places for integrated and place-based learning. For many students, the garden serves as a place to really engage and interact with the subject matter; "Characterized by natural, cultural, and artistic features, schoolyard or garden outdoor classrooms can be dynamic and evolve through time as children and their leaders make design adjustments and create and re-create the place" (Johnson and Dufferk, 1).

Outdoor classrooms are also places for students to learn about our natural environment, and through hands-on activities in schoolyard or garden projects, students can explore, initiate some pride in their own abilities and accomplishments, and learn about the deep connections between themselves, other people, nature, and the world at large.

Lesson Learned:

From my tour of Birch Lane Elementary School, I identified three keys principles to consider when I try to design or build a garden for a school. The three principles are: connection, education and funding.

The first principle is the connection between parents and school. This key to the success of the design. If they have a great connection, the school activities will be successful in many cases. For example, for "The Castle Courtyard" at Birch Lane Elementary School, the parents felt like they were a part of the school project and they donated thier labor and worked with teachers and students to build the courtyard. Parents were willing to help with their abilities because they wanted their children to have a safe and healthy environment at school.

The second principle is education. The garden must contribute toward the curriculum because gardens provide the opportunity for students, teachers and possibly members of the community to interact. Garden work can teach students how to work cooperatively with each other and interaction may allow for an improvement of interpersonal social skills. School gardens are a wonderful and exciting way to make school subjects more interesting and meaningful to students. A school gardens is also a living entity that can serve as an excellent resource to teach subjects while allowing students to learn in an environment that is not typical of the sterile classrooms to

which most students are accustomed.

The third principle, funding is can determine the success or failure of a garden. Funding issues can stop a grade project dead in its tracks if sufficient planning and alternative funding methods are not explored. Funding can come from many places, the first being the school. Try to ask the school if they have a budget for a garden project. The school may be more likely to fund your garden project if the garden is shown to be an educational tool and classroom asset. Donations could come from teacher or parent organizations and fund-raising activities such as the garden sale (Fig. 2.7) at Birch Lane Elementary School. Also check with local service organizations to see if they can help provide funds for the school garden project. In addition, funding is also available on a national level. The National Gardening Association offers Youth Garden Grants to schools developing gardens, and the most important thing about finding funding is not to be shy. Many businesses and organizations are willing to help local schools and students in worthwhile endeavors. To make this happen, the garden must be sustained by the efforts of individuals who truly believe in the program and receive positive feedback for their effort from the garden and program itself.



Fig. 2.7 Garden sale day at Birch Lane Elementary School, Davis, Ca

Case Study 2 | Fairfield Elementary School Gardens, Davis, CA

Gardens Background:

“We do not have a school office”, one of the teachers told me when I entered the back door of the school because I did not know where the school entrance was. The school is located on a county road in Davis and is only grades K-3 and has about 60 students. I did not realize it was a school when I saw the building, it was so tiny with about 8 parking spots. The school was established over a hundred years ago and it is the oldest elementary school in the Davis District.



Fig. 1.8 Amphitheater at Fairfield Elementary , Davis, Ca

Although the school building is small, their yard is really big for an elementary school; with a big open field and beautiful gardens on the side of the school. The first thing I saw was the amphitheater (Fig. 1.8). It had a small stage, was ADA accessible and was surrounded with wooden benches. It is used as an outdoor classroom.

“The love of gardening is a seed that once sown never dies.”

Gertrude Jekyll (1883-1932)

I arrived at school on Friday morning because the school has a garden program every Friday. Each class has 30 minutes to work in the garden. During the garden time, firstly, the half of the class works with the garden teacher, and the other half works with the garden coordinator, Tyner Tikkanen. I was able to witness students in the garden. They learn very really excited and were learning new things very quickly, “Some of the teachers told me that some students were very excited for Friday because they have a chance to work in the garden. They got up right away when their teacher mentioned about garden class” (Tikkanen, Personal communication, April 17,2009).

The Fairfield Elementary School Garden Program is unique because every student has their own raised bed (Fig. 1.9)



Fig. 1.9 Personal raised bed at Fairfield Garden.

The dimension of the each bed is about 4 feet by 5 feet, “Students and their parents were building these beds, they love it” (Tikkanen Personal Communication, April 17, 2009). Every plant or flower in the Fairfield Garden was grown by students (Fig. 1.10). A great feature of this garden program is that each student has his or her own raised bed and knows how to take care of their own.



Fig. 1.10 Students work in Fairfield Garden

This model is not only for students to learn about the environment, it also provide a great life experience for them in the future, “The parents were proud of their kids when we had the garden show in the last two weeks, the students stood straight up with wide shoulders when they gave their parents the fruits that they had grown” (Tikkanen, Personal Communication, April 17,2009).

Project Significance & Impact:

The Fairfield Garden, like he Birch Lane Garden, is also a tremendously successful garden resource in the Davis School community. The garden is well-organized and unique (Fig. 1.11). The school also has great support from the

community when there is a need for garden projects, such as building the raised beds. In addition, the individual student plots is a powerful tool for kids to learn about the environment and it is a great way to allow kids to express



Fig.1.11 Fairfield Garden, Fairfield Elementary School, Davis, Ca

themselves. They have their own choices to plant whatever they want in their own raised beds. By creating this way, “... [S]tudents learn how to advocate for themselves... students could to be who they are and not what someone else wants them to be, helps students make healthy choices, and promotes independent and self-directed learning and thinking” (Carole G. Basile, 25).

Lesson Learned:

The lessons taken from my visit to the Fairfield Garden were self-advocacy and self-directed learning. The main item I came away with is progressive learning. Seeing the students working in the garden was incredible. It presented a fresh outlook toward the possibilities of an alternative form of education.

Having a spot for each student is not easy, especially in a school that has a lot of students like North Davis Elementary. However, North Davis Elementary School could build the raised bed for each class, where students have their own spots to relieve their school stress, "A school stress sequence will include: the occurrence of a school event, the internal assignment of meaning to the school event, and the occurrence of internal and external responses to the school event" (Edward W. Schultz & Charles M. Heuchert, 22).

After visiting both of these elementary gardens, there is one main idea that must be established. The school garden cannot happen overnight, it will need a lot of support from the community and everyone has to work together to make it happen. The knowledge gained by working in one's own school garden is the most valuable lesson available. I believe that the WAND GARDEN at North Davis Elementary School will be getting a lot of support from the community because it has been a great school for many years.

Chapter 3 | *Data Collection & Result*

Principal Input:

Being the principal of the North Elementary School is a great opportunity for Ramon Cusi to learn more about children’s behavior and growth. I arranged an interview with school principal, Dr. Cusi, to learn more about particular programs the school district has been providing for students. I met with Ramon Cusi in his office and I got some great information.

Q. 1/ How long have you been working at North Davis Elementary School?

“This year is my first year to work at this school. I was a Vice Principal in Southern California. I started in August 2008, when I moved here and I found out there was an available job for a principal, so I applied and I became principal for the North Davis Elementary School.”

Q. 2/ What were your goals when you became a principle for this school?

“My goals were to focus on students so that they can achieve, as a teacher, he/she focuses on the student’s achievement in his/her classroom only, but as a principal, I have to deal with more than 600 students and thousands of parents. But basically the main goal is to focus on students’ achievement, making sure that they are growing academically and socially too.”

Q. 3/ Is there any particular program after school for students?

“We have one of highest district level of art programs. One of the programs

that we have is focusing on students reading skills and language learning. There is also a gifted program for who are talented for grades four to six. We also have a special program for students with special needs.”

Q. 4/ How do you think the connection is between the school staff and parents?

“I think that our goal is to make sure that students grow and academic way, that is really important goal for the community to know that the school is really focusing on that goal.”

Q. 5/ Do you think the parents will volunteer to construct the new garden at your school? Why?

“A lot of parents will volunteer, the city of Davis is going for more green and less waste. It will be a great opportunity to build a concept, but we need to be make sure that not only the architecture structure will work logically and who will be taking care of the garden, so I think the parents will be more than interested in helping us to build the garden for this school.”

Q. 6/ Have you ever done any work in the school garden?

“No. I have not done anything, but if the new garden is going to be built, I think we will spend most of the time in this garden because it will be center point and a lot of foot traffic at well.”

Q. 7/ What do you think of students’ behavior when they are interacted with environment?

“There are a lot of educational programs, one program which we called the recycling program and school staff and students were involved and seemed like they loved it.”

Q. 8/ Where would the money come from if the school garden is built? Have you ever thought about the fundraising, donation ... ?

“I think the grant garden, PTA. Yes we do a lot of of fundraising. PTA will be supportive for this kind of project because this is the way that they spend their financial resources.”

Q. 9/ Are you excited to see a new garden in your school? How so?

“Yes. I really am, it will not be done over night because it will not look good.

“The principal and staff are very hands on and always accessible to parents and students. There is a high level of parent involvement through PTA sponsored projects and volunteer opportunities in the classroom, library, etc. The school promotes a safe, positive learning environment.”
 Parents reviews
 (Source: www.trulia.com. 2007)

We need to take our time and make sure that every one is aware and involved. I hope that the garden will be the pride of our school, and I also want to let people know that we can build our garden by ourselves.”

Q. 10/ Do you think the students would use outdoor classroom as a part of their learning experience?

“I do not see anything wrong with it. They will love to use our outdoor classroom.”

Q. 11/ Are there any particular plants or shrubs that you would like to see in your new school garden?

“Not really. My big concern is worried about the water valves, we need to make sure that there will be no wasting of water, and of course I do not want any small rocks in the garden because I do not want them to fly into windows when it is windy. I want to make sure there is a pathway into garden to let people know that there is place that they are supposed to be where they need to be in the garden.”

(Source: Personal interview, April 14, 2009)

Garden Coordinator Input:

North Davis Elementary School Garden Coordinator, Carolyn Teragawa was the one who came up with the new garden idea for North Davis Elementary School, so I set up an interview with her. It would be helpful to know more about the school expectations and concerns for the garden.

Q. 1/ How long have you been working at North Davis Elementary School?

“I have working at the school for five 5 years. I work in yard supervision and in the RISE (Recycling Is Simple Elementary) lunch recycling program. I started working as the garden coordinator this year.”

Q. 2/ What were your goals at the beginning of the school years (2008-2009) as garden coordinator?

“My goal for this year was to expand already had a “Science Garden” that was used mainly by 4th through 6th graders during their science time. K through 3rd graders usually did not use this area. I wanted to transform the old lawn area in the front

of the school to a teaching landscape that would serve all grade levels.”

Q. 3/ Where did you get the idea that you wanted a new garden for North Davis Elementary School?

“My older children attended school at Willett Elementary where they had a very active garden program. I was a garden coordinator there for several years. I wanted to bring that same kind of program to the students at North Davis. I have seen how it works and how much fun it is for the students to learn about gardening and the environment.”

Q. 4/ Are you excited to see a new garden in your school? How so?

“Yes, I am looking forward to seeing your new plans for the unused lawn area. Developing ideas for the garden and constructing the garden will be a fun and exciting project. When everyone pitches in to help you get a real sense of accomplishment.”

Q. 5/ How long do students have to wait for their parents to pick them up right after school?

“Students in grades 1st through 3rd get out of school about 30 minutes before 4th grade through 6th grades. Sometimes these younger students with older siblings may have to wait for their parents to come and also pick up the older children. Most students do not have to wait long for their parents and many of our students bicycle on their own to and from school so they are not waiting for any pickups.”

Q. 6/ What do you think of the connection between the school staffs and parents?

“In general, I think there is a good connection between staff and parents. If you look at connections in the classroom, there can be a lot of variation from year to year and class to class. In some years, teachers have plenty of parent volunteers and in other years, they have none.”

Q. 7/ Do you think the parents will volunteer to construct the new garden at your school? Why?

“Yes, I think we have some parent participation. I have spoken with several people who really like the idea of school gardening and have expressed their interesting helping. Many people in Davis are interested in growing and eating

healthy food. They would welcome the chance for their children to participate in a school garden program.”

Q. 8/ Have you ever done any garden design with student at this school? If yes, when and where?

“I have not done any garden designing with these students. I did design a garden area when I was coordinator at Willett Elementary.”

Q. 9/ What do you think of student’s behavior when they are interacted with environment?

“When students get outside and start digging or weeding or planting, they bring a real eagerness and excitement to their task. The whole experience is very fun for them. The key is to keep their excitement focused on their garden studies.”

Q. 10/ Where would the money come from if the school garden is build? Have you ever thought about the fundraisings, donations?

“We already have some money set aside from PTA. We are also applying for small grants and have received one from the Davis Co-op. We may also get some direct donations from parents.”

Q. 11/ Do you think the students would use outdoor classroom as a part of their learning experience?

“If teachers can work it into their curriculum, I think the students would love to go outside and do some hands-on learning in the garden. It is also a great idea to let kids work on the garden design; I am sure they will come up with some fun and unexpected ideas.”

Q. 12/ Are there any particular plants or shrubs that you would like to see in your new school’s garden?

“I like to use a lot of herbs in the landscape as many of them are attractive and drought tolerant. I think it would be great if people could snip herbs from the school garden and use them in their dinner that evening. I also like California Native Plants.”

(Source: Personal interview, April 14, 2009)

Student Input:

In designing a school garden, it is important to consider all of the elements in the garden that are useful for students to learn about and for teachers to teach. For this school garden project, I would like to use “The Inclusive Design Process” which helps me to collect input from the students of the school and to incorporate the collective ideas into a design for the school garden. So what is “The Inclusive Design Process”? “The inclusive design process invites students to contribute creative ideas and provides input in the design before the garden installation. It emphasizes consideration of how the garden will be used, rather than its appearance, and puts the creative power in the hands of the school team” (source: www.egarden.org). The inclusive design process can aid in developing the appropriate adaptations to the garden to meet the need of individuals with special needs.

“Gardening is about enjoying the smell of things growing in the soil, getting dirty without feeling guilty, and generally taking the time to soad up a little peace and serenity.”
Lindley Karstens

After I talked to the school garden coordinator, Carolyn Teragawa, I wanted to hold a design workshop with students. She introduced me to Kathy Froman, who is a 4th grade science teacher at North Davis Elementary School.

During the first meeting on April 28th, 2009, I met Ms. Froman, Ms. Teragawa, and the students at the site and I explained how the real site corresponded to the actual scale in the landscape drawing. Two days later, during the second meeting, I meet with students in the classroom and started the design process (Fig. 3.1 , 3.2, 3.3). In this



Fig. 3.1 Students worked on garden design 1, North Davis Elementary School, Davis, Ca



Fig. 3.2 Students worked on garden design 2, North Davis Elementary School, Davis, Ca



Fig. 3.3 Students worked on garden design 3, North Davis Elementary School, Davis, Ca

science class, the teacher already divided students into eight groups so the students knew what group that they were supposed to be in. There were 26 students present for this workshop day. In this meeting I brought eight base maps, tracing paper, and

markers for students to draw with. In addition, before starting the design, I let the students know what elements had to be in their design. there were ADA accessibility, raised beds, and compost bins. In this meeting, I also posted the survey questions that I thought would be helpful for me to develop a garden. The survey questions and answers are as follows:

1. Would you be interested in taking part in the design of a school garden?

22 Yes - 4 Maybe - 0 No

2. Would you be interested in seeing that the foods you eat are actually coming from your school garden?

22 Yes - 3 Maybe - 1 No

3. Would you be interested in taking care of plants in the school garden?

15 Yes - 9 Maybe - 2 No

4. Would you be interested in helping with construction of garden?

15 Yes - 9 Maybe - 2 No

The result of this survey is not particularly surprising because the students were so interested in the garden project. They were really focused on the design process and worked together well as teams. The overall idea that I got from this design workshop day was that students love to be involved in the garden design and they pay really close attention to some plants and flowers that they want to see in the new garden. They want to design and have a garden that they can be proud of.

Faculty Input:

Faculty input was not similar to that of the student input because every faculty member has his/her own schedule. However, Ms. Teragawa and I decided that we could hand out the survey questions by putting them into staff mailboxes at school. The survey questions and answer are as follows:

1. Would you be interested in doing your own personal gardening on campus?

3 Yes (25.0%) --- 3 Maybe (25.0%) --- 6 No (50.0%)

2. Would you be interested in bringing any of your classes out to the garden?

10 Yes (77.0%) --- 1 Maybe (7.7%) --- 2 No (15.3%)

3. Would you be interested in incorporating the garden into any part of your curriculum?

10 Yes (71.4%) --- 2 Maybe (14.3%) --- 2 No (14.3%)

4. Would you be interested in having an entire garden plot or portion of a plot dedicated to your class or classes to use?

3 Yes (25.0%) --- 4 Maybe (50.0%) --- 3 No (25.0%)

When I collected the survey questions sheet, the faculty members wrote down what they would like to have in the school garden. Some of them want to have a butterfly garden in their school so they can hunt for monarch caterpillars.

Project Development/ Design Process:

Throughout the input and site analysis processes, I came up with two conceptual bubble diagrams that I thought that it would be helpful for me to develop a final master plan.

Firstly, I tried to arrange several alternative loose arrangements of zones and spaces (Fig. 4.1 and 4.2). On this stage, I also tried to determine the size and

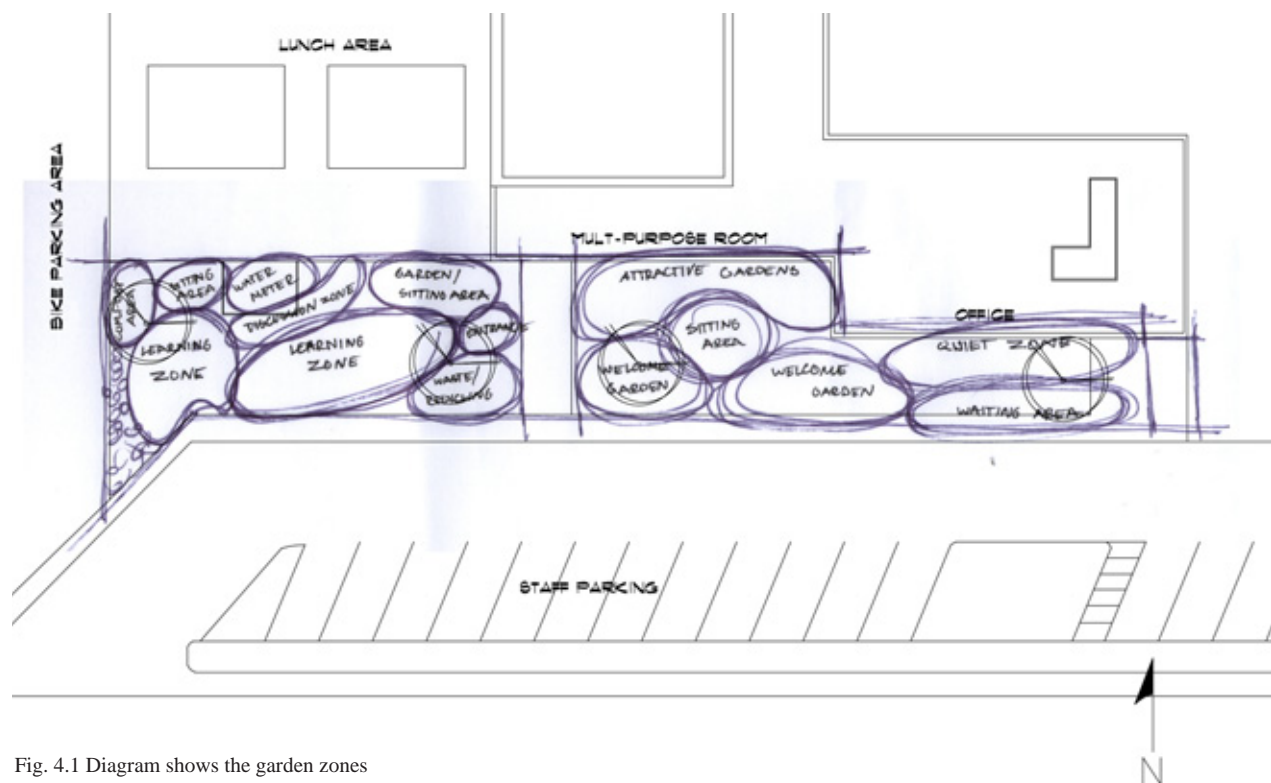


Fig. 4.1 Diagram shows the garden zones

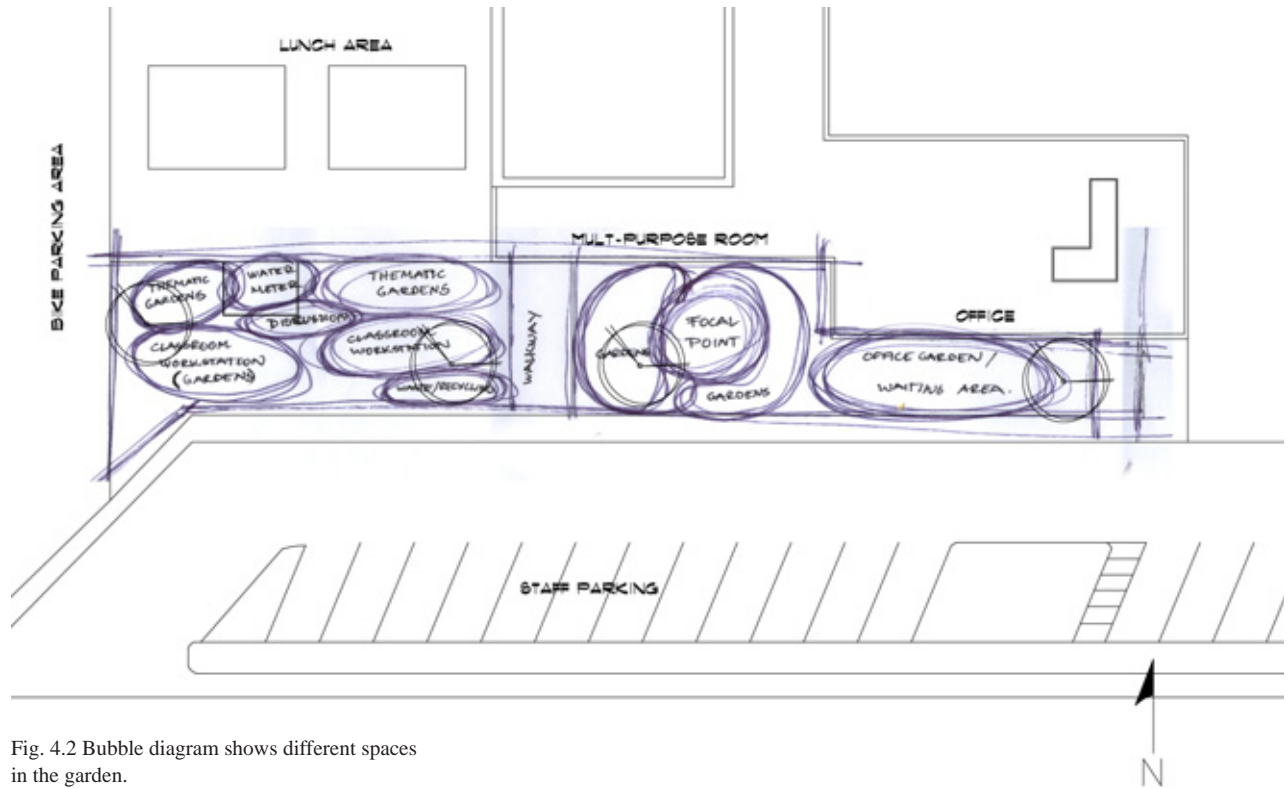


Fig. 4.2 Bubble diagram shows different spaces in the garden.

Secondly, I tried to come up with two options for conceptual designs; one with a natural feeling (Fig. 4.3) and the other with a formal look (Fig. 4.4). During discussions with professors, the school principle, and the garden coordinator, I reached the conclusion that two liked the formal look and two liked the natural feeling, which was

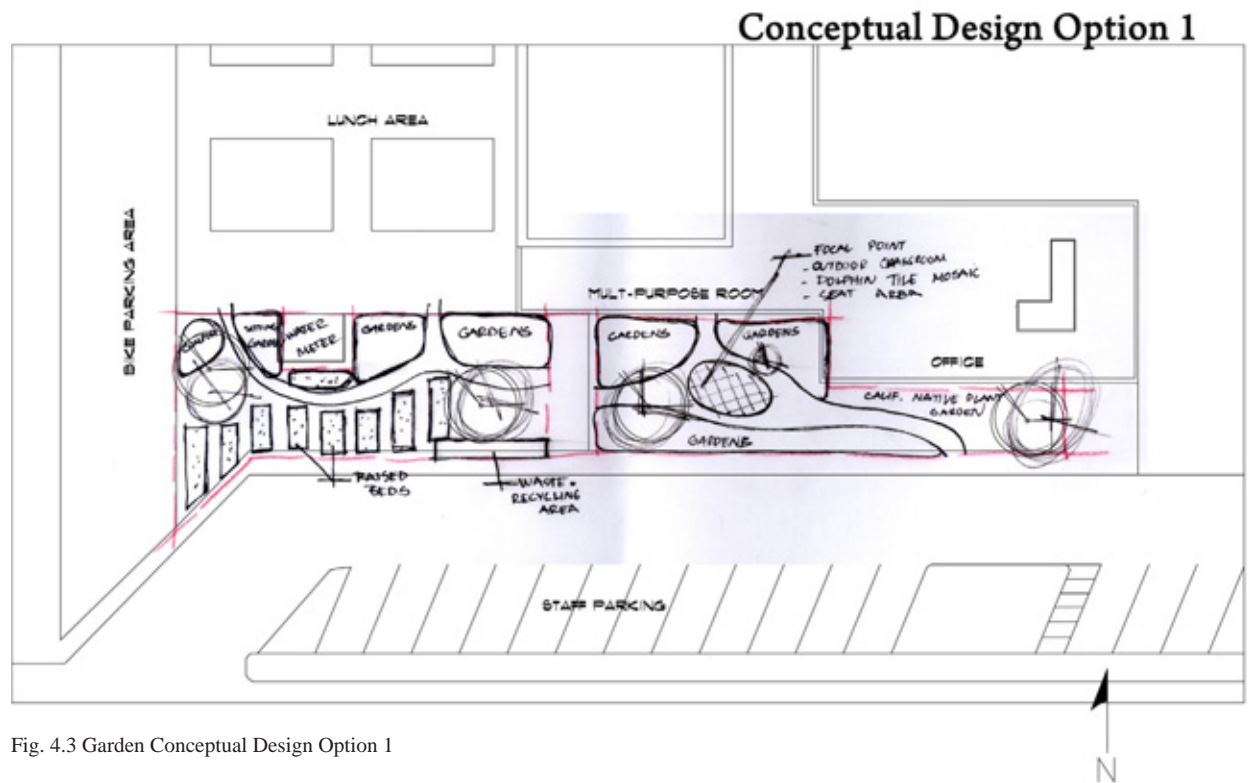


Fig. 4.3 Garden Conceptual Design Option 1

Conceptual Design Option 2

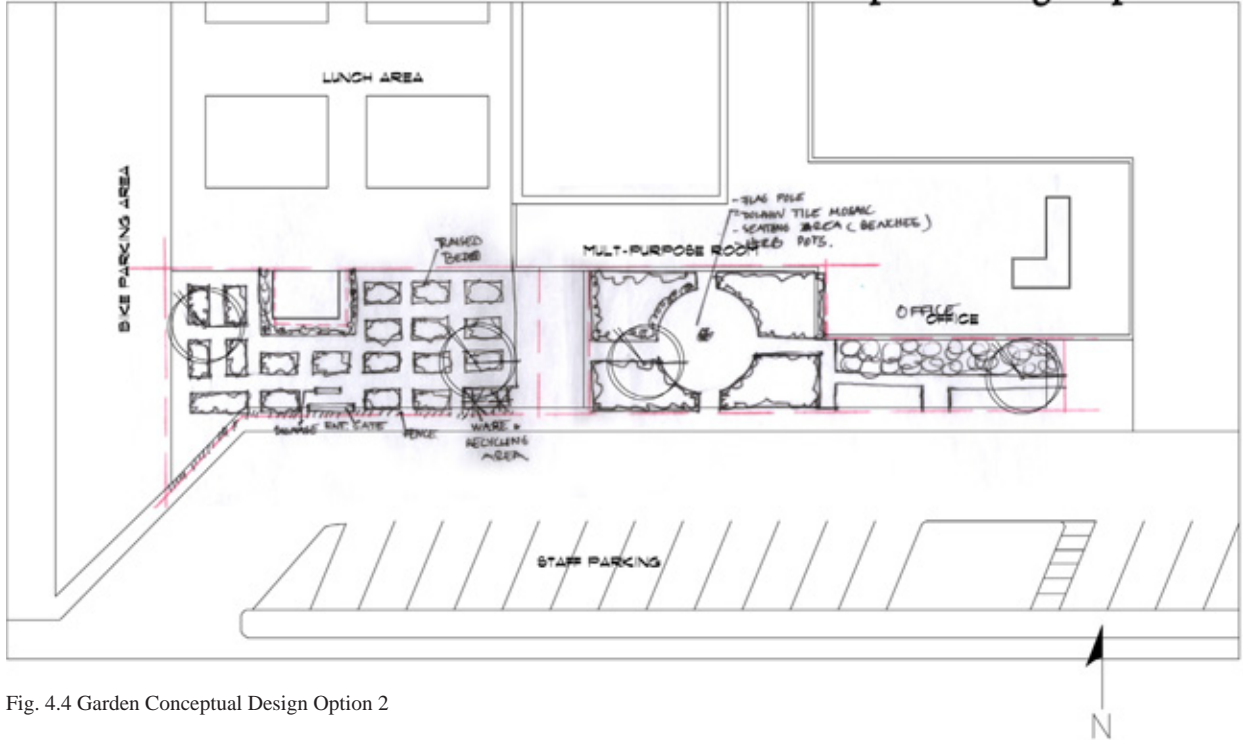


Fig. 4.4 Garden Conceptual Design Option 2

included me. So I thought that it would be a great idea to combine two options into one and I procuded a well-organized plan.

Project Goals:

The goal for the North Davis Elementary School is to design and develop multi-use open spaces that complement the primary mission of the school: to preserve and foster children’s innate sense of curiosity and give them the tools and skills needed to become lifelong learners. The garden will provide a rich environment for teaching and learning. School grounds that are designed with care and attention provide students with real-world opportunities to observe, interact with, and contribute to the world around them. “A rich environment on school grounds significantly enhances formal and informal learning opportunities for children in both the school and community.” (Source: www.schoolyards.org)

The following list also shows the general various needs of wildlife, students, teachers, and administrators. Based on

Wildlife Needs:

- Food (feeding stations, native plants)

- Water (drippers, birdbaths,)
- Spaces (safe and open places)

Students' Needs:

- Natural areas for play and learning
- A variety of learning activities (science projects, artworks)
- A variety types of spaces (active areas, private spaces)
- Shade

Teachers' Needs:

- Inspiring places to teach
- Learning stations
- Curriculum support
- Noise control

Administrators' Needs:

- Means to inspire and facilitate teachers
- Good management and maintenance of the garden
- Workable budgets
- Community/Volunteer support

More important, the following shows the main goals for the WAND GARDEN:

- Create a multi-functional space
- Incorporate student art
- Increase views from the street
- Create a sustainable garden
- Allow for ADA accessibility
- Create outdoor classroom
- Create a space for waste and recycling
- Buffer between the garden and parking lot (fencing)
- Extend the driveway for loading truck
- Paint an outdoor mural on concrete wall
- Build raised beds
- Create and install interpretive signs

THIS PAGE IS FOR MASTER PLAN

Program Elements Description:

I used the survey information from North Davis Elementary teachers and students to create an arrangement of thought (Fig. 4.5).

Range of Thoughts..

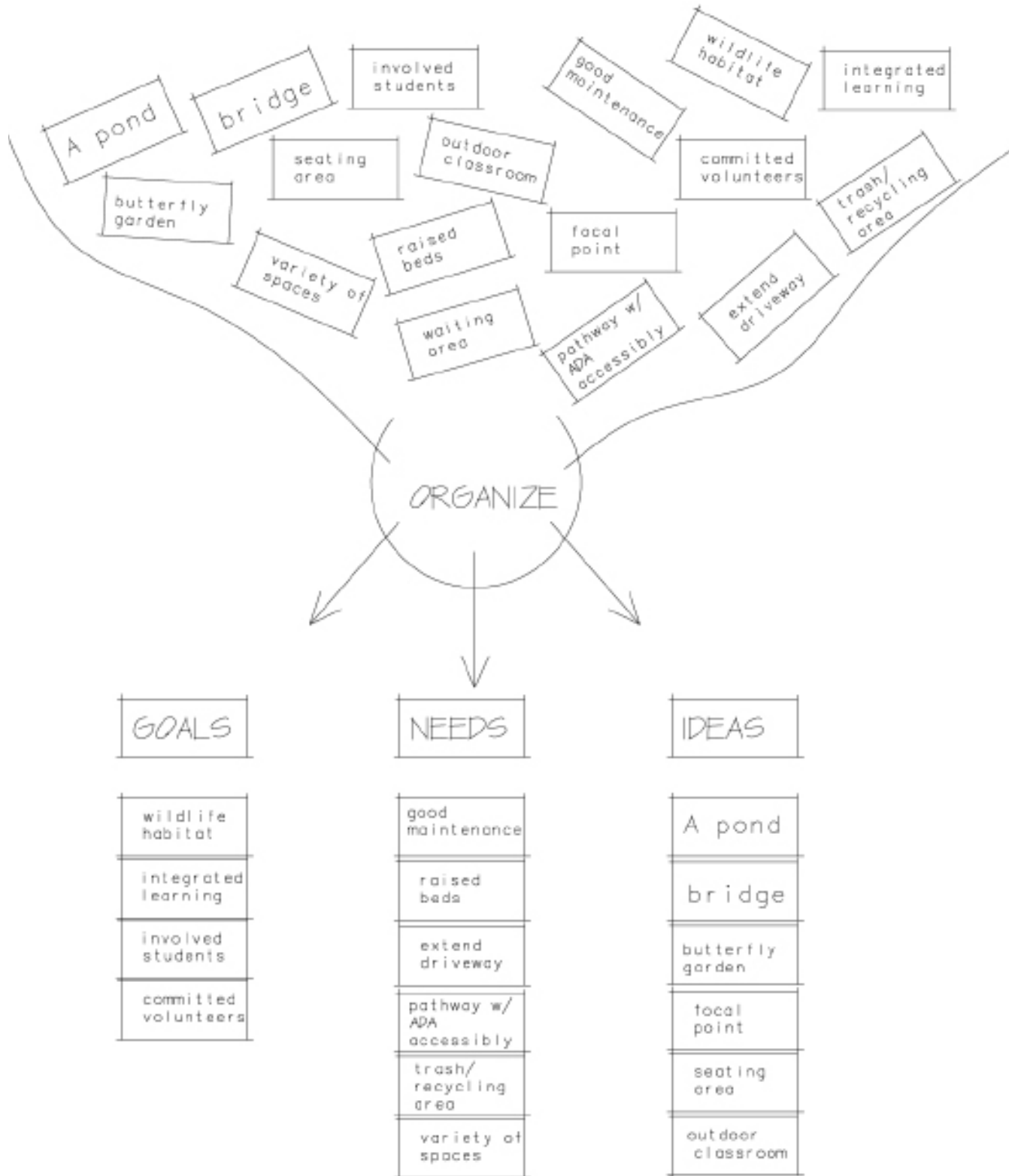


Fig. 4.5 Range of thoughts

Although the garden is a relatively small space, the goal of the design was to efficiently take advantage of the formal shape of the existing area to create a multi-functional instructional garden. The design hopes to balance two unified gardens; one for learning and one for experience, and also one California Native Plants garden for those who work in the school offices. I hope to transform the current area from a boring and minimally used state into an interactive and a productive garden that will be inviting and comfortable for the entire campus community to enjoy and proudly call their own.

The design has some significant elements that I want to include in the design. Firstly, the focal center of the Sensory Garden (Fig. 4.6) is a circular tile dolphin mosaic, which is to be student designed and implemented. There are also four low seatwalls. The seatwalls can be composed of any material readily available. They could be stone,



“In my garden there is a large place for sentiment. My garden of flowers is also my garden of thoughts and dreams. The thoughts grow as freely as the flowers, and the dream are as beautiful.”
 Abram L. Urban

Fig.4.6 Sensory Garden, North Davis Elementary School

brick, or wood. They create a gathering space in this center focal area and can also be useful if teachers or students have presentations. In addition, there are two decomposed granite pathways which connect to this focal center area, one from the south and the other from the west. This pathway must be created for ADA accessibility. The new California Native Plants Garden (Fig. 4.7) in front of the school office would be an attractive and great place for people who work in the office. They can see the garden while they are working by looking through the glass window. There are also two seatwalls in this garden to allow parents a rest area while they are waiting for their kids. Parents can sit here, wait for their kids and enjoy the garden at the same time.



Fig. 4.7 California Native Plants Garden, North Davis Elementary School

The Productive Garden (Fig. 4.8) would have nine raised beds classes who want to maintain plants. These raised beds are filled with edible planting such as carrots, onions, cabbage ... etc. There is also a pathway to separate the raised beds and the thematic garden. The three foot high bridge would be focal point in this productive garden and be a great element for students to experience. In addition, on the left corner of the site, there is a Butterfly Garden for the staff who wished for a butterfly garden for their class to hunt for monarch caterpillars in the fall. There are also compost bins and an earthworm bin located to the west of the site.



Fig.4.8 Productive Garden, North Davis Elementary School,

Final Design Perspectives:



Fig.4.9 Aerial Perspective looking northeast 1



Fig.4.10 Aerial Perspective looking north



Fig.4.11 Aerial Perspective looking northeast 2



Fig.4.12 Aerial Perspective looking southeast

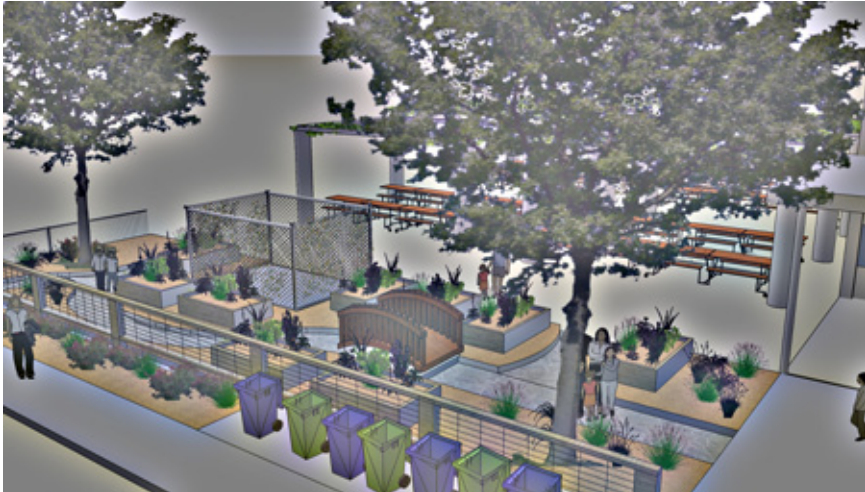


Fig.4.13 Aerial Perspective looking northwest



Fig.4.14 Aerial Perspective looking northeast 3



Fig.4.15 Section-View from the street

Chapter 5 | *Garden Development & Management*

Compost:

By definition, compost is the “aerobically derived remnants of organic materials,” (Source: Wikipedia, 2009) meaning what you get when you combine the leftovers of plant and animal-based stuff with added air, water and nitrogen. What is first use? It is useful for erosion control, land and stream reclamation, wetland construction, and as a landfill cover. It is nature’s gift to the gardener.

Compost encourages earthworms and other beneficial organisms whose activities help plants grow strong and healthy. It provides nutrients and improves the soil. Wet clay soils drain better and sandy soils hold more moisture if amended with compost.

But how do you make compost? The following is the direction how to make compost:

- Start with a layer of chopped leaves, grass clippings and kitchen waste like banana peels, eggshells, old lettuce leaves, apple cores, coffee grounds ... etc.
- Keep adding materials until you have a six-inch layer, then cover it with three to six inches of soil, manure, or finished compost.
- Alternate layers of organic matter and layers of soil or manure until the pile is about three feet tall. A pile that is three feet tall by three feet square will

generate enough heat during decomposition to sterilize the compost. This makes it useful as a potting soil, topdressing for lawns, or soil-improving additive.

- Your compost pile may benefit from a compost activator. Activators get the pile working, and speed the process. Alfalfa meal, barnyard manure, bone meal, cottonseed meal, blood meal, and good rich compost from a finished pile are all good activators. Each time you add a layer to your pile, sprinkle on some activator and water well.
- When your compost is ready, it can be mixed into the soil before planting or applied to the surface of the soil as mulch. It's best to use it as soon as it is ready because the longer it sits, the fewer nutrients it will contain.

(Source: www.composting101.com)

What to compost:

- Kitchen waste
- Lawn clippings
- Chopped leaves
- Shredded branches
- Garden plants
- Shredded paper
- Weeds
- Straw or hay
- Newspaper
- Wood ash
- Tea leaves and coffee grounds

What not to compost

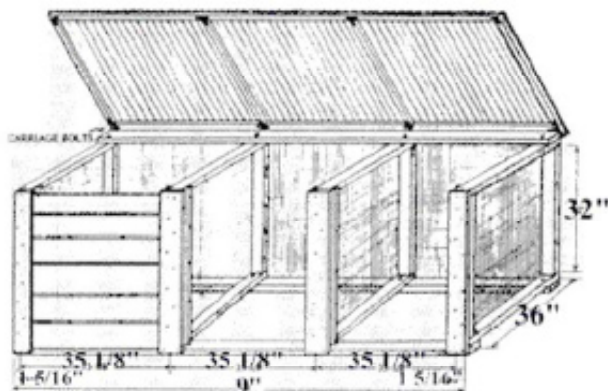
- Meat scraps and fatty trash
- Excessive wood ashes
- Sawdust generally slows the decomposition of the pile



WOOD & WIRE STATIONARY 3-BIN SYSTEM



This system is used to compost large amounts of yard and kitchen wastes in a short period of time. Compost piles are made and turned on a regular basis. This unit can be built for approximately \$248. Construction requires basic carpentry skills and tools.



MATERIALS

- 2 - 18' 2"x4"s *
- 4 - 12' or 8 - 6' 2"x4"s *
- 1 - 9' and 2 - 6' 2"x2"s
- 1 - 16' cedar 2"x6"
- 9 - 6' cedar 1"x6"s
- 22' of 36" wide 1/2" hardware cloth
- 12 - 1/2" carriage bolts 4" long
- 12 washers and 12 nuts for bolts
- 2 lbs of 3 1/2" galvanized nails
- 1/2 lb. 2 1/2" galvanized casement nails
- 200 poultry wire staples (or rent power stapler with 1" staples)
- 1 - 12' and 1 - 8' sheet 4 oz. clear corrugated fiberglass
- 3 - 8' lengths of wiggie molding
- 40 gasketed aluminum nails for corrugated fiberglass roofing
- 2 - 3" zinc-plated hinges for lid
- 8 flat 4" corner braces with screws
- 4 flat 3" t-braces with screws

Fig.5.1 Compost Bin Construction (www.backyardGardener.com)

THIS PAGE IF FOR PLANTING PLAN

Planting List:

The following is the plant selection that Ms. Taregawa and I had worked together to come up with the final decision of plants selection. Ms. Taregawa paid a lot of attention in the Productive Garden plants selection. She wanted to pick up vegetables are the best when get straight from the garden rather than from a shop. Some kinds of food needed to keep children strong and healthy.

Scientific Name	Common Name	Sun	Part	Shade	Water	Form
Ocimum basilicum	Basil	X			Low	Annual
Laurus nobilis	Sweet Bay	X	X	X	Low	Shrub
Borago officinalis	Borage	X	X	X	Low	Annual
Achillea	Yarrow	X	X	X	Low	Perennial
Buddleja	Butterfly Bush	X	X	X	Low	Shrub
Hemerocallis fulva	Daylily			X	Low	Perennial
Festuca glauca	Blue Fescue	X	X	X	Low	Shrub, Perennial Annual
Duchesnea indica	Indian Mock Strawberry	X	X	X	Low	Perennial
Buxus microphylla japonica	Japanese Boxwood	X	X	X	Low	Shrub
Phlox subulata	Moss Pink	X	X	X	Low	Perennial, Annual

Scientific Name	Common Name	Sun	Part	Shade	Water	Form
Syringa Vulgaris	Lilac			X	Low	Shrub
Muhlenbergia rigens	Deergrass	X	X	X	Low	Perennial
Sternbergia lutea	Yellow Autumn Crocus	X			Low	Perennial
Gomphrena globosa	Parsley	X	X	X	Mod	Perennial, Annual
Anethum graveolens	Dill	X			Low	Annual
Baccharis pilularis	Cototebrush	X			Low	Shrub
Rosa 'Scarlet Flower Carpet'	Scarlet Flower Carpet Rose	X	X	X	Low	Shrub
Vinca major	Periwinkle	X			Low	Perennial
Zephyranthes	Fairy Lily	X	X	X	Low	Perennial
Hedera helix 'Gold Heart'	Gold Heart English Ivy			X	Low	Evergreen
Viola tricolor	Johnny Jump Up	X	X	X	Low	Perennial ,Annual
Oenothera speciosa	Mexican Evening Primrose	X	X	X	Low	Perennial
Woodwardia fimbriata	Giant Chain Fern		X	X	Low	Fern
Heuchera 'Lillian's Pink'	Lillian Pink Coral Bells	X	X		Low	Perennial

Scientific Name	Common Name	Sun	Part	Shade	Water	Form
<i>Neomarica caerulea</i>	Walk Iris			X	Low	Perennial
<i>Origanum vulgare</i>	Dwaft Oregano	X	X	X	Low	Perennial
<i>Aquilegia eximia</i>	Serpentine Columbine		X	X	Low	Perennial
<i>Nepeta x faassenii</i>	Hybrid Catmint	X	X	X	Low	Perennial
<i>Salvia clevelandii</i>	Cleveland Sage	X			Low	Perennial
<i>Solidago californica</i>	California Goldenrod	X	X	X	Low	Perennial
<i>Mimulus aurantiacus</i>	Sticky Monkey Flower	X	X	X	Low	Perennial
<i>Rosmarinus officinalis</i>	Rosemary	X			Low	Shrub
<i>Lavandula angustifolia</i>	Lavender	X			Low	Perennial
<i>Mellisa officinalis</i>	Lemon Balm	X	X		Low	Perennial
<i>Thymus vulgaris</i>	Thyme	X		X	Low	Perennial
<i>Stachys byzantine</i>	Lamb's Ear	X			Low	Perennial
<i>Aloysia triphylla</i>	Lemon Verbena	X			Low	Shrub
<i>Allium schoenoprasum</i>	Chives	X	X	X	Low	Perennial

Chapter 6 | Conclusion

What can I say? This project is an INCREDIBLE experience which I have achieved!

Being an immigrant person who came to the U.S from Vietnam in 2001 with no experience in design and not knowing any word in the new language at all, I am proud of myself to make it this far in my life. I have struggled in school for eight years and have learned a lot of experiences in life, and senior project is one of them: is the most incredible rewarding learning experience for me to interact with children and to deal with the many inputs that I got back from the school such as from the principal, garden coordinator, faculty and students.

When I came to the U.S, I was a 19 year-old and I did not have an opportunity to go to middle or high school. I did not know how the children behave and how they interact with environment. However, when I started to work on my senior project, I had a great opportunity to discover the children's activity in the school. I was able to visit some truly inspiring spaces. I listened and learned about the experience from people of all ages in the community. Overall, this journey has exposed me to the true power of community.

North Davis Elementary School is a great school in Davis District. My goal for this project is to create a school garden so that it becomes a very enjoyable space in the school, a space which the students and faculty alike can enjoy working in and feel as though they can call their own.

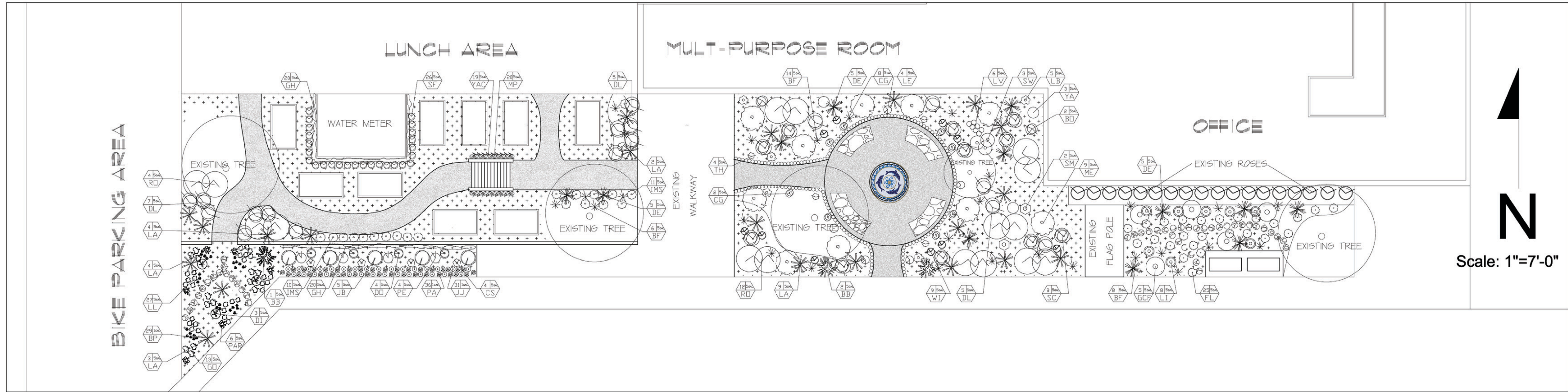
My design included all the elements that the students, parents and faculty' need in the garden for their curriculum such as raised beds, butterfly garden, place to sit . . . etc. On the other hand, what are the next steps for Wand Garden at North Davis Elementary School? Hopefully, the garden plan will get an approval of the head of the maintenance and operations department at the school district, so the garden will be built soon. Although my senior project is done at this point, I will be available to help with any changes in the garden plan this summer, 2009. I will be more than happy to help them to modify the plan if they need to get an approval, so the school will have a new garden for the upcoming year.

In the end, I would like to say thank you to Carolyn Teragawa again for a great opportunity for the North Davis Elementary School Project. I hope that the garden can take shape and take on its own identity within the school community of Davis. The participatory process has driven the design, and hopefully created a foundation. Perhaps the project as a whole can become a testament to the great power of ideas.

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"WAND GARDEN"- PLANTING PLAN



SHRUBS LIST

	PLT KEY	Botanical Name Common Name	QTY	SIZE	PLT KEY	Botanical Name Common Name	QTY	SIZE	PLT KEY	Botanical Name Common Name	QTY	SIZE	PLT KEY	Botanical Name Common Name	QTY	SIZE
Strawberries Mints																
Beets Okras	BB	<i>Buddleia davidii</i> Butterfly Bush	3	5GAL	LL	<i>Syringa vulgaris</i> Lilac	27	5GAL	PE	<i>Vinca major</i> Periwinkle	4	5GAL	WI	<i>Neomarica caerulea</i> Walk Iris	9	5GAL
Chives Onions	DL	<i>Hemerocallis fulva</i> Daylily	17	5GAL	DE	<i>Muhlenbergia rigens</i> Deergrass	12	5GAL	RO	<i>Rosmarinus officinalis</i> Rosemary	14	5GAL	DD	<i>Origanum vulgare</i> Dwarf Oregano	4	5GAL
Broccolis Parsnips	LA	<i>Lavandula angustifolia</i> Lavender	22	5GAL	YAC	<i>Sternbergia lutea</i> Yellow Autumn Crocus	19	5GAL	FL	<i>Zephyranthes</i> Fairy Lily	25	5GAL	SC	<i>Aquilegia eximia</i> Serpentine Columbine	10	5GAL
Cabbages Potatoes	SF	<i>Rosa 'Scarlet Flower Carpet'</i> Scarlet Flower Carpet Rose	26	5GAL	PAR	<i>Gomphrena globosa</i> Parsley	6	5GAL	JJ	<i>Viola tricolor</i> Johnny Jump Up	31	1GAL	CS	<i>Salvia clevelandii</i> Cleveland Sage	4	5GAL
Carrots Tomatos	IMS	<i>Duchesnea indica</i> Indian Mock Strawberry	21	5GAL	DI	<i>Anethum graveolens</i> Dill	3	5GAL	ME	<i>Oenothera speciosa</i> Mexican Evening Primrose	9	5GAL	CG	<i>Solidago californica</i> California Goldenrod	8	5GAL
Cauliflowers Basil	JB	<i>Buxus microphylla japonica</i> Japanese Boxwood	5	5GAL	BP	<i>Baccharis pilularis</i> Coyotebrush	29	5GAL	GCF	<i>Woodwardia fimbriata</i> Giant Chain Fern	5	5GAL	SM	<i>Mimulus aurantiacus</i> Sticky Monkey Flower	2	5GAL
Lettuces	MP	<i>Phlox subulata</i> Moss Pink	20	5GAL	LE	<i>Mellisa officinalis</i> Lemon Balm	4	5GAL	LI	<i>Heuchera 'Lillian's Pink'</i> Lillian's Pink Coral Bells	8	5GAL	BF	<i>Festuca glauca</i> Blue Fescue	28	5GAL
	GH	<i>Hedera helix 'Gold Heart'</i> Gold Heart English Ivy	40	5GAL	PA	<i>Viola X wittrockiana</i> Pansy	36	1GAL	TH	<i>Thymus vulgaris</i> Thyme	4	5GAL	LB	<i>Stachys byzantine</i> Lamb's Ear	5	5GAL
	LV	<i>Aloysia triphylla</i> Lemon Verbena	6	5GAL	SW	<i>Laurus nobilis</i> Sweet Bay	3	5GAL	BO	<i>Borago officinalis</i> Borage	2	5GAL	YA	<i>Achillea</i> Yellow	2	5GAL

WAND GARDEN CONCEPTUAL MASTER PLAN

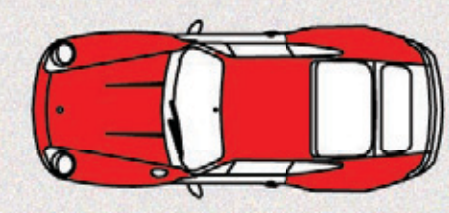
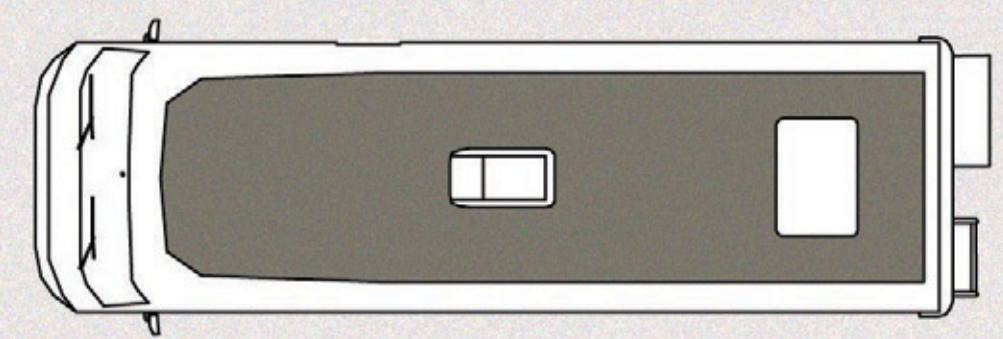
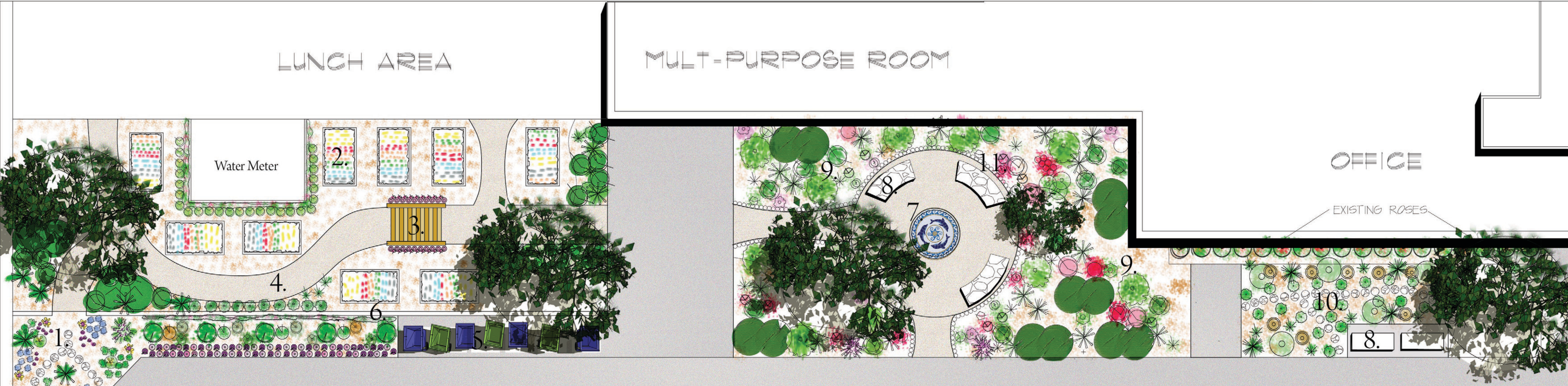
LUNCH AREA

MULT-PURPOSE ROOM

OFFICE

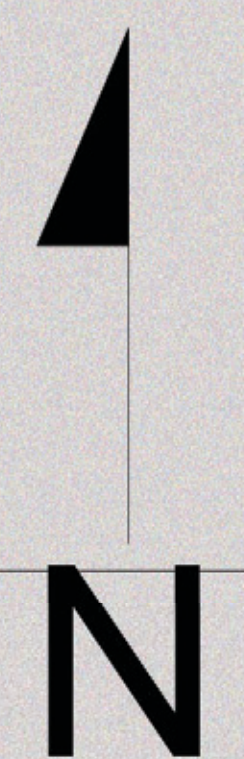
EXISTING ROSES

Water Meter



Legend:

- | | |
|-------------------------------|-------------------------------------|
| 1. Butterfly Garden | 7. Tile Dolphin Mosaic |
| 2. Raised Beds | 8. Benches |
| 3. Wooden Bridge | 9. Sensory Garden |
| 4. Decomposed Granite Pathway | 10. California Native Plants Garden |
| 5. Trash/Recycling Area | 11. Wooden Border |
| 6. Wooden & Wire Fence | |



Scale: 3/16" = 1'-0"