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Executive Summary

Clara Barton Elementary School Project was conducted by the Temple University Senior Landscape Architecture Studio during fall 2014. The project involved a comprehensive study of the School to transform the site into an eco-friendly school by integrating principles of green infrastructure and best management practices. The goal was to create designs for an educational and active environment for children, teachers, and the community.

School properties cover a vast area of impervious paving, such as asphalt and concrete. This condition is highly unsightly, environmentally unfriendly, deprives any greening in the environment, and imposes higher water tax penalty on schools in some cities. It deprives teachers and students from interacting within an aesthetic and healthy setting.

Our Design Studio enthusiastically took the challenge to create sustainable designs for Clara Barton Elementary School. Through the design process we performed an extensive site inventory and analysis of the school and adjacent areas and researched relevant case studies to inform the design development process. We examined the school's history; uses of the schoolyard and relationship to classrooms; pedestrian and vehicular circulation including parking and service areas; views and aspect; micro-climate and wind patterns; hardscape materials and site furnishings; utilities; soils, topography and drainage; site lighting; and existing and projected use of the space. We created final designs that accommodated the goals and objectives for the project.

As designers, we wanted to present Clara Barton Elementary School with suitable design solutions that would provide an educational and active environment for children as well as enhance their mental, physical, and emotional well-being. We hope that our designs will be helpful to the Bordentown School District and serve as a model for other schools.

DESIGN STUDIO PROFESSOR





Dr. Lolly Tai, is Professor at Temple University and a licensed landscape architect whose work is focused on sustainable landscape design. Tai's experience involves a wide range of landscape architectural design projects of varying scope and scales. She incorporates innovative technologies of best management practices, green infrastructure, and forward-looking strategies into her classroom projects. Tai's research focuses on designing spaces that afford children the opportunity to engage in creative and active play. These are important aspects that affect children's mental, moral, emotional and physical development. She is the author of the acclaimed book, "Designing Outdoor Environments for Children" (McGraw-Hill, 2006). She is a Fellow of the American Society of Landscape Architects, a recipient of the Bradford Williams Medal from the American Society of Landscape Architects and the Award of Distinction from the Council of Educators in Landscape Architecture. She holds a BLA from Cornell University, a MLA from Harvard University, and a PhD from Heriot Watt University, Scotland.

DESIGNERS









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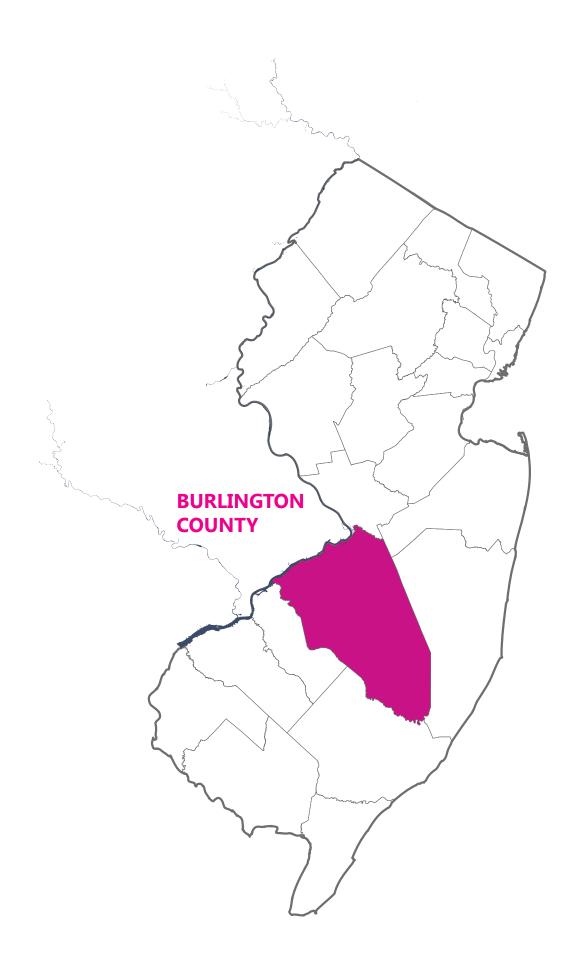


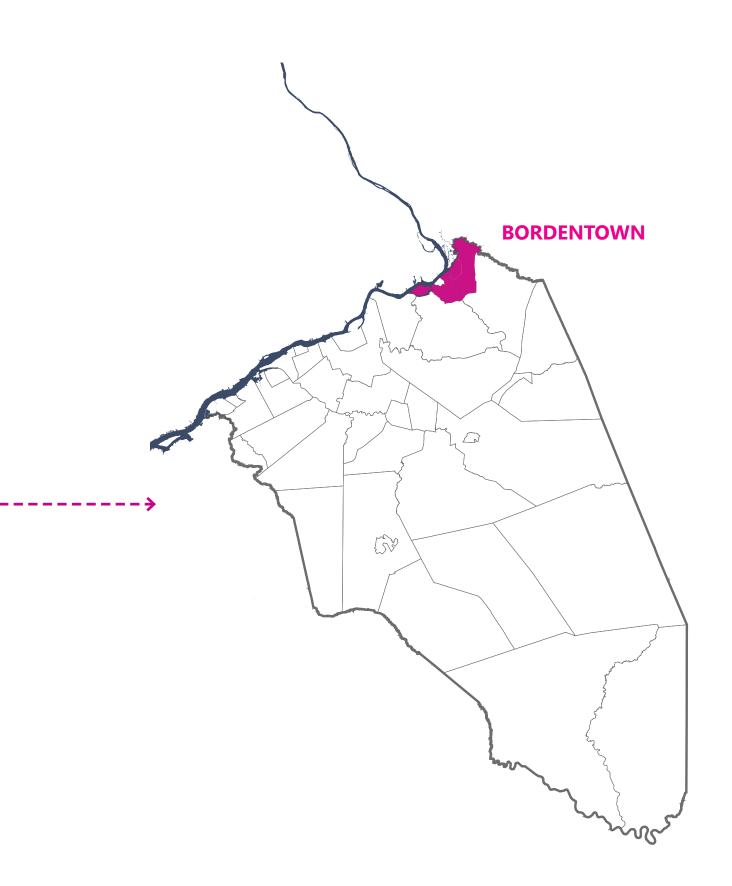


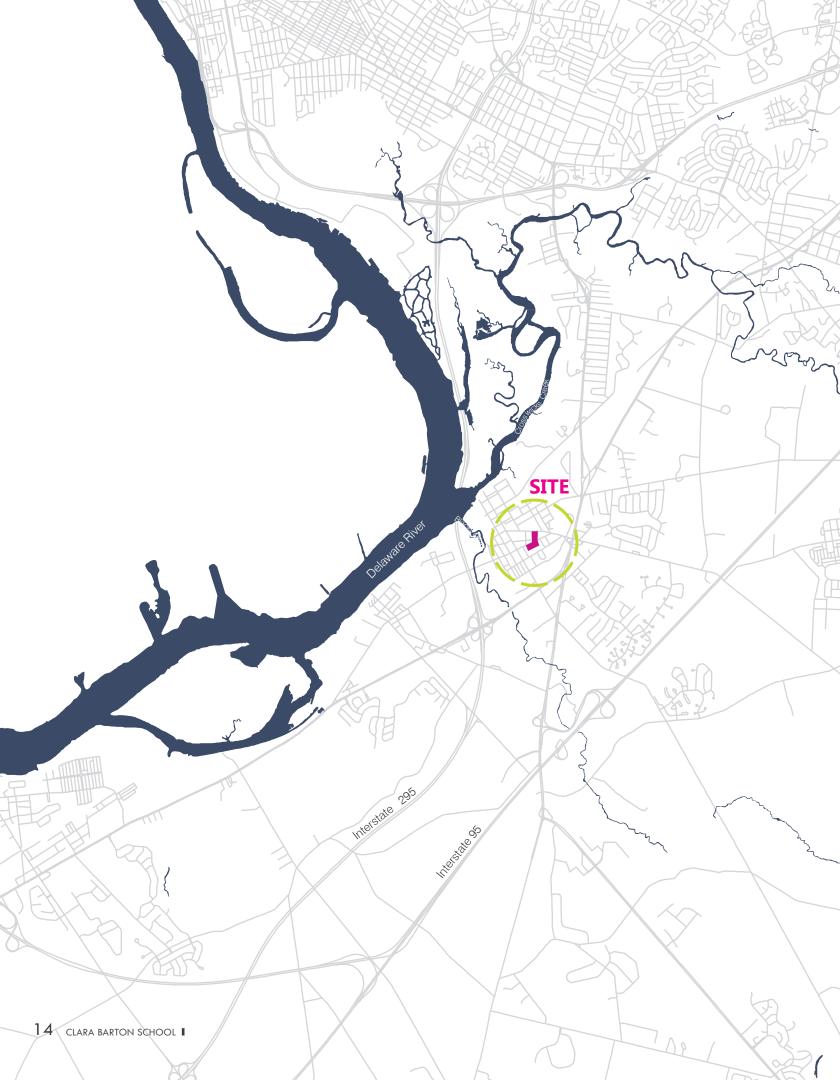
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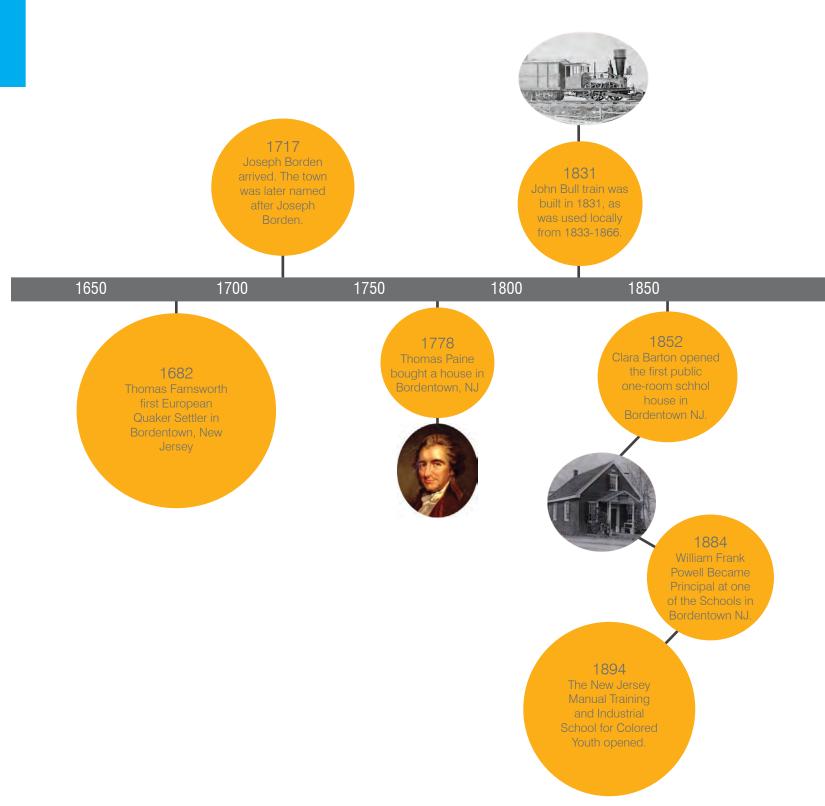


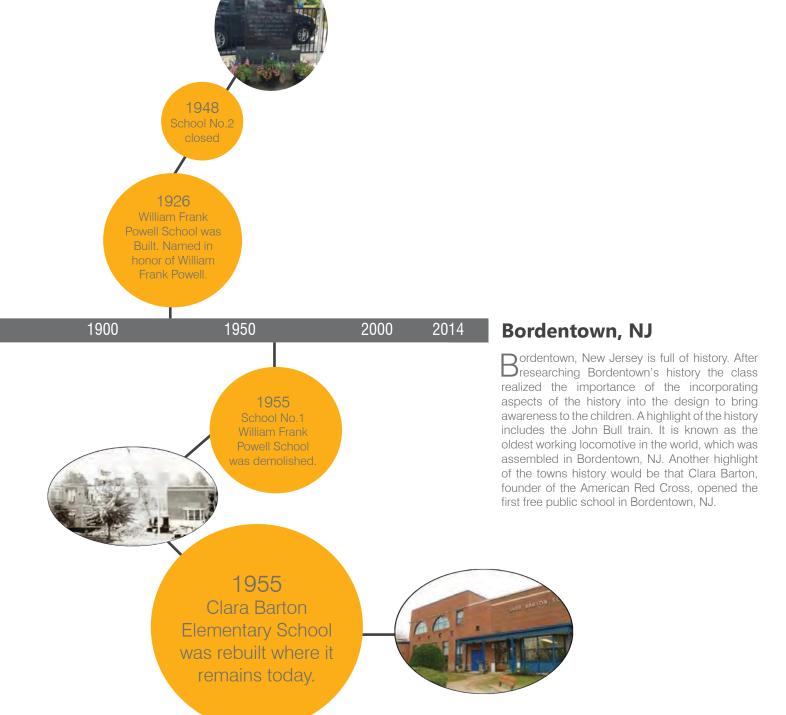
INVENTORY & ANALYSIS

Why do we do inventory and analysis?

Site inventory is the first step of the design process. It is a catalogue of what exists on the site. We analyze the site findings and determine if there are opportunities, constraints, and other aspects that need to be maintained or changed.

Bordentown History







Clara Barton 1821-1912

lara Barton was unlike most women of her time. Clara Barton decided marriage would contain her from what she wanted to accomplish in her life so she never married. Clara is a founder of the American Red Cross as well as starting the first public school house in Bordentown, NJ.

During a visit to Bordentown, NJ, Clara saw children gathered at street corners and was highly upset that these children were not given an education. So she opened the first free public school which was a oneroom school-house. Within two years, the numbers increased from six children to 600 with teachers teaching all over the town in homes.

William Frank Powell 1844-1921

William Frank Powell was a well-educated colored man. He graduated from The New York School of Pharmacy, and he joined the Naval Services in the 1860's. He later went to Lincoln University in oxford, PA. After graduation he moved to Virginia and started working at the Presbyterian Board of Home Mission for Freeman Schools, in Leesburg, Virginia. He worked there until he became a principal for the first school for colored children in Virginia. William Frank Powell later became the principal of the second all-Negro one-room school houses in Bordentown, NJ. After his time in Bordentown, NJ he became district principal for all the Negro schools in Camden, NJ.

William Frank Powell was an advocate for the education for the colored youth. He was offered several important political positions throughout his life, but turned down each one to remain in the classroom. William Frank Powell was also a Grand Master of the MW Prince Hall Grand Lodge of New Jersey in 1879-1880, which was founded by Prince Hall who lobbied tirelessly for education rights for black children and a back-to-Africa movement. Powell eventually accepted the position U.S. Charge d'affaires to Santo Domingo offered by President McKinley and U.S. Minister (his actual title was Envoy Extraordinary and Minister Plenipotentiary) to Haiti. Where he retired to his home in Camden, NJ.



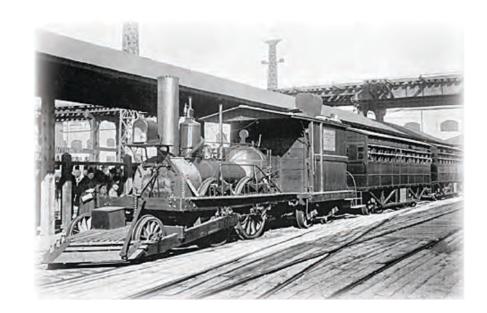
Abbott Farm Historical District

The Abbott Farm Historic District is a National Historic Landmark archeological site in New Jersey. It is the largest known Middle Woodland on the east coast. The district covers over 2,000 acres of marshes and bluffs in the New Jersey Area. There is evidence in this district that the Paleo-Indians also known as the earliest known settlers occupied between 500 BC and 500 AD.

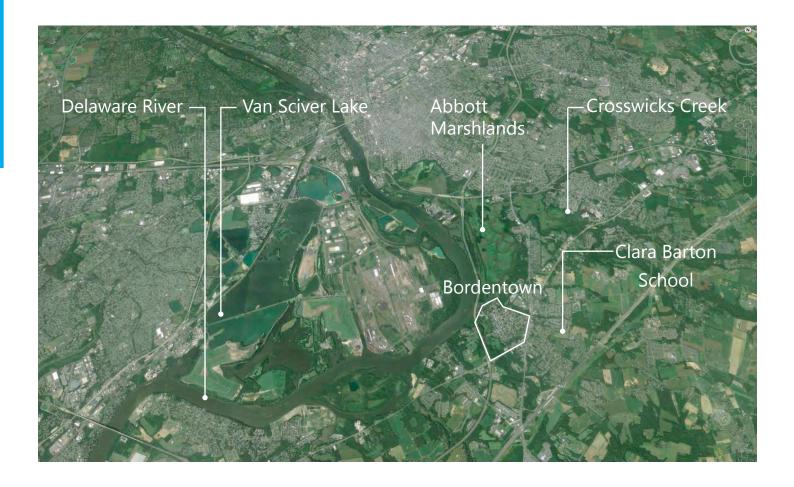
These people were hunter gatherers and moved with the seasons. The excavation on the site revealed a chain of villages, and supposedly marked the headquaters of the Unami division of the Lenni Lenape Indians. Later The Lenape Indians are known for migrating along the Delaware River. The Lenape Tribe practiced agricultural to a smaller scale. They also hunted and gathered as well as fished in many of the rivers and streams in the area.

The John Bull Train

The John Bull train was purchased by Col. Robert Stevens who went to England and bought the train. The train was shipped up the Delaware River and assembled in Bordentown, NJ by engineer Isaac Drips. For the first ride on the rails laid between White Hill and Bordentown. The locomotive was run by steam, and was the first railroad in the New Jersey State. The railroad traveled from Camden, NJ to Perth Amboy, NJ. The John Bull, is now on display at the Smithsonian Institute, is the oldest existing locomotive in the United States. September 15, 1981 the locomotive was operated in Washington D.C. on its 150th anniversary. The John Bull train is now known for the oldest operating locomotive in the world.



Bordentown Ecology



Bordentown Marsh

he Abbott Marshlands (also known as the Hamilton-Trenton-Bordentown Marsh), have a unique cultural history. Archeological excavations within the marshlands have found evidence of Native American inhabitants going back 13,000 years. The Marshlands also have a distinct ecological identity, encompassing critical habitat for several rare and endangered species. Due to their diversity, the wetlands are also as environmentally productive as a tropical rainforest.

Buttonbush (Cephalanthus occidentalis)

Rose mallow (Hibiscus moscheutos)

Blue flag (Iris verisicolor)



Elderberry (Sambucus canadensis)

Bordentown Ecoregions

Bordentown is located near the Bordentown Bluffs, an unusual high point in the New Jersey plain that overlooks Abbott Marsh and Crosswicks Creek.

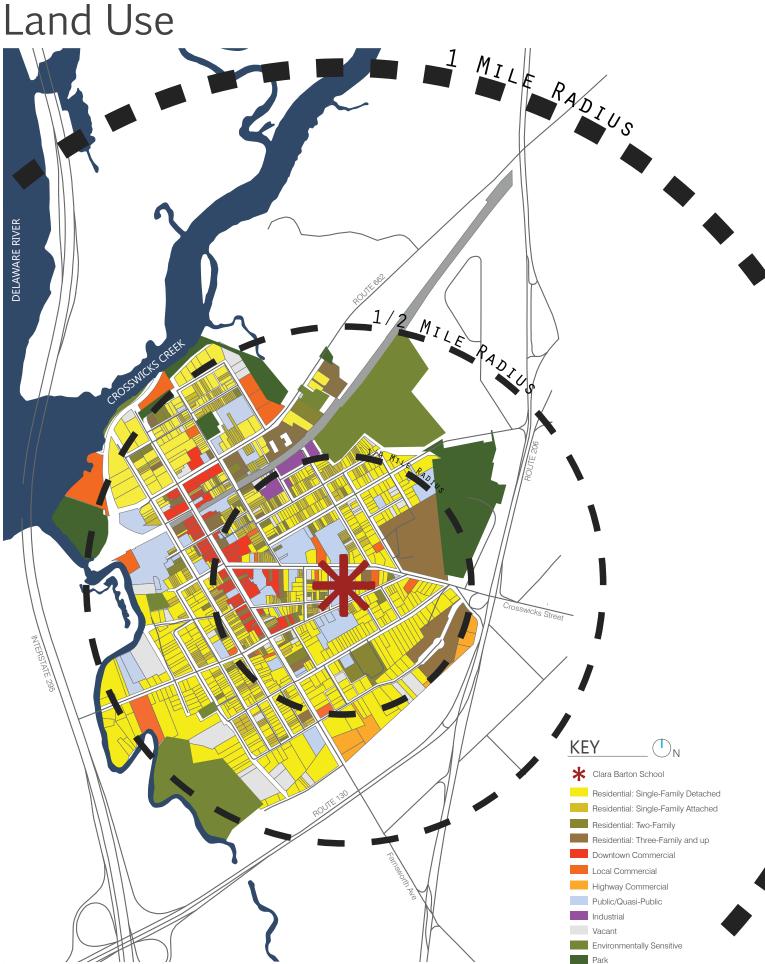
The Abbott Marshlands include the northernmost tidal freshwater wetland on the Delaware River and provide habitats for many species of birds, plants, mammals, amphibians and reptiles, including a number that are threatened or endangered. It is a unique urban habitat area that also provides nesting sites for many varieties of migratory birds

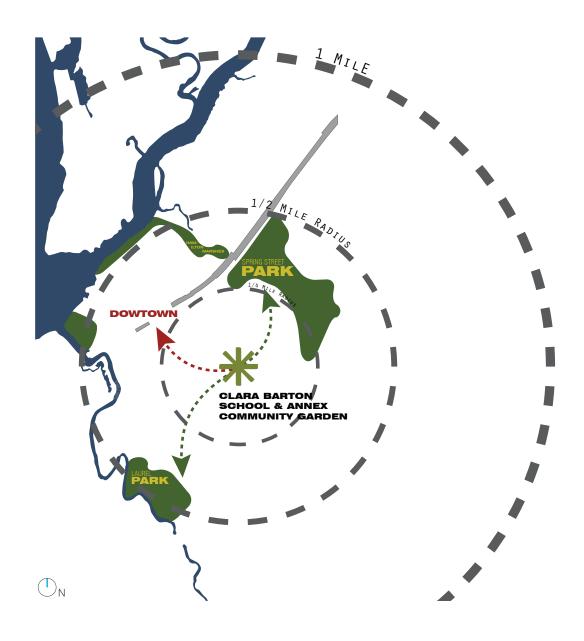
Ponds, creeks, the Delaware and Raritan Canal, and the Delaware River and van Sciver Lake, are all part of this diverse landscape. Also important to the diversity of the area is The Abbott Farm National Historic Landmark, which is the largest Middle Woodland (ca. 500 B.C. – 500 A.D.) village site in the costal Mid-Atlantic region.

Native Americans established settlements here because the diverse habitats provided a wide range of opportunities for hunting and fishing.

Analysis: Understanding these wetland ecosystems and their plant communities is essential to interpeting the unique character of the area. Drawing on this ecological diversity allows a wide range of choices in planting designs and educational applications.

Land Use



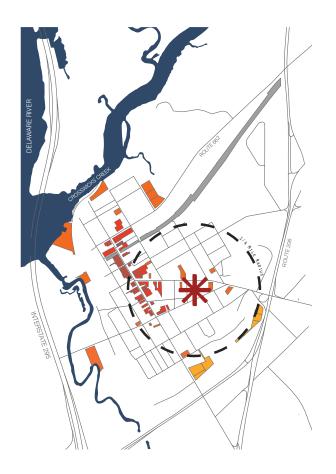


Bordentown Land Use

Clara Barton Elementary School (CBES) is located in a residential area with MacFarland Intermediate School Across Crosswick Street. This location is centrally located and provides a convenient location for community access during after school hours.

Connections

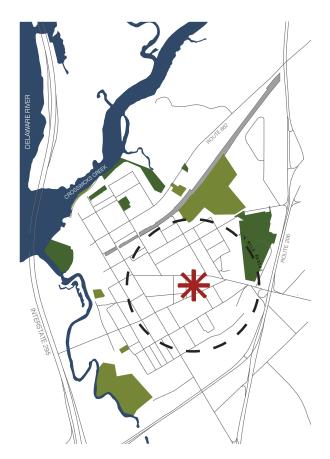
The Clara Barton School is 1/4 mile from Bordentown's downtown area. The close proximity makes it easily walkable between CBES and the garden annex and the local shops and businesses. CBES is also centrally located and within 1/4 - 1/2 mile vicinity from green spaces in Bordentown.



Commercial - Downtown

commercial zones bordentowns downtown, highway commercial, local commercial, and downtown commercial. The downtown district is the closest and most important district to our site. It is within walking distance of the school and proposed community garden, making it an ideal location.

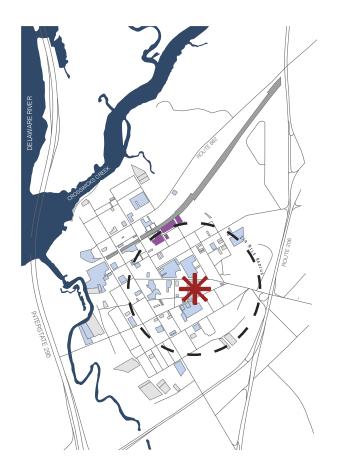




Parks - Green Space

The schools holds a central location to the entirety of the green space within the area, much of it lies within 1/4 mile of the site. This leaves a great opportunity for a walkable green space network through the town and surrounding areas.

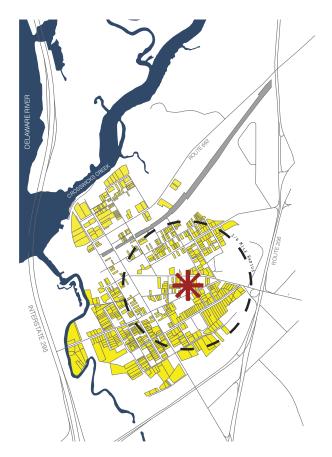




Public - Vacant - Industrial

The vacant land within Bordentown is not located within one area, but randomly scattered throughout Bordentown. These vacant lands provide sites for potential future green space and pedestrian linkages. A small number of industrial spaces, are located north west of the school.

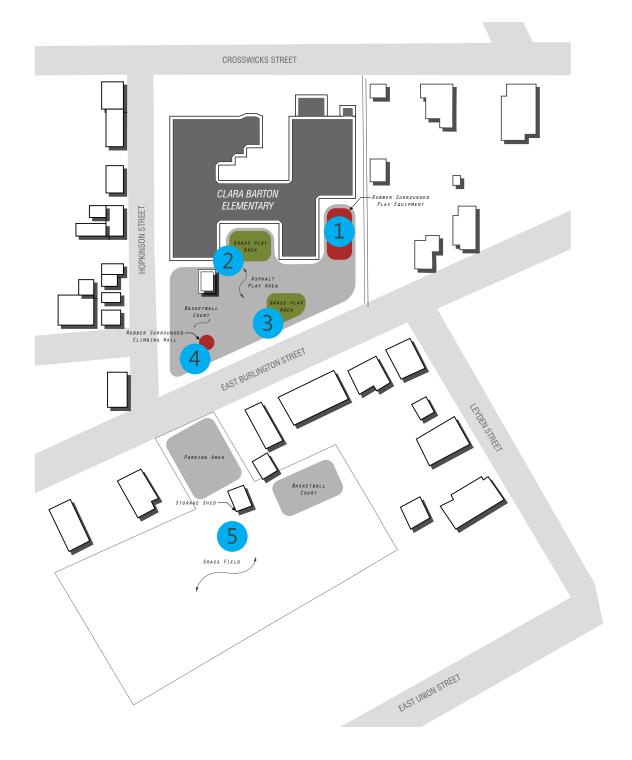




Residential

The residential districts represents the largest percentage of land use within Bordentown. This is comprised of single family detached and attached, as well as two and three family homes. The school is predominantly surrounded by single family detached residences.





Site Analysis

Asphalt paving is the dominate feature of the Clara Barton Elementary Schools schoolyard. Many of the features, such as the rail road tie retaining walls are in disrepair and need refurbishment. The existing play equipment however is good condition and should be reused. Within the annex property the basketball court is in disrepair and should be removed or refurbished.

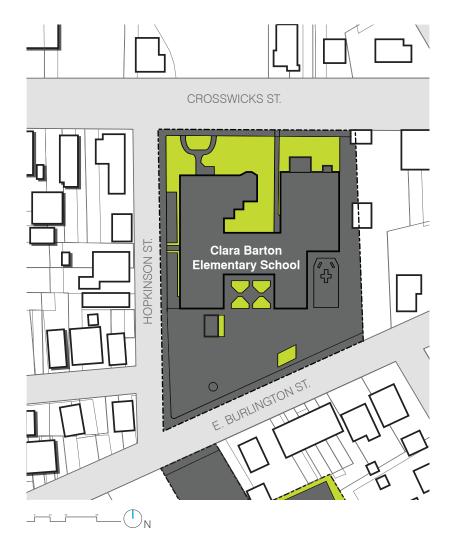


- The play structure is intended for smaller children, but is highly utilized after school hours by all age groups. Railroad ties that hold rubber surface in are in disrepair. Potential for improved seating, shade, and equipment layout.
- This small grassy space is home to creative play equipment that is underutilized by the students. It sits about one foot above grade and is held together by deteriorating rail road ties. Potential for improved green play area with shade trees.
- Lone ginkgo tree sits inside a crumbling rail road tie planter bed. The area is highly used by children playing in the dirt, and on the musical instruments. Due to the ultimate use of this area, the roots are being severely compacted.
- Rock wall play structure seems to be placed randomly and without thought, even though this is the case, the small rock wall is one of the most used features on the playground. Potential for moving it to a better suited location.
- The large adjacent annex property is currently occupied by a basketball court and baseball field that show no signs of use. This site has great potential for a community garden, and the fresh produce harvested could in turn be used by local restaurants.

Schoolyard Surface Material

Analysis of Schoolyard

The inventory and analysis of the schoolyard shows few pieces of play equipment and minimal green spaces. The majority of the site consists of asphalt. This contributes to the heat problem due to lack of shelter from the sun.



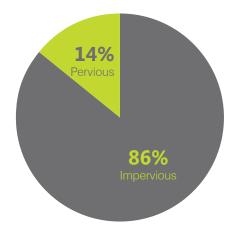
Opportunities/Constraints

There is an opportunity to remove paved areas and incorporate trees for shade and storm water infiltration. More green spaces would make that space feel cooler in the summer and more comfortable to be in. It also provides an opportunity to teach children about plants and the role they play in the real world.

Removing the asphalt is costly. Therefore the design should take this into consideration. The rusty fence surrounding the schoolyard is an eye sore and needs painted and maintained.

Surface Material

Pervious Vs Impervious



37%-Building Footprint 39%-Pavement 10%-Sidewalk

86%-Impervious Surface

13%-Green Space 1%-Rubber Mat 14% Pervious Surface

86%-Impervious Surface 14% Pervious Surface 100% Total Surface Area

Annex Surface Material



Analysis of Annex

The annex consists of primarily lawn.lt consosts of a T-ball field and basketball court, both in severe disrepair. There is great potential to incorporate tree plantings and removal of paved surfaces as well as the addition of more play equipment with both natural and man made play equipment. The annex is a prime location for a community garden and park setting. The ball field can be easily refurbished.

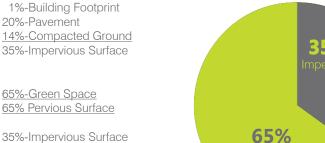
There is an opportunity to incorporate a

community garden and tree plantings in the open field. This would provide much needed shade. The T-ball field and basketball court can both be refurbished and reused.

Opportunities/Constraints

The compacted soil of the abandoned tire park and underlying fabric may be a problem. Soil testing and modification, or removal of material may be necessary.

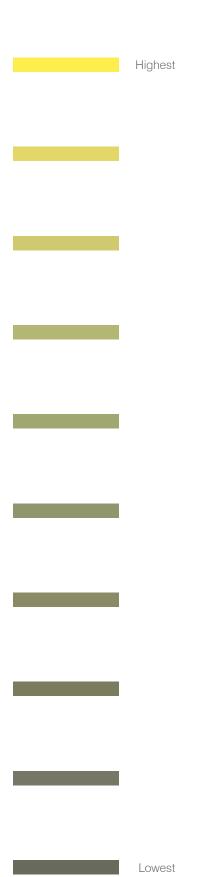
Surface Material Pervious Vs Impervious



35%-Impervious Surface 65% Pervious Surface 100% Total Surface Area

Topography & Drainage



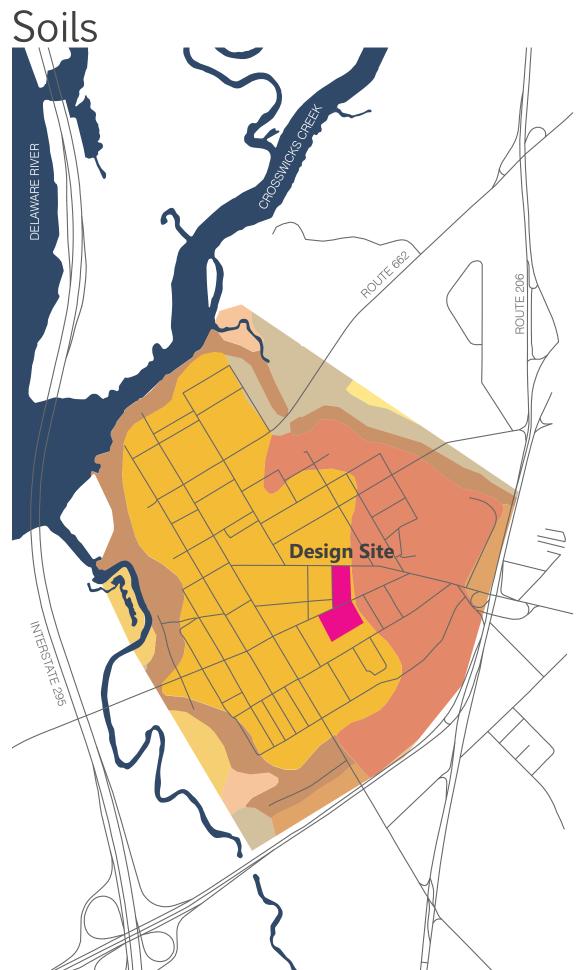


Clara Barton

Clara Barton School has positive drainage away from the building. A problem area is found at the lowest point at the junction between East Burlington Street and Hopkinson Street. Although the main sewer inlets are located here, runoff watercollects at this point. Interception of this water flow is necessary and will further enhance and promote the goal of an ecological schoolyard.

Annex

The site is predominantly flat which offers a blank canvas for design. Currently no drainage issues are apparant at this site, however, the design of stormwater management facilities would enhance the site and promote sustainability.



SaeKA Sassafras fine sandy loam, clayey substratum, 0 to 2 percent slopes

FrmKB
Freehold fine
sandy loam, clayey
substratum, 2 to 5
percent slopes

KeoC Keyport loam, 5 to 10 percent slopes

KeoD Keyport loam, 10 to 15 percent slopes

URCLAB Urban land, clayey substratum, 0 to 8 percent slopes

FmhAt Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded

MamnAv Mannington-Nanticoke complex, 0 to 1 percent slopes, very frequently flooded

Soil Profile

Sassafras Fine Sandy Loam: Fertile soil with near equal proportions of sand, silt and clay. Sandy loam holds moisture, but also drains well, allowing aeration of plant roots. As a soil with few limitations, a wide range of plant and vegetable choices are available.

Vegetation Crosswicks St. Street trees surrounding Shrub arrangements site (photo #1) Dogwood tree on site (photo #2) Outdoor classroom and garden (photo #5) School faculty parking St Clara Barton Elementary Hopkinson K-1 Students play area (photo #6) Raised grass beds (photo #3) Chiller building Ginkgo tree on site (photo #7) Children's climbing E. Burlington wall structure Pin oak tree on site (photo #4) Basketball court in annex area of site (photo #8) Annex parking lot Previously a tire playground; matting weed control border still exists Baseball field **Analysis**

There is a lack of vegetation on the site. Most of the vegetation can be found around the edge of the property lines. Much of the vegetation seen is offsite, some of which is not in great condition. Vegetative screening is an option for shielding any unpleasant views surrounding the school. Adding new plants opens up an opportunity to create new spaces for the school and neighborhood.

There was much opportunity to add vegetation without having to worry about taking down multiple existing plants. The constraints

consist of the cost of adding a lot of the vegetation as well as providing shade in the schoolyard while conforming to the spacing guidelines between playground equipment.

Little shade was found throughout the schoolyard. Even the smaller microclimate areas got a substantial amount of sun. With the ground plane being a sea of blacktop along with almost no trees, the schoolyard was an uncomfortable place for the children.

Existing Conditions



1. Memorial and planting bed at main entrance.



4. Oak tree with no planter. Uncontained sandy debris surrounds trunk base.



7. Ginkgo tree in raised bed. Bed contains small play equipment and sandy area.



2. Dogwood tree at the corner of the school building.



5. Intimate outdoor classroom space with small garden.



8. Court surface is poor and cracked surrounded by overgrown vegetation.



3. Raised grass beds on site; some containing small play equipment.



6. K-1 play area surrounded by school and off-site trees.



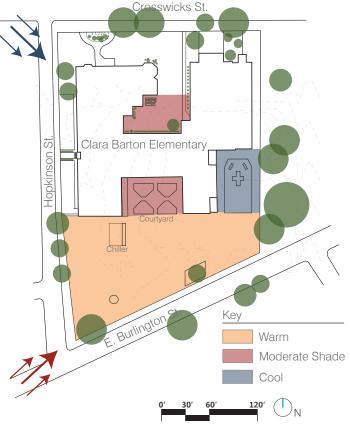
9. Lack of vegetation results in views of surrounding neighborhood.

Schoolyard Microclimates

The area around the school has three microclimate categories: warm, varying, and cool where the students gather and spend time throughout the day. Generally, a large part of the schoolyard has no shade throughout the year (see solar/shade diagrams). There is an opportunity to add new vegetation to help cool down and shade the area. In the "moderate shade" areas, shade is provided at times from the shadow cast by the building. These areas are also protected from the northwesterly winter winds. For the "cool" area, it tends to be somewhat shady because it is an enclosed area protected by the building on two sides and trees on the east side.

The courtyard is an appropriate place for an outdoor classroom and/ or play area because of its close proximity to the school building and because of it being an enclosed space.

The annex portion of the site, just south of E. Burlington Street was not broken up into microclimates since it was essentially an open field with no real spaces.



Solar/Shade Seasonal Diagram

January Crosswicks St. Clara Barton Elementary



3pm-4pm





Inventory

The shade diagrams above depict the solar orientation at Clara Barton Elementary School during the four seasons. It is a general observation to see that though there is shade provided by the building and trees, at certain times of the day, it is very minimal.

July

October

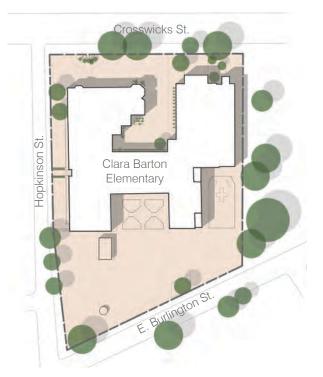






3pm-4pm



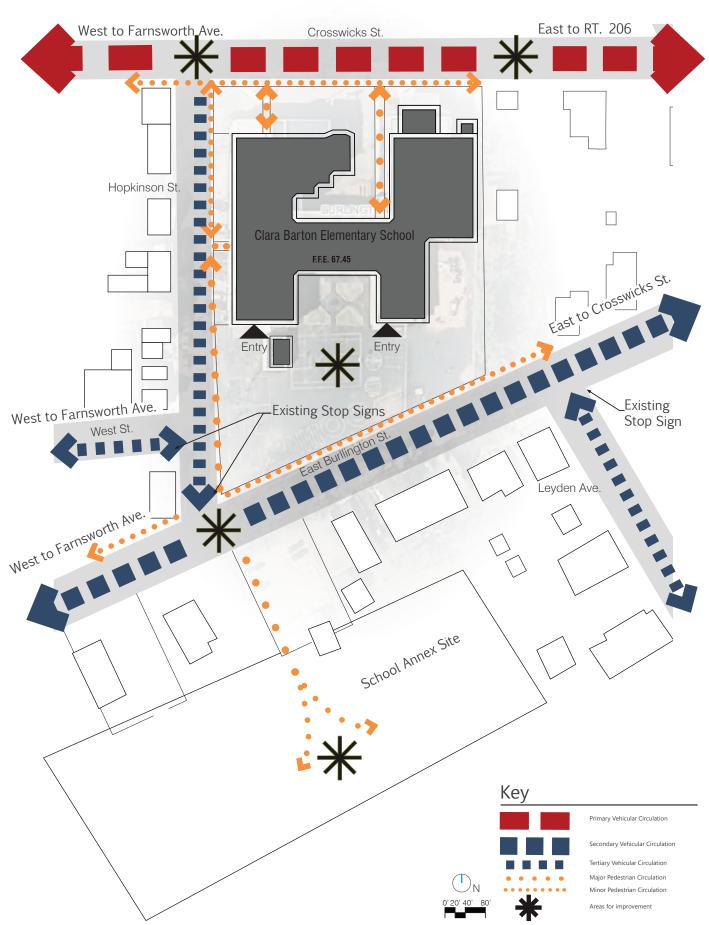


Analysis

The majority of the schoolyard remains exposed and, at times, very warm. An opportunity for the project can be to design and add vegetation to the center of the schoolyard and have paved areas (if desired) along the somewhat shady fence line.



Pedestrian & Vehicular Circulation



Inventory

The N.J.D.O.T. conducted a study on Crosswicks St in 2012 on the traffic flow between Hopkinson St and Spring St. The results of the study showed that, at the peak A.M. hour, which is 7-8am, there are 268 vehicles that pass through the school zone. The results also showed that between 2-3 pm the volume of traffic reached 182 vehicles.

Due to the high volume on Crosswicks Street, vehicles use East Burlington Street as a shortcut between Crosswicks Street and Farnsworth Avenue, which is to the west. As a result, the volume is increased on this street which is just south of the playground. Currently, no stop signs or traffic calming devices exist on this street to slow down traffic.

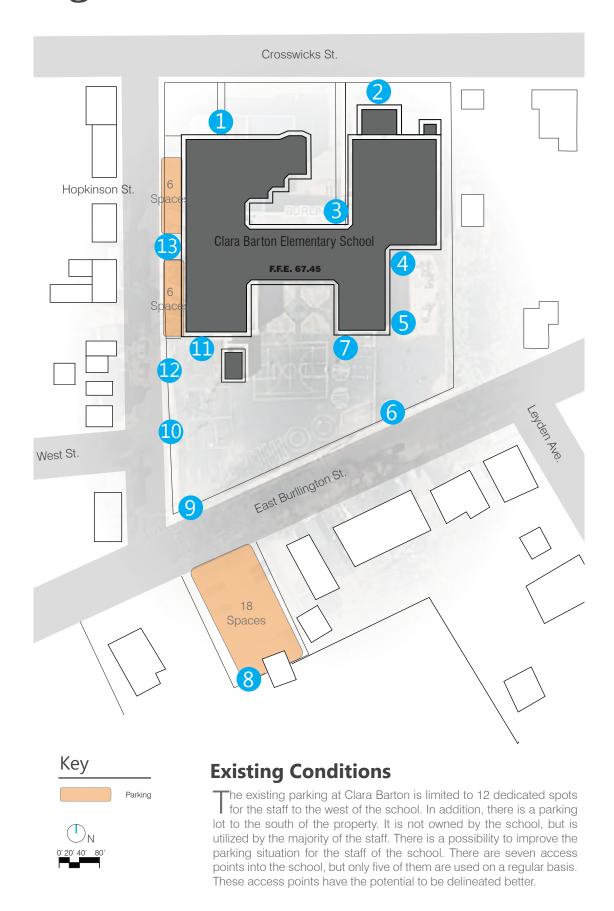
Analysis

Overall, vehicular circulation around the site could be improved to make the school zone a safer environment.

Crosswicks Street needs traffic calming devices to slow traffic down. This could be accomplished through curb bump-outs, traffic signs, and traffic lights. The intersection of Hopkinson Street and East Burlington Street needs traffic calming devices similar to those on Crosswicks Street including stop signs. Traffic along Hopkinson Street could be slowed down with speed bumps.

The pedestrian circulation on the perimeter of the site seems to work fine. Currently, within the playground, there is no organized circulation. There is a potential to better facilitate pedestrian movement within the site, as well as make a connection to the annex site. The annex site, in its current state, also has no organized circulation. There is a great potential to create programmed use and circulation within the annex by creating a park design.

Parking & Access





Main Entrance - Utilized by students and visitors. Potential to be highlighted with landscape treatment.



Gym Entrance - this entrance has three sets of doors.



Front Entrance - Utilized by students and faculty. A seating and garden area is adjacent to the entry.

Potential for better connection.

6



ADA Ramp - The only ramp in the playground area. Potential for improvement.



Exit and Entrance for Kindergarten Recess - Potential for landscape treatment.



Kindergarten Entrance - Potential for improvement.



Exit and Entrance for 2nd and 3rd Grade Recess - Spill out onto asphalt. Potential for landscape treatment.



Main Entrance into Annex - Potential for landscape treatment.



Southwestern Access - Potential for connection with open space.



Emergency Vehicle Access - Potential for new treatment.



Exit and entrance for 2nd and 3rd grade recess - Spills out onto asphalt. Potential for landscape treatment.



Western access - Potential for new treatment.



Main Entrance for Faculty and Staff - Potential for landscape elements.

Views & Aspects: Schoolyard



Front & Side

LEFT: Front entrance of the Clara Barton Elementary School.





Green Areas

LEFT: In the background is the existing green courtyard and in the foreground is another existing compacted area with drums.

RIGHT: Existing green courtyard.







Play Equipment

Basketball Court

Chiller Building Building entrance behind



K- 1st grade Playground

The existing K-1st playground area is situated next to the abandon barn. The condition of the playground is fair. Renovating or replacing the playground will enhance the overall appearance of the schoolyard.

The Schoolyard



Green Courtyard

Building Entrance

K-1st grade Playground

Views & Aspects: Annex





Existing Features

LEFT: Current teacher's parking lot.

RIGHT: Abandoned basketball court in very poor condition.



Existing Features

LEFT: T-ball field is barely usable in its current state.



RIGHT: Current seating available in the Annex.



Neighboring Properties

Lawn



Annex Entrance

The current entrance to the Annex is through a parking lot which is very unattractive and blocks view to the Annex property. Designing an appropriate entrance would provide a more visible and inviting entrance.

The Annex

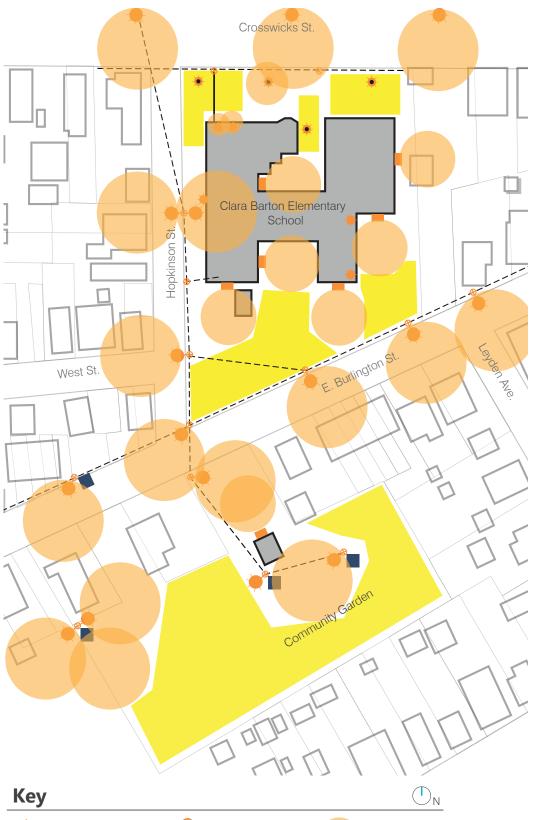


T- Ball Field beyond

Garage

Basketball Court

Lighting



Street Light w/

Solar Panel

Street Light

Light Projected

Need for Light

Inventory

The school is lit primarily by street and flood lights. Presently, there are only four lamp posts on the north side of the school. The Annex has three street lights and a single flood light in the parking lot.

Analysis

The lighting of site does not accentuate the landscape in anyway. Three of the four lamp posts on the north side of the school do not work and need to be repaired. The NE corner of the building is the darkest area of the school grounds. The SE, SW, and central area of the playground receives little light. The Annex is dark and uncomfortable to be at after sunset. During the site visit one solar light came on for five minutes and shut off, the other one was not working. The only light provided at the Annex is from the two street lights in the SW corner.

Opportunities and Constraints

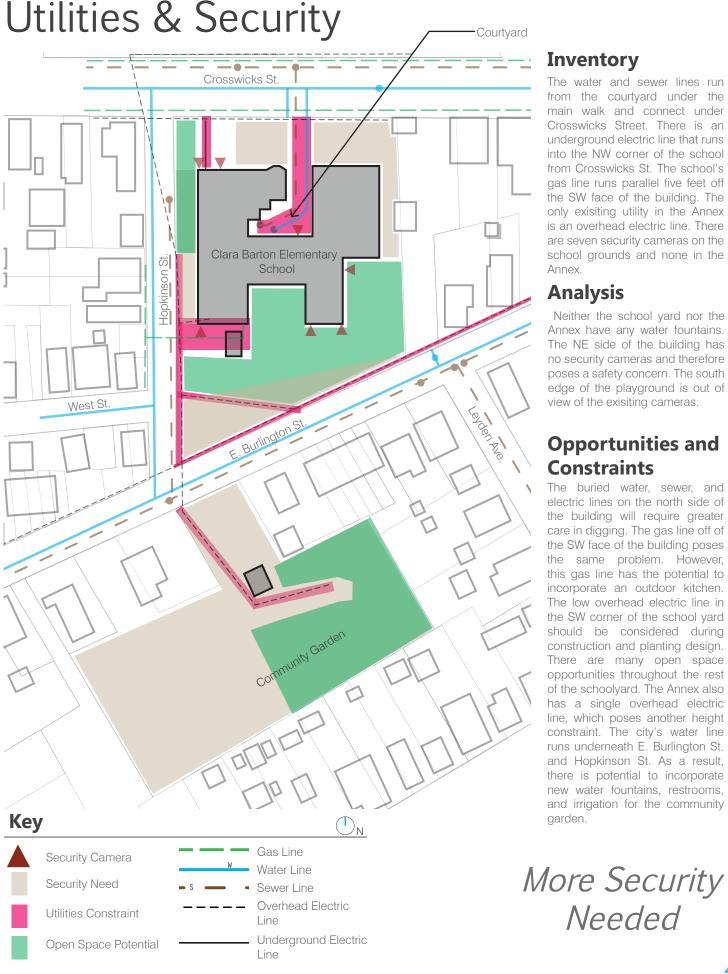
The majority of the schoolyard has very little light. The center of it needs more light. There is potential to add more lighting throughout schoolyard. In the Annex, there is potential for additional lighting, e.g. the proposed community garden and T-ball Field. After additional site lighting has been installed, the community park will have the opportunity to be used after sunset.

More Light Needed

Hanging Light

Post Light

Flood Light



Site Furnishings



Active

-Play Structures, Ball Courts, and Fields



Gardening

-Compost Areas, Vegetable Garden



Passive

-Play Structures, Benches, Bleachers



Utility

-Garbage Can, Waste Disposal

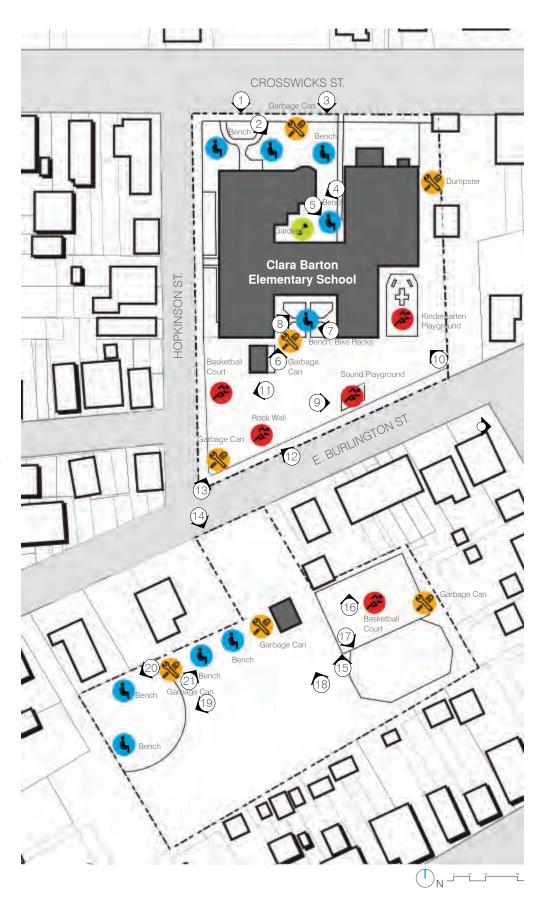


The existing furnishings consist of small playground structures in the schoolyard, run down sports fields and seating in the annex are in poor condition.

Opportunities/ Constraints

There is an opportunity to incorporate natural elements combined with plantings and trees to add both shade and aesthetics to the annex site. A community garden would be a desirable addition. The ball field is in fair condition, it has the potential to be restored and enjoyed by the community.

The most prominent constraint is the vast amounts of paving and compacted surfaces. Removal of or modification of these problem areas would allow for an increase in infiltration and planting of future shade trees throughout the site. This would make both areas more enjoyable to be in.





Bordentown Memorial



Existing Seating



Courtyard and Secondary Entrance



Outdoor Classroom Area



Custom Brick Patio



Boiler Room Access Ramp



Landscape Beds with Seat Wall



Timber Seating Wall



Sound Playground



Younger Children's Playground



Small Scale Basketball Court



Rock Climbing Wall



William F. Powell Memorial



Second School Memorial



Heavily Overgrown Fence



Basketball Court



Remnants of Tire Park



Grounds Maintenance Garage



T-Ball Field



T-Ball Benches and Fence



Wooden Bleacher

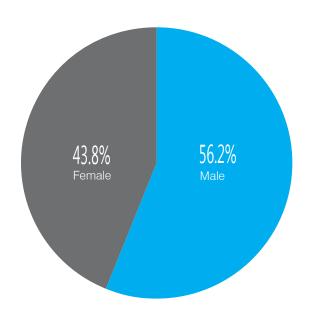
Demographics

Analysis

Bordentown enjoys a relatively low crime rate. Additional security measures are not necessary at this time.

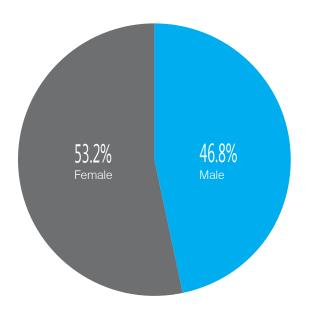
The student body primarily walks or rides a bicycle to school. Considerations should be made in regard to schoolyard access and bicycle security. A significant portion of the student body is special needs. Any rehabilitation of the schoolyard and additional play equipment should address this in both materials and accessibility to site features.

The desire to incorporate a school and community garden into a design can serve many benefits which encompasses everything from education, basic nutrition and supplementation of school meal programs. Learning how to cultivate and prepare a healthier, more nutritious diet is advantageous for children who will grow into healthier adults.

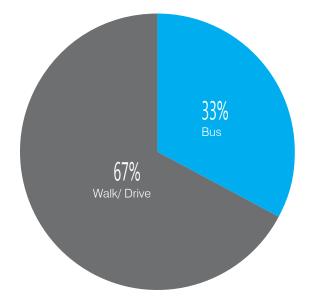


Clara Barton Population

City and school gender populations are closley reflected in percentage. The adult male population is higher than the female. This figure is reversed among the population of children.



Bordentown Population



Transportation to and From School

Of the 244 students enrolled at Clara Barton, the majority would benefit from a better connection to the surrounding area. There is currently no need for an expansion of the bus drop-off area in front of the school.

School Meals



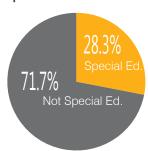
Presently, there is an opportunity for a community garden to supplement unmet school lunch needs.

Median Income



The median household income in Bordentown is slightly below the State average.

Special Education

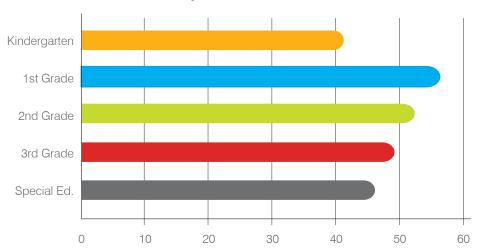


Over a quarter of the students participate in some form of Special Education program.

Teacher/Student Ratio



Student Enrollment By Grade



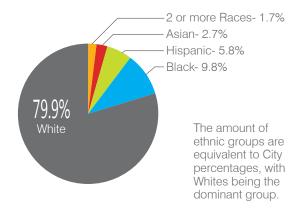
Number of Students

There are a similar amount of students in each grade, with just over a quarter of the students of Clara Barton participating in some form of Special Education program.

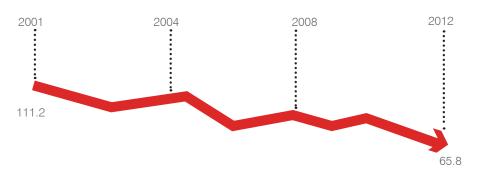
Ethnic Diversity- Clara Barton

2 or more Races- 1.2% Asian- 4.1% Hispanic- 6.6% Black- 10.2% 77.9% White

Ethnic Diversity- Bordentown

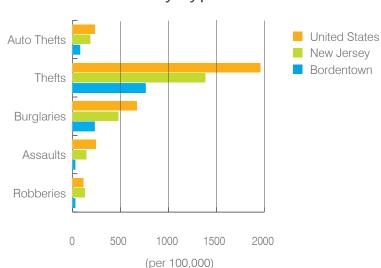


Bordentown Crime Rate: 2001-2012



There has been an overall decline in the crime rate in Bordentown from 2001-2012. Current trends indicate crime should continue to drop.

Crime Rate By Type - 2012



The crime rate in Bordentown is less than New Jersey in every catagory and significantly safer than the U.S. overall. As a result, less measures may be necessary to create a safe and secure area.

MASTER PLANS

What is design?

Design is the transformation of an idea into a drawing. Good design begins with consideration of user needs, site conditions, and life safety issues. The designer formulates and frames the resulting design with a healthy mixture of creativity and insight.

Nate Birkel



Goal

Create a new site design for an ecological schoolyard that promotes sustainability, while incorporating learning opportunities into the curriculum.

Objectives

- Implement plantings throughout schoolyard to make a softer, more appealing setting.
- Remove a significant amount of asphalt to provide a greener schoolyard.
- Provide natural play areas.
- Recycle and reuse as much material as possible to use sustainable building practices.
- Incorporate areas and materials that will benefit the environment throughout the schoolyard.
- Providé interpretive signage about areas and objects in the schoolyard that benefit the environment.
- Integrate an outdoor classroom to give children a hands on learning experience.

Project Outline

The main concept behind this design is to provide children the opportunity to play in nature. Most playgrounds today are just asphalt, with a few play structures, as is the case with Clara Barton. This design attempts to break this trend and incorporate nature into the schoolyard. This is accomplished by using natural play structures like willow domes and tunnels and removing a significant amount of asphalt providing more permeable surface. The new play system is a set of synthetic boulders, linked together by climbing ropes and nets. Various teaching gardens were included to increase biodiversity while softening the playground with plantings. For the Annex design, the park was divided into four separate spaces: Garden Space, Community Green and Recreational Space and parking.

Master Plan



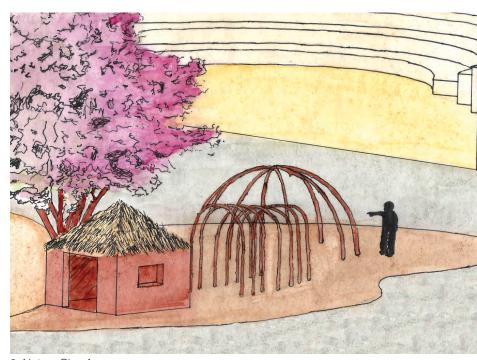
Perspectives



1. Northeast Perspective of Schoolyard

Key





2. Nature Play Area



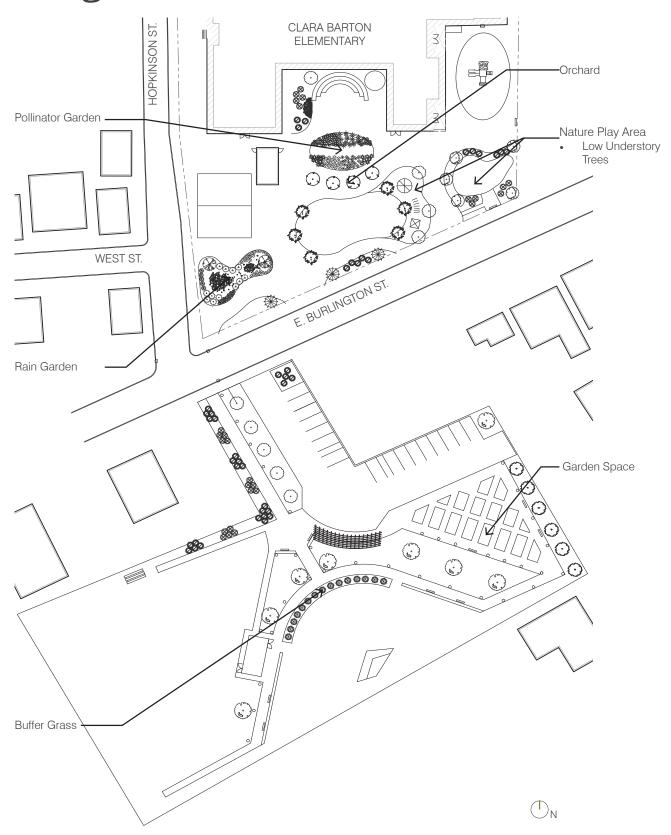
3. Southwest Perspective of Annex Park





4. Drop-Off at Community Garden

Planting Plan



Planting Concept

- The planting plan provides shade canopies scaled for children. Low understory trees were incorporated to give the students a sense of enclosure
- A wide collection of plants was used to attract pollinators as well as to increase biodiversity in the educational gardens





Firecracker Plant



Summer Sweet Clethra



Black Eyed Susan





Cardinal Flower





St. John's Wort



Coral Bark Maple



Hydrangea



Flowering Onion



Sweet Lupine



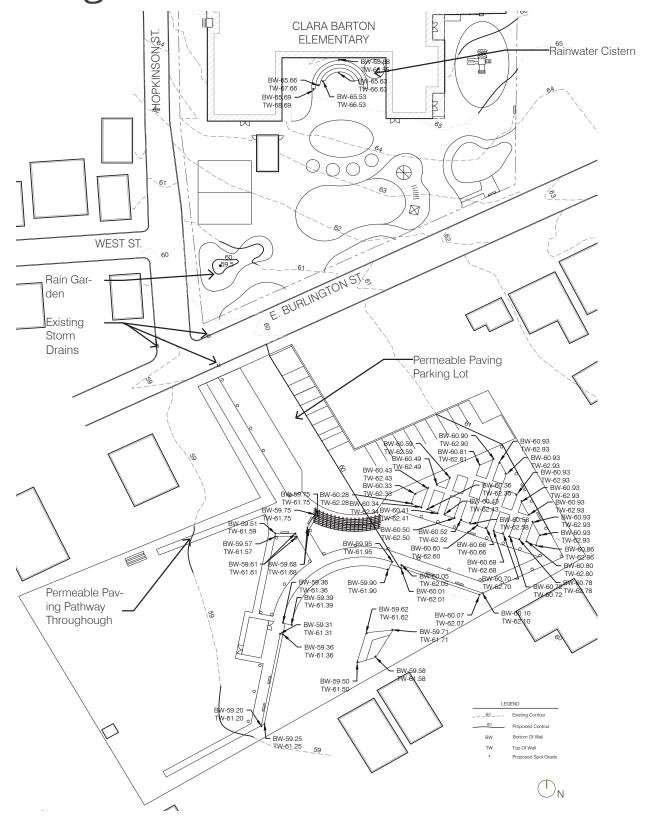
Lily Turf



Foam Flower

LATIN NAME	COMMON NAME	SYMBOL	HEIGHT	SPREAD	QUANTITY	COST
	TREES	75%				
Cercis canadensis	CHINESE REDBUD	O .	15'-20'	10'-15'	6	\$540
Malus 'Fugi'	'FUJI' APPLE	\odot	10'-15'	8'-10'	4	\$100
Lagerstromia fauriei	JAPANESE CRAPE MYRTLE	0	8'-10'	5'-10'	9	\$516
Acer acontifolium	SOUTHERN SUGAR MAPLE	()	8'-10'	5'-10'	5	\$290
Acer palmatum 'Sangokaku'	CORAL BARK JAPANESE MAPLE	(<u>;</u>)	15'-25'	15'-20'	8	\$848
Hamamalis chinensis	WITCH HAZEL	***	10'-15'	5'-10'	2	\$30
Juniperus scopulorum 'Rependens'	ROCKY MOUNTAIN JUNIPER	*	10'-15'	10'-15'	3	\$720
Pinus strobus 'Pendula'	PENDULOUS WHITE PINE (10'-15'	10'-15'	6	\$282
	SHRUBS					
Rhododendron 'Hampton Beauty'	'HAMPTON BEAUTY' AZALEA	0	5'-8'	3'-5'	36	\$956
Hydrangea macrophylla	HYDRANGEA	8	2'-5'	3'-5'	26	\$1170
Itea virginica	VIRGINIA SWEETSPIRE	©	4'-5'	3'-5'	7	\$147
Leucothoe racemosa	SWAMP SWEETBELLS	0	2'-5'	4'-5'	5	\$115
	GRASSES					
Cortaderia pumila	DWARF PAMPAS GRASS	0	3'-5'	3'-5'	15	\$360
Carex flagellifera 'Toffee Twist'	TOFFEE TWIST SEDGE	8	1'-2'	2'-3'	5	\$50
	PERENNIALS		•	•		
Allium giganteum FLOWERING ONION		*	2'-5'	1'-2'	13	\$221
Cuphea ignia	FIRECRACKER PLANT	*	2'-5'	2'-3'	16	\$192
Ipomopsis rubra	STANDING CYPRESS		2'-5'	2'-3'	16	\$32
Abelia x grandifolia 'Canyon Creek'	CANYON CREEK ABELIA	0	2'-5'	2'-3'	19	\$190
Begonia 'Angel Wing'	ANGEL WING BEGONIA	•	1'-2'	1'-2'	13	\$65
Lupinus mutabilis SWEET LUPINE		*	2'-5'	1'-2'	21	\$184
Clethra alnifolia SUMMER SWEET CLETHRA		9	2'-5'	2'-3'	32	\$160
Rudbeckia hirta BLACK EYED SUSAN		•	1'-2'	1'-2'	50	\$197
Lobelia cardinalis CARDINAL FLOWER		٠	2'-5'	1'-2'	46	\$137
Hypericum calycinum ST. JOHNSWORT		•	1'-2'	2'-3'	86	\$258
Lirope spicata LILY TURF		•	1'-2'	1'-2'	111	\$555
Tiarella cordifolia	FOAM FLOWER	•	6"-1'	2'-3'	88	\$259
					TOTAL	\$8554

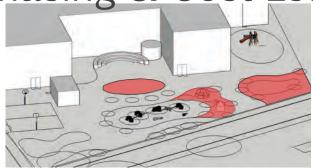
Grading Plan



Grading Concept

- Schoolyard: A rain garden was incorporated in the southeast corner of the school to collect stormwater. Annex: A pervious parking lot was integrated reducing stormwater runoff.
- Minimal grading was imposed.

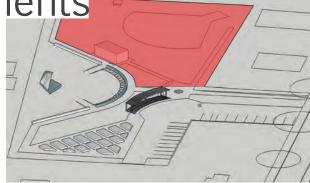
Phasing & Cost Estiments



- Asphalt Removal: \$64,000 Loose Rubber Mulch: \$6,500
- Mulch: \$225
- Natural Play Equipment: \$200
- Bench: \$750
- Vegetation: \$1,400

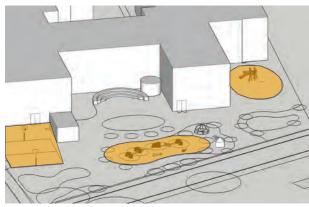
Total: ~\$73,075

PHASE ONE



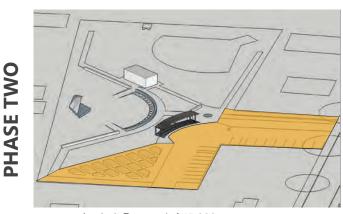
- Re-sod Infield: \$500
- Permeable Paving: \$6,000
- Proposed Building: \$56,000 Bleachers: \$20,000
- Lights: \$2,000
- Vegetation: \$1,000

Total: ~\$85,500



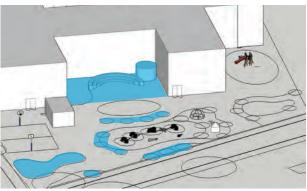
- Asphalt Removal: \$42,000
- Poured in Place Rubber: \$45,000
- New Play System: \$75,000 Basketball Court: \$200
- Vegetation: \$500

Total: ~\$162,700



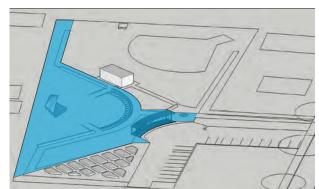
- Asphalt Removal: \$45,000
- Porous Asphalt: \$130,000 Permeable Paving: \$14,500
- Mulch: \$3.500
- Lights: \$4,000 Benches: \$2,000
- Vegetation: \$250

Total: ~\$199,250



- Asphalt Removal: \$30,500
- Ampitheatre:\$39,000
- Mulch: \$500
- Rain Cistern: \$500
- Rain Garden: \$18,000
- Vegetation: \$3,200

PHASE THREE



- Permeable Paving: \$96,250
- Stage: \$15,000 Walls: \$12,000
- Pergola: \$44,000
- Lights: \$2,050
- Benches: \$2,000
- Vegetation: \$3,500

Total: ~\$174,800

TOTAL PROJECT COST: ~\$787,025

The phasing plan focuses on creating an immediate impact with the school and community. By focusing on the smaller aspects first, the community can get involved and help bring awareness to the renovation. Once the community sees the benefits of these small additions, the project will gain support and see progress towrards its completion.

Total: ~\$91,700

Zoe Boothe-Jarrett



Goals

Design a sustainable, interactive schoolyard focused around interactive play, and neighborhood engagement for children.

Objectives

- Increase the amount of green space within the school yard.
- Create outdoor learning, and creative play spaces.
- Add shade with trees and structures.
- Include Best Management Practices.
- Create educational and directional signage to facilitate community connections.

Design Concept

he incorporation of nature into a learning environment can be a priceless addition to a child's life. This design incorporates that concept while also integrating active and imaginative play spaces. Within the adjacent annex property, similar goals are maintained. Incorporated are a community garden, a wetland area, and t-ball field. The creation of a sustainable school yard and annex property for the children of Clara Barton Elementary school and community will ultimately inspire the community to become a more intellectually diverse group that will carry that knowledge with them for the rest of their lives.

The plan of the proposed design meets the goals and objectives that were set for the school yard and annex sites. This includes space for educational, active play, and leisure activities within both sites. Items such as the existing t-ball field and play set were kept as they fit well within the proposed design. Included were multiple features focused on stormwater management such as a wetland and a cistern which many will use water from within the community garden. The community garden, the focus of the annex space, includes a composting facility, and tool shed. Overall the intent was to create a well designed and interactive space that will be used by the community.

Master Plan

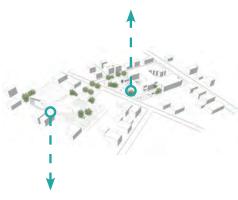


Perspectives



Above

View of the school yard looking north from the boardwalk within the educational area.



Below

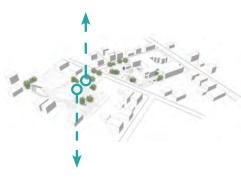
Looking east at the community garden, shade structures, and lawn space.





Above

Showing the entrance to the community garden area in the fall. Notice the shade structures and raised planting areas.

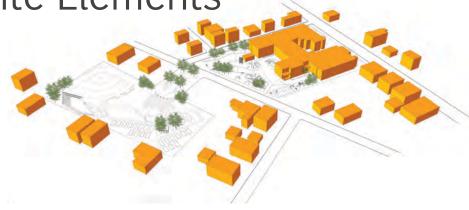


Below

A night scene from within the annex showing some potential uses for the open space.



Site Elements



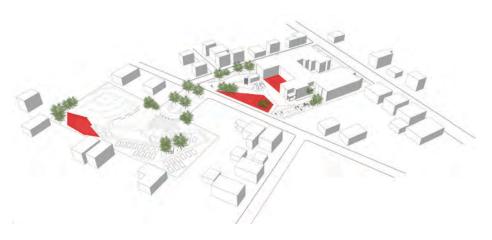
BUILT STRUCTURES



GREEN SPACE



IMPERVIOUS SURFACES



EDUCATIONAL SPACES



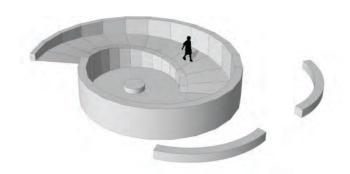


WATER FEATURES

Site Improvements

The proposed uses are in contrast to the current schoolyard and annex uses. The proposed plan focuses on green infrastructure and dramatically increased the existing green space from 10% to 45%.

Site Elements **LEARN**



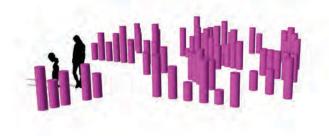
TOOL SHED



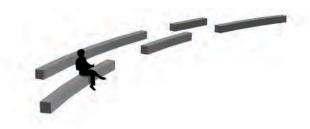
GROW



MAZE



SEATING



SHADE



TOWER



Key Elements

Many of the main elements of the design can be seen here in their true form. Structures are shown in orange, the seating in grey, the play areas in purple, and the gardens in green. All of these elements were designed to enhance the design and create interesting spacing for play and interaction.

Phasing & Cost Estimate



PROPOSED:

-Vegetation

-Raised beds -Pump and cistern -Rain garden -Basketball court -Relocate play structures

COST: 67,100 - 87,000

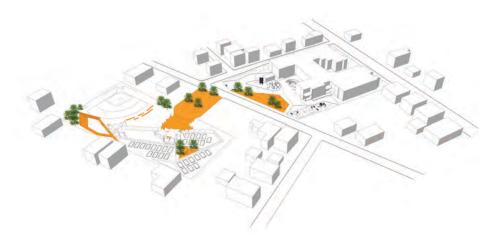
MATERIALS- 16,000 - 26,000 LABOR- 44,000-54,000 VEGETATION- 1100 DESIGN- 6000



PROPOSED:

-Rope tunnel tower Log maze -Rain garden -Paths and plaza -Shade structures -Vegetation -Classroom

COST: 152,000 - 202,000 MATERIALS- 48,000 - 68,000 LABOR- 97,000 - 127,000 VEGETATION- 1300 DESIGN- 6000



PROPOSED:

-Educational garden -Boardwalks -Shed -Parking lot re-design -Garden entrance -Vegetation

COST: 259,000 - 299,000

MATERIALS- 110,000 - 130,000 LABOR- 140,000 - 160,000 VEGETATION- 2900 DESIGN- 6000

Phasing

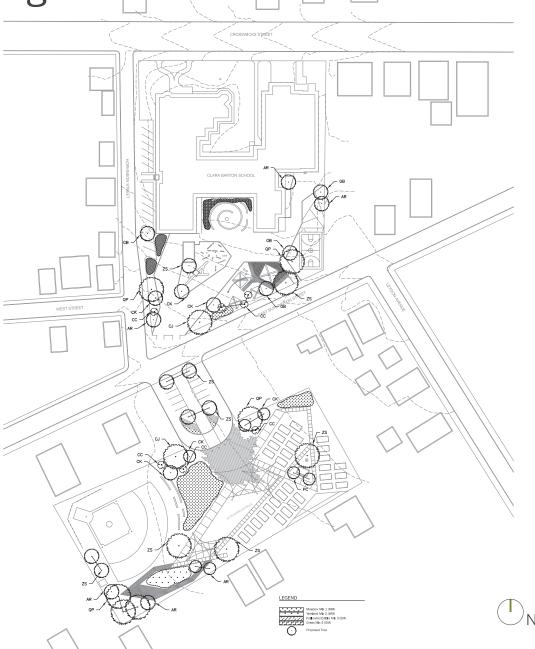
Proposed are 3 phase stages, they were based upon cost and spaces that draw the most people. Beginning with the most usable, cost efficient, and interactive spaces.



COST 478,300 - 588,300

MATERIALS- 174,000-224,000 LABOR- 281,000 - 341,000 VEGETATION- 5300 DESIGN- 18,000

Planting Plan



Planting Concept

Planting was informed by the primary usage of the space. Significant attention of the space. Significant attention was paid to the use of native plants, as well as trees for areas that require shade. A variety of plantings were introduced, that created meadows, wetlands, edible landscapes, and canopy trees.

			TREES				
AR	T	ACER RUBRUM	RED MAPLE	2" CAL.	B&B	FULL, HIGH BRANCHED	
CJ	T	CERCIDIPHYLLUM JAPONICUM	KATSURATREE	10' HT.	B&B	FULL	
CC	T	CERCIS CANADENSIS	EASTERN REDBUD	10' HT.	B&B	FULL, MULTISTEM	
CK	T	CORNUS KOUSA	KOUSA (JAPANESE) DOGWOOD	8" HT.	B&B	FULL, TREE FORM	
GB	T	GINKGO BILOBA	GINKGO	8" HT.			
PCE	T	PRUNUS CERASIFERA	CHERRY PLUM	8" HT.			
QPH	T	QUERCUS PHELLOS	WILLOW OAK	3º CAL.	B&B	FULL, HIGH BRANCHED	
ZS	T	ZELKOVA SERRATA	JAPANESE ZELKOVA	3º CAL.	B&B	FULL, HIGH BRANCHED	
			SHRUBS				
CAS	EM	CORNUS ALBA 'SIBERICA'	TATARIAN DOGWOOD	2.5' SPR.	B&B	6'-0" O. C. SPACING	
KL	EM	KALMIA LATIFOLIA	MOUNTAIN LAUREL	2.5' HT.	B&B	5'-0" O. C. SPACING	
LB	EM	LINDERA BENZOIN	SPICEBUSH	2" HT.	POTS	PLANT AS DIRECTED	
V C	EM	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	3" HT.	B&B	4'40" O. C. SPACING	
V D	EM	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	4° HT.	B&B	6'-0" O. C. SPACING	
		•	PERENNIALS			•	
CCE	NW EM	COREOPSIS BIG BANG "COSMIC EYE"	COSMIC EYE TICKSEED	2 QT.	POTS	1'-6" O. C. SPACING	
EP	MM	ECHINACEA PURPUREA	PURPLE CONEFLOWER	2 QT.	POTS	1'-6" O. C. SPACING	
EM	MW WM	EUPATORIUM MACULATUM	JOE-PYE WEED	2 EYES	BARE ROOT	PLANT AS DIRECTED	
нн	MM	HELIOPSIS HELIANTHOIDES	FALSE SUNFLOWER	2 QT.	POTS	1'-8" O. C. SPACING	
LS	MM	LIATRIS SPICATA	TALL GAY FEATHER	2 QT.	POTS	2'-0" O. C. SPACING	
MP	MM	MENTHA PULEGIUM	PENNYWORT	2 QT.	POTS	1"-6" O. C. SPACING	
MEV	MM EM	MONARDA FISTULOSA VARIETIES	MIXED PERENNIAL VARIETIES BEEBALM	2 QT.	POTS	1'-6" O. C. SPACING	
PT	NW WM	PYCNANTHEMUM TENUIFOLIUM	SLENDER MOUNTAIN MINT	2 QT.	POTS	1'-6" O. C. SPACING	
RBM	MM EM	RUDBECKIA HIRTA 'BECKY MIX'	DWARF BLACK EYED SUSAN	2 QT.	POTS	1' 6" O. C. SPACING	
			FERNS				
MP	WM	MATTEUCCIA PENSYLVANICA	OSTRICH FERN	2 QT.	POTS	2'-6" O. C. SPACING	
		ORNAMENTA	AL GRASSES & GROUNDC	OVERS		•	
AG	WM MM	ANDROPOGON GERARDII	BIG BLUE STEM	FIELD CLUMPS	B&B	1'-6" O.C. SPACING	
AS	MM GM	ANDROPOGON SCOPARIUS	LITTLE BLUE STEM	FIELD CLUMPS	B&B	1'-6" O.C. SPACING	
CKF	MM GM	CALAMAGROSTIS ACUTIFLORA YARL FOERSTER!	KARL FOERSTER'S FEATHER REED GRASS	1 GAL.	POTS	4'40" O.C. SPACING	
CL	GM	CHASMANTHIUM LATIFOLIUM	WILD OATS (NORTHERN SEA OATS)	1 GAL.	POTS	2'-0" O. C. SPACING	
DC	MM GM	DESCHAMPSIA CAESPITOSA	TUFTED HAIR GRASS	1 GAL.	POTS	3'-0" O. C. SPACING	
ΕV	GM	ELYMUS VIRGINICUS	VIRGINIA WILD RYE GRASS	1 GAL.	POTS	310" O. C. SPACING	
PV	NW WM	PANICUM VIRGATUM	SWITCH GRASS	1 GAL.	POTS	3'-0" O. C. SPACING	



Grading Concept

The existing grade of the school yard is approximately 2.5%. The design maintained this 2.5% grade in most spots, as the same is true for the annex, but at .5%. Water has been directed into associated rain gardens.

Daniel Bramhall



Goals

To create an exciting and ecological schoolyard and community park for the Clara Barton Elementary School and Bordentown neighborhood.

Objectives

- Conduct an analysis of the existing site conditions to inform the design process.
- Develop conceptual design ideas guided by the analysis.
- Develop creative ideas based on best management practices.
- Maximize the uses in the space.
- Maintain educational objectives appropriate for the school's curriculum.
- Incorporate plant material that is ecologically sensitive, interesting and diverse to connect people to nature.

Design Concept

The final design maintains an open plan, flanked by new and exciting play areas. A large open free play area is in the center of the school yard. New gardens border the schoolyard that incorporate all of the program elements; areas of stormwater management, better play facilities and areas that allow for sensory and educational learning. All the educational areas would further enhance the learning experience while adhering to the school's curriculum.

The Annex portion of the design site also focuses on an open concept. A new plaza divides the space into three functional areas. The first is the gathering plaza area. The second is the community garden which affords residents the space to grow their own vegetables and herbs. The third is the multi-use open field area. The Annex is surrounded by a woodland border which gives it a naturalistic feel.

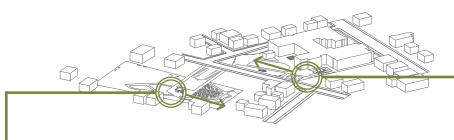
Master Plan



Perspectives



View of the schoolyard from the east entrance

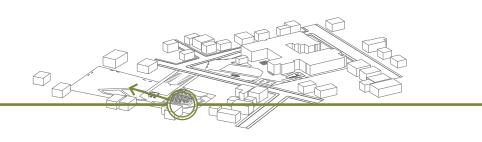


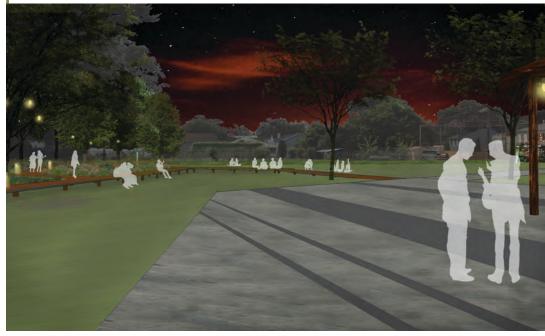


View looking east toward the community garden from the meadow boardwalk



View of the boardwalk meadow from the south portion of the plaza



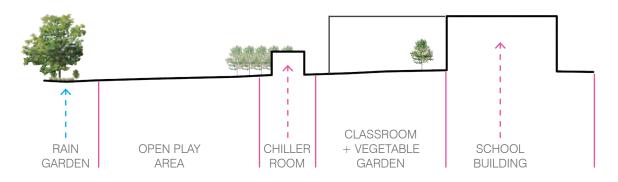


Night view of the boardwalk meadow from the south portion of the plaza

Grading Plan Crosswicks Street Clara Barton Elementary East Burlington Street West Street

Grading Concept

- The idea behind the grading was to minimize disturbance to the site by using the existing topography to my advantage.
- The site has a slope that would assist in the drainage required for stormwater management and I utilized this to direct the water to the newly placed rain gardens within the site.



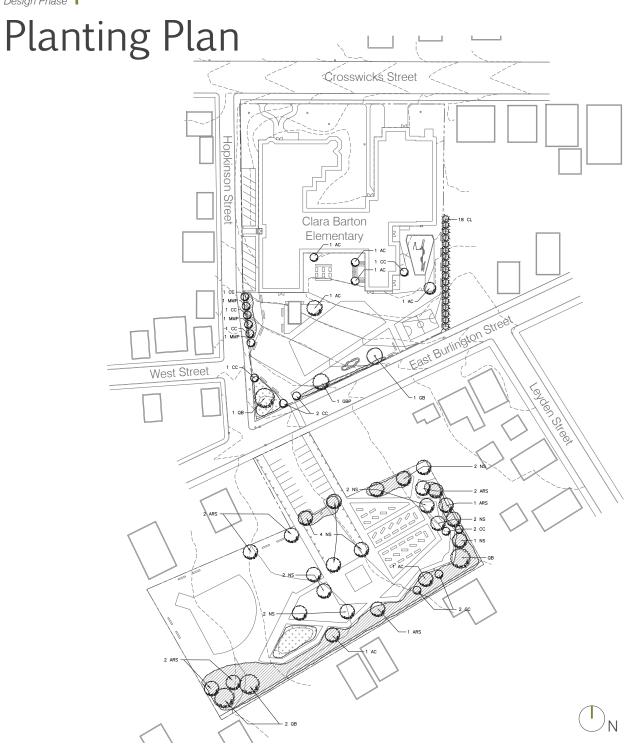
Schoolyard Looking West



Annex Looking North

Site Sections

- Site sections give the visual of open space to height relationships.
- These drawings give context of the site showing the ground plane, buildings and tree canopy to help visualize the space to depict the proximate adjacencies.



Planting Concept

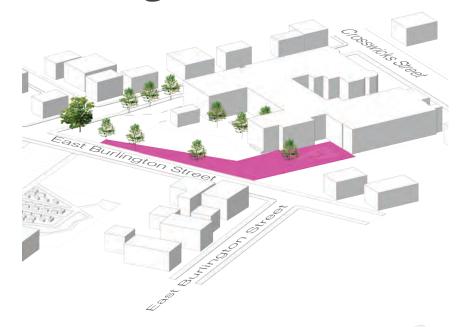
- The planting scheme focuses on use of native plants. After selecting a plant palette then came placement. Created in the plan is much needed shade and seating in many portions of the school yard which would facilitate a more comfortable environment.
- In the annex the idea was to mimic a naturalistic setting which would offer the visitor a respite from the urban town that surrounds the site. Created is a woodland edge along the southern portion of the property. Incorporated are new native herbaceous meadow areas.

Plants





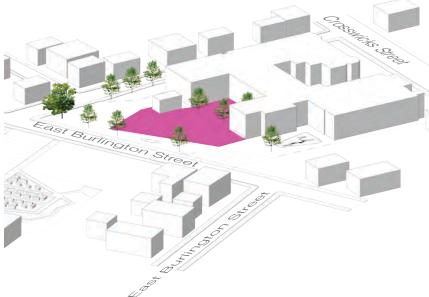
Phasing & Cost Estimates



PHASE 1 - SCHOOLYARD

Relocate Basketball Court New Play Equipment Perimeter Planting Buffer New Perimeter Fence Plantings

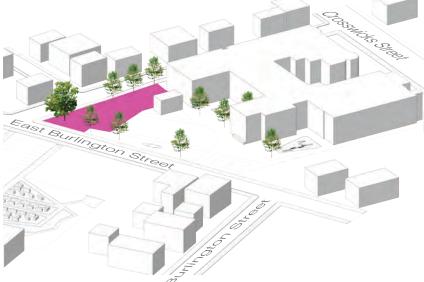
TOTAL - \$145,000



PHASE 2 - SCHOOLYARD

Educational Garden Stage & Outdoor Classroom SYNLawn® Turf Play Area **New Meadow Plantings**

TOTAL - \$55,000



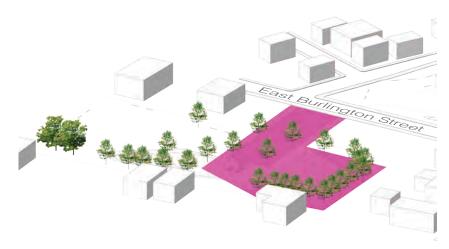
PHASE 3 - SCHOOLYARD

Rain Garden New Entrances Extra Seating Sensory Garden

TOTAL - \$45,000

PHASE 1 - ANNEX

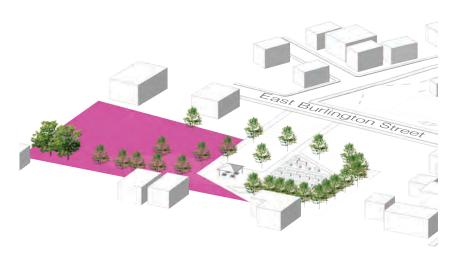
Community Garden Plaza Recreation Area Meadow Border Area Lawn Recreation Area Shade Structure TOTAL - \$130,000



PHASE 2 - ANNEX

Rain Garden Meadow Boardwalk + Viewing Area Meadow Border & Tree Planting Lawn Recreation Area

TOTAL - \$45,000



Phasing Concept

- The phasing was driven firstly by use. In the schoolyard the addition of new play structures would keep the children engaged during recess and times of play while the remaining phases are being implemented.
- The community garden was pinnacle to the success of the space so the phasing rationale was to ensure this was completed first.
- The second and third stages to the phasing enable the school to enhance their curriculum. Educational elements are a component of these phases. Note: cost does not include demolition.

Sarah Cunningham



Goals

To create an ecological schoolyard that incorporates sustainable design and provides children with educational & recreational areas.

Objectives

- Incorporate plants which attract wildlife, and vegetable garden.
- Add more play equipment.
- Incorporate seating areas for teachers, students, and parents.
- An amphitheater for outdoor assemblies to be held.
- Integrate outdoor classrooms.
- Design a representation of water flowing through the playground.
- Incorporate a rain garden.
- · Add a pavilion to the Annex property.
- Incorporate a community garden in the Annex property.
- Add a new Basketball Court to the Annex property.
- To design a walking path around the basketball court.
- To redesign the parking lot and create a drop off area.

Design Concept

The focus of the design was to create an ecological schoolyard, and a community park in the annex property. Wildlife gardens, and rain gardens were added to the design for the children to learn about the plant life, animals, and insects that the flowers attract, and to learn about storm water mangement. The rain gardens help control the current storm water problem the school experiences when it rains. The vegetable garden helps children learn how to grow, harvest, and learn where their food comes from. Additional playground structures are added for the second and third grade students. The outdoor classroom and ampitheater is added to bring the classes outside in order to learn about their outdoor environment.

In the Annex property the idea was to make sure both the schools and the community could use the space. A community garden is added in the center of the park to bring the community together, and plant vegetables, fruits, and flowers. There is a pavilion that the school and community can use for classes, meetings, or to use for shade. The basketball court is renovated and relocated so a path can be built around the court. The court can be converted for volleyball, and used as a tennis court. The use of the basketball court, path, and the open field. Is so the surrounding schools, and the community can have multi-use of the space without it being fitted for just one purpose.

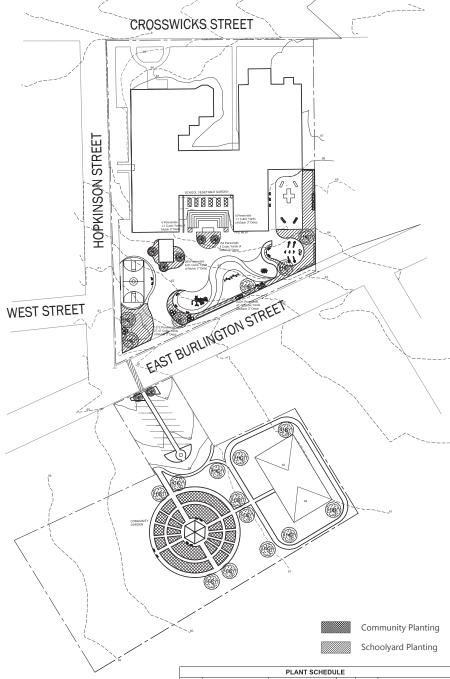
Master Plan CROSSWICKS STREET PLAYWORLD SYSTEMS BENCHES WILDLIFE GARDEN VEGETABLE GARDEN OUTDOOR AMPITHEATER **CLARA BARTON SCHOOL** PLAYWORLD SYSTEMS WATER PLAY TABLES WILDLIFE GARDEN BASKETBALL COURT HOPKINSON STREET PLAYWORLD SYSTEMS BOULDER OUTDOOR CLASSROOM WEST STREET EAST BURLINGTON STREET RAIN GARDEN PLAYWORLD SYSTEMS STEPPER PLAYWORLD SYSTEMS SWINGS BASKETBALL COURT ANNEX PROPERTY PLAYWORLD SYSTEMS TREE HOUSE PLAYGROUND IMPROVED PARKING LOT W/DROP OFF AREA OPEN SPACE FOR RECREATION ACTIVITIES

Grading & Planting Plan

Grading Concept

The grading concept for the schoolyard changes around the outdoor amphitheater area. The rest of the schoolyard remains the same so that the rain can be collected into the proposed rain gardens.

The grading concept for the annex property changes with the renovated parking lot, and the renovated and relocated basketball court. The property is relatively flat, so grading changes are very minimal.



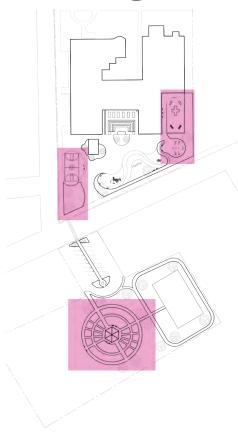
Planting Concept

The planting plan for the Schoolyard is designed to accommodate wildlife gardens, and rain gardens. The rain gardens will capture the stormwater to reduce to the existing storm-water runoff. The plant palette consists of all native plants, which have various bloom times. Flowering trees are added to provide shade throughout the schoolyard.

The planting plan for the annex property consist of native flowering trees to bring shade to the park. The community garden will include of vegetables, fruits, and flowers that the school and community will be maintained by the people who use them.

		2222					
PLANT SCHEDULE							
Abbrev.	Latin Name	Common Name	Ht.	Spread	Comments		
		Trees					
GB	Ginkgo biloba	Ginko			Existing		
QP	Quercus palustris	Pin Oak			Existing		
GT	Gleditsla triacanthos	Honey Locust			Existing		
CF	Cornus florida	Flowering Dogwood	15'-30'	15'-30'	B&B, Blooms April		
HC	Halesta carolina	Carolina Silverbell	30'-40'	20'-35'	B&B, Blooms April		
		Shrubs					
CA	Ceanothus americanus	New Jersey Tea	3'-4'	3'-5'	Blooms May-July		
	н	erbacious					
AT	Asclepias tuberosa	Butterfly Weed	1'-2.5'	1'-1.5	Blooms July to August		
PVS	Panicum virgatum 'Shenandoah'	Switchgrass	3'-4'	3'-4'	Blooms July to Febuary		
LS	Lobelia siphiltica	Blue Cardinal Flower	2'-3'	1'-1.5'	Blooms July to September		
LC	Lobelia cardinalis	Cardinal Flower	2'-3'	2'-2.5'	Blooms July to September		
EP	Echlnacea purpurea	Purple Coneflower	2'-5'	1.5'-2'	Blooms June to August		
CG	Chelone glabra	Turtlehead	2'-3'	1.5'-2.5'	Blooms August to October		
EF	Eutrochium fistulosum	Joe-pye-weed	4'-7'	2'-4'	Blooms July to September		

Phasing & Cost Estimates



Phase 1:

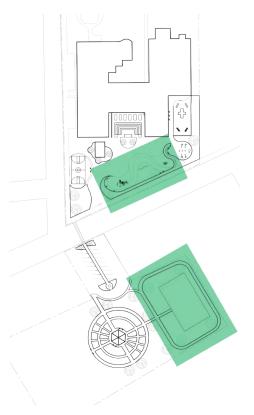
School: Will include the construction of the outdoor classroom and the wildlife garden in the kindergarten, and first grade play area. This will give the teachers an outdoor space to teach their students about the plants that attract wildlife. This construction phase will include the rain garden, and improving the basketball court of the second and third grade play area. The rain gardens will help with the existing storm-water problems at the intersection.

Annex: The construction of the community garden. In the center of the community garden will be the pavilion where community meetings and outdoor classes can be held.

Phase1 Costs:

- Equipment \$41,000
- Asphalt removal \$29,000
- Benches \$8,000
- Gravel \$1,000
- Pavilion \$40,000
- Padding around Basketball Court \$5,000

TOTAL COST = \$144,000



Phase 2:

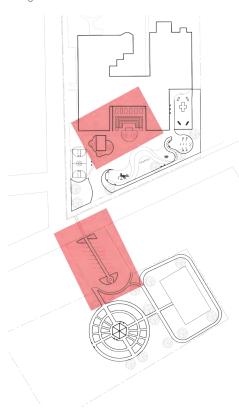
School: The construction of the playground for the second and third grade students, along with the rain garden that surrounds the play area. The play area will have rubber surface underneath the play equipment, and new playground equipment suitable for their age group. Playground equipment consists of swings, the treehouse playground from Playworld Systems, and the Playworld Systems stepper.

Annex: The construction of the new improved basketball court, which can be converted into a tennis and volleyball court. Surrounding the basketball court would be a track which can be used by the schools gym class, and by the community.

Phase 2 Costs:

- Gravel \$900
- Asphalt for Basketball court \$15,000
- Asphalt removal \$4,000
- Protective Surfacing \$79,000
- Equipment \$46,000
- Planting cost \$14,000

TOTAL COST = \$158,000



Phase 3:

School: The construction of the outdoor ampitheater which the school can use for outdoor classrooms as well as outdoor assemblies. The school's vegetable garden is included in this phase which would be used to help children learn how to grow and harvest their own food. In the wildlife gardens, the children can learn about the plants and animals that they attract.

Annex: The construction would be to improve the parking lot area. The parking lot will have a walkway constructed in the medium strip at the center of the parking area that the children from the schools can walk safely across the street. The parking lot would also have a drop off area. The removal of the garage will add space in order to provide a drop off area to the new park.

Phase 3 Costs:

- Parking Lot \$25,000
- Gravel \$200
- Concrete removal \$8,000
- Concrete sidewalk \$3,000
- Asphalt removal \$14,000
- Excavation \$22,000
- Concrete for Amphitheater \$12,000
- Planting cost \$7,000

TOTAL COST = \$89,995

TOTAL PROJECTED COST = \$391,000

Perspectives



Outdoor Classroom



Community Garden

Jerome Hinds



Goals

- Create an eco-schoolyard that enhances children's development and motor skills while also incorporating concepts of green infrastructure.
- Create an inviting community space that includes a community garden and recreation area.

Objectives

- Building play structures such as stepping logs and swings will enhance the aesthetics of the children's play environment and help develop their motor skills.
- Creating an outdoor classroom will provide an outdoor learning environment for children to develop their learning skills.
- Including a Children's Garden with diverse plants gives them the opportunity to create a sensory aspect.
- Adding a rain garden to the schoolyard will help control stormwater runoff.
- Incorporating features such as a community garden, water feature, shade structure, and better lighting will create an engaging, comfortable, safe community area.
- Incorporating low maintenance, and attractive plantings will create an aesthetically pleasing schoolyard and community area.

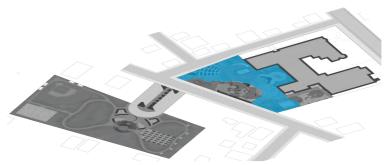
Design Concept

- The main idea behind the design of the schoolyard is the creation of a central play area that draws visitors from all sides of the schoolyard. The spaces surrounding the central play area are designed with same geometric shape
- The community area is designed with the similar geometry as that of the schoolyard. The community area has a central focal point that can be seen from all directions. The surrounding spaces radiate out forming the shape of a butterfly.
- The children's garden, outdoor classroom, basketball court, and K-1st grade play area follow a circular pattern that extends from the 2nd-3rd grade play area.
- The circular geometry with different colors highlights the different playground area by creating an attractive ground plane pattern.
- The path's geometry and color attract people into the schoolyard and will be an exciting central area for teachers, parents, and children.
- The community area has a symmetrical design for clear organization.
- The placement the basketball court and baseball field on the west side of the community area help dissipate sound from reaching the quieter east side where the garden plots are located.

Master Plan



Phasing & Cost Estimates



Phase 1

The addition of the Children's Garden, new basketball court, outdoor classroom, and pavement patterns will attract community attention. Connecting to nature is the main focus.

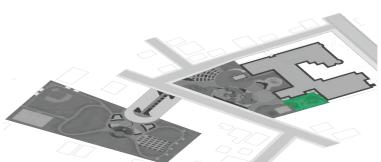
Children's Garden:	\$ 5,000
Basketball Court:	\$ 9,000
Outdoor Classroom:	\$ 1,600
Concrete:	\$ 37,500
Asphalt removal:	\$ 50,900
Total:	\$ 104.000



Phase 2

The addition of the community garden plots, baseball field refurbishment, shed, and paths will greatly bring the community together in a central area. This could blossom into a hub for community events.

Community Garden:	\$ 9,900
Walkway Asphalt:	\$ 42,200
Baseball Field:	\$ 5,000
Parking Lot:	\$ 80,000
Shed:	\$ 4,900
Total:	\$ 142 000



Phase 3

This phase consists of the kindergarten to 1st grade play area. The renewal of the K- 1st grade playground area will greatly increase the aesthetics of the east side of the schoolyard.

Play equipment:	\$ 40,000
Play surface:	\$ 46,200
Total:	\$ 86.200



Phase 4

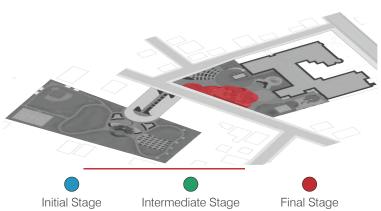
The addition of the new basketball court, pond, fountain, and gazebo in the Annex will further enhance and complete the Annex area. This will create a thriving community space.

Fountain:	\$ 600
Pond:	\$ 1,500
Gazebo	\$ 13,000
Brick work:	\$ 16,700
Shade Structures:	\$ 1,500
Basketball Court:	\$ 16,000
Total:	\$ 49 300



This phase consists of the final, most expensive item of the project: 2nd & 3rd grade play area and the rain garden.

Play Surface:	\$ 55,000
Cement wall:	\$ 2,500
Rain garden:	\$ 17,800
<u>Play equipment:</u>	\$ 90,000
Total:	\$ 165,400
School yard: Annex: Grand Total:	\$ 355,600 \$ 191,300 \$ 546,900



Perspectives



Flowering Tree Entrance

Entrance from the corner of E. Burlington & Hopkinson St., is embraced by beautiful flowering trees. Along the path, on the left is the Children's Garden. Further, into the schoolyard is the new 2nd & 3rd grade play area. At the top of the path, is the new outdoor classroom. In front of the outdoor classroom is a stage.



Garden Entrance

When you enter from Hopkinson St., one will be welcomed by the new Children's Garden. In the background, one will quickly notice the new 2nd to 3rd grade play area. The new play area will consist of swings, slides, walking logs, etc.



Fountain Entrance

The East Burlington Street entrance greets visitors with a new fountain. Once one enters the space, the new shade structures will provide ample shade for visitors. Behind the new fountain is the gazebo that is surrounded by a pond area. On both sides of the fountain area, benches are incorporated and lined with boxwoods to create an intimate space.





Planting Plan

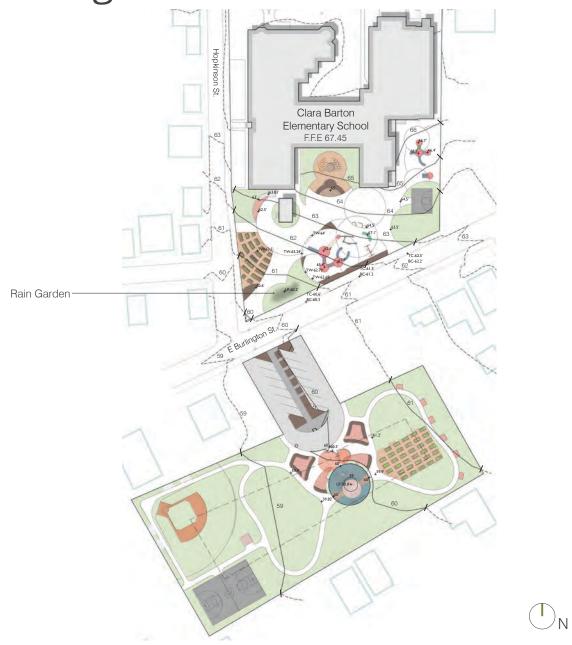


Planting Concept

The Planting Plan is comprised of a mix of natives and non-natives. Most plants were selected for aesthetic qualities and low maintenance.

			Т	REES				
Symbol	Botanical Name	Common Name	Qty.	Size	Root	Comments	\$ Per Plant	Per plant X qty.
POC	Platanus occidentalis	Sycamore	2	3" Cal.	B&B	Full, High Branched	\$45	\$90
QPH	Quercus phellos	Willow Oak	16	6' HT	B&B	Full, High Branched	\$50	\$800
CJ	Cercidiphyllum japonicum	Katsura Tree	2	10' HT.	B&B	Full	\$59	\$118
PS	Pinus strobus	Eastern White Pine	1	8' HT.	B&B	Full, Unsheared	\$45	\$45
PA	Picea abies	Norway Spruce	4	8' HT.	B&B	Full, Unsheared	\$79	\$316
CF	Cornus florida	Flowering dogwood	14	8' HT.	B&B	Full	\$24	\$336
CC	Cercis canadensis	Eastern redbud	13	10' HT	B&B	Full	\$38	\$494
			SH	IRUBS				
BSW	Buxus sempervirens 'Varder Valley'	Boxwood	80	18" HT.	B&B	3' spacing	\$19	\$1,520
TOE	Thuja occidentalis 'Elegantissma'	Dark green arborvotae	123	6' HT	B&B	3' spacing	\$17	\$2,091
		Sh	rub Gro	uping (GR	P. 1)			
HQ	Hygrangea quercifolia	Oakleaf Hydrangea	85	2' SPR	B&B	3'- 6' spacing	\$15	\$1,230
FG	Fothergilla gardenii	Dwarf fothergilla	85	18" SPR	B&B	3'- 6' spacing	\$25	\$2,125
CA	Clethera alnifolia	Summersweet Clethera	85	2' HT.	B&B	4' spacing	\$20	\$1,700
		PEI	RENNIAI	S MIX (P.	MIX)			·
EP	Echincea purpurea	Purple Coneflower	176	2 Q.T.	Pots	1'-6" spacing	\$10	\$1,760
CV	Coreopsis Verticillata	Threadleaf cereopsis	210	2 Q.T.	Pots	1'-6" spacing	\$8	\$1,680
LS	Liatris spicata	Tall gay feather	233	2 Q.T.	Pots	1'-6" spacing	\$7	\$1,631
AM	Achillea millifolium	Common yarrow	195	2 Q.T.	Pots	1'-6" spacing	\$7	\$1,225
Rain Garden Mix								
EF	Eupatoruim fistulosom	Joe Pye Weed	17	2 Q.T.	Pots	3' spacing	\$8	\$136
Al	Asclepias incarnata	Butterfly weed	13	2 Q.T.	Pots	2' spacing	\$10	\$130
JF	Juncus effusus	Soft rush	22	2 Q.T.	Pots	3' spacing	\$9	\$198

Grading Plan



Grading Concept

The schoolyard grading is relatively gentle with an overall slope of 3.3%. A portion of the water that enters the site will gradually make its way into the rain garden. The community garden grading is relatively flat with an overall slope of .9%.

Wayne Hoffman



Goals

Create a play environment that incorporates a safe and challenging educational setting.

Objectives

- Create imaginative play spaces
- Incorporate rubberized surfaces with play equipment
- Provide space for class gardening projects
- Plant trees and flowerbeds
- Manage stormwater runoff from schoolyard
- Locate community garden space
- · Replace asphalt surfaces with more permeable materials
- Create improved parking with ADA accessibility

Design Concept

The scope of the project within the schoolyard is delineated into four areas. The first area of consideration concerns the removal of the decaying asphalt paving found throughout the schoolyard. The second area emphasizes the introduction of rubberized poured in place play surfacing which will also occur with regard to phasing. The third area of emphasis concerns expansion and relocation of spaces containing play equipment as well as the incorporation of imaginative play areas. The outdoor classroom, bench seating, and optional shade structures as well as the play areas may also be considered according to phasing options. The fourth area to be considered centers on establishing planting beds and introducing trees.

The Annex follows a similar pattern of development, beginning with establishing an improved parking lot. With the parking lot comes a basketball court to draw visitors to the Annex. Creation of the Community Garden can commence once these elements are established. The implementation of tree planting and flower beds may also be considered in accordance with phasing options. The Community Recreation Center proposal may be acted upon at the community's leisure.

Master Plan



Master Plan

Schoolyard

This design accentuates the site with colorful orange bands curving towards the formal entrance located at the southwest corner of the schoolyard. The easternmost portion of the site is allotted for play equipment. It is visually separated by a concrete path. The younger age group are nestled closer to the building, while the older children get more challenging play equipment (southeastern corner of the schoolyard).

The courtyard of the design features an outdoor classroom surrounded by a wildflower bed. It is also largely paved with pervious asphalt to accommodate emergency vehicle access and for assembling the children before and after classes. A sundial and painted track outline are also integrated into the space.

The western portion of the schoolyard is where the older children play basketball on the miniature basketball court or exercise their imaginations on the small stage located at the south wall of the chiller house. A small project garden is present at the northwestern corner of the schoolyard for conducting class gardening experiments. Maple and Zelkova trees line the perimeter of the schoolyard.

Annex

The design of the Annex is an open plan. The overall scheme focuses on community activity and the prospect of being used for community based events such as gardening or festivals. The parking lot is expanded and extends into the north eastern corner. It is ADA accessible and is constructed with pervious asphalt. A full sized basketball court is located parallel to the parking lot.

A proposed recreation center is located at the center of the site. It can accommodate numerous community and after school programs and activities. The orientation of the structure takes advantage of the southern sun exposure. The open field in the center of the design is large enough to accommodate improvised field games and community events. A cinder gravel path frames the field.

The western portion of the Annex features a sizable Community Garden, containing numerous garden plots and a small orchard. Pedestrian entrances are dilineated arbored gates. A gazebo provides shade and a place to rest for gardeners. A large storage shed is located at the northern corner of the garden. It is next to a truck drop off entrance adjacent to a church alley.

Perspectives

Schoolyard

View of the relocated emergency vehicle access and formal entranceat the corner of Hopkinson and Burlington streets. Schoolyard improvements include play equipment, basketball court, outdoor classroom, and project garden.



Annex

The southern view of the annex shows the entry into the annex, the Community Center and access to the basketball court. The Community Garden is across the open field to the west of the property.



Phasing Plan

Schoolyard

Phase 1

Focus is on redeveloping K-1 play area. Phase 1 includes:

- 1. Removal of asphalt surfacing.
- 2. Reorientation of ADA ramp for ease of access and improved traffic flow.
- 3. Installation of poured in place play
- 4. Reuse existing play equipment and addition of play equipment for older
- 5. Creating and installing perennial wildflower buffers and trees.
- 6. Installing poured concrete sidewalks.
- 7. Installing benches seating and shade structures (optional).

Annex

Phase 1

Focus is on improving site access and community use.

- 1. Improving and expanding parking lot area, to include a passenger drop off point and handicap parking spaces.
- 2. Installing and repairing concrete sidewalks.
- 3. Install full size basketball court with refurbished existing furnishings.
- 4. Installing benches.

Phase 2

Focus is on redeveloping grade 2-3 play area. Phase 2 includes:

- 1. Removal of asphalt surfacing.
- 2. Installation of half scale basketball court with existing furnishings.
- 3. Installation of poured in place play surfacing to include partial short track.
- 4. Construction of 18" (H) stage to facilitate imaginative play.
- 5. Creating and installing perennial wildflower buffers and trees.
- 6. Developing garden plots for class projects.
- 7. Installation of permeable asphaltic pavers for gathering/ walking spaces.
- 8. Construction of formal entrance on corner with prominent location of existing monument.
- 9. Installing benches.

Phase 2

Focus is on developing a Community garden space.

- 1. Site garden plots.
- 2. Site small orchard space.
- 3. Material drop off point located adjacent to existing church alley.
- 4. Construction of site appropriate shed.
- 5. Create and install perennial wildflower buffers and trees.
- 6. Optional installation of gazebo and entrance trellises.
- 7. Place benches.

Phase 3



- 1. Removal of asphalt surfacing and replacing with permeable asphaltic pavers.
- 2. Installation of outdoor classroom space.
- 3. Installation of poured in place play surfacina.
- 4. Placement of interactive sundial.
- 5. Creating and installing perennial wildflower buffers, durable turf grasses, shrubs and trees where appropriate.
- 6. Repainting short track to combine with previous installation.
- 7. Relocating emergency vehicle access gate to Burlington Street for improved access.
- 8. Installing benches.

Phase 3

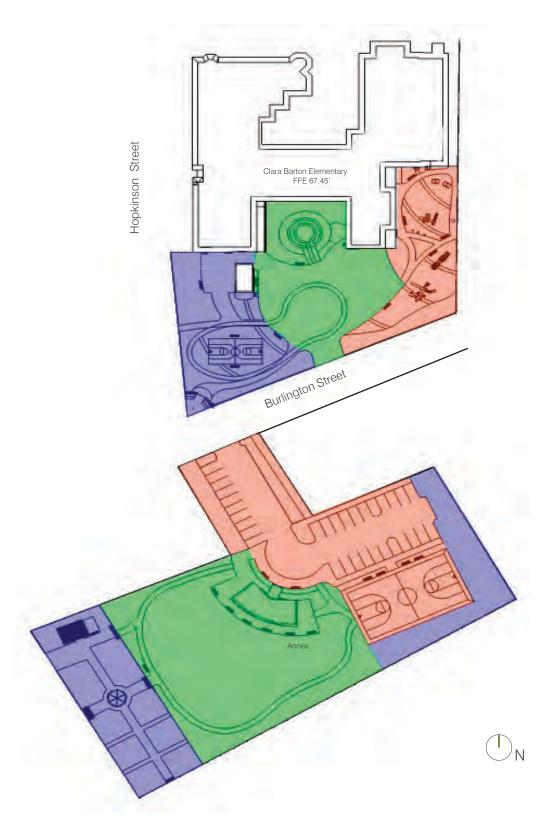


- 1. Creation of open field space to accomodate group activities.
- 2. Providing site accomodation for community recreation and event
- 3. Creating system of cinder paths.
- 4. Place benches.
- 5. Creating and installing perennial wildflower buffers, durable turf grasses, and trees where appropriate.



Phasing Diagram

Crosswicks Street



Cost Estimates

Schoolyard

Phase 1	 Poured in Place play surfacing @ \$11.25 per sq. ft. installed: \$66,127.50 Concrete @ \$4.25 per sq. ft. installed: \$7,616.00 3 2"cal. shade trees: \$600.00 Additional play equipment: \$30,000.00 Perennial wildflower seed mix: \$62.00 Soil preparation: \$32,340.00 Benches: \$5950.00 2 Play Houses: \$1200.00 	Phase 1 \$143,895.50
Phase 2	 Poured in Place play surfacing @ \$11.25 per sq. ft. installed: \$34,155.00 Pervious asphalt @ \$1.50 per sq. ft. \$4662.00 10 2"cal. shade trees: \$2,000.00 Soil preparation: \$114,360.00 perennial wildflower mix seed: \$62.00 Benches: \$3,400.00 Half scale basketball court surface: \$1,762.00 	Phase 2 \$160,401.00
Phase 3	 Poured in Place play surfacing @ \$11.25 per sq. ft. installed: \$18,315.00 Pervious asphalt @ \$1.50 per sq. ft.: \$14.029.00 1 2"cal. shade tree: \$200.00 Soil preparation: \$66,420.00 perennial wildflower mix seed: \$124.00 Outdoor classroom: \$10,000.00 2 5 gallon Witch Hazels: \$120.00 	Phase 3 \$109,208.50 Total Schoolyard Cost Estimate \$413,505.00

Annex

Phase 3

	 Concrete @ \$ 4.25 per sq. ft. installed: \$16,978.00 	i ilase I
	 Curbing @ \$15.00 per sq. ft. installed: \$9,075.00 	\$157,627.00
	 5 2"cal. shade trees: \$1,000.00 	
	 Perennial wildflower seed mix: \$124.00 	
	• Benches: \$3,400.00	
	Basketball court: \$7,050.00	
Phase 2	• Large shed: \$5,500.00	Phase 2
	• Crushed gravel: \$12,932.00	
	• 1 2"cal. shade trees: \$200.00	\$32,244.00
	• Benches: \$1,700.00	
	 3 Large trellises: \$6,000.00 	
	 Gazebo: \$3,000.00 	

Concrete surfacing @ \$4.25 per sq. ft. installed: \$15,703.008 2"cal. shade trees: \$1,600.00 Phase 3 • Perennial wildflower mix seed: \$548.70 \$36,101.70 Gravel path: \$10,600.00 Benches: \$7,650.00 Recreation center structure: TBD by Architect

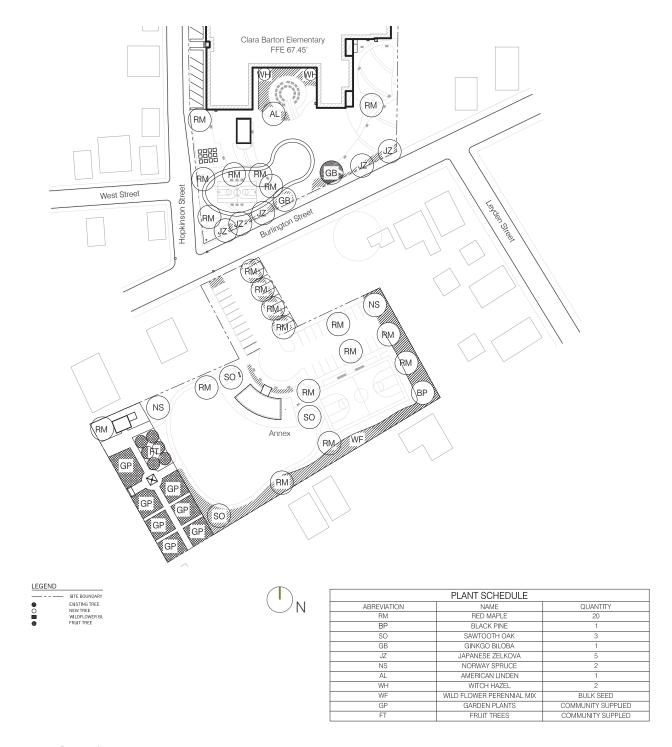
Phase 1 • Pervious asphalt parking surface: \$120,000.00

Total Annex Cost Estimate

\$225,972.70

Phase 1

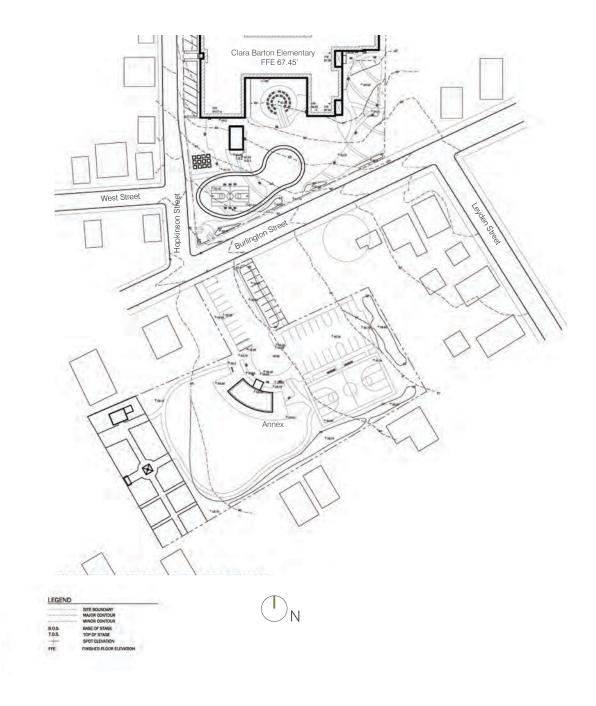
Planting Plan



Planting Concept

This design specifies the addition of trees and perennial wildflower beds. The use of wildflower beds as a buffer will slow water runoff from the schoolyard. The deep root systems provided by the flowers will also infiltrate water more efficiently than turf grasses. Trees were selected based on growth habit and shade potential in relation to overhead obstacles (i.e. power lines).

Grading Plan



Grading Concept

The grading plan for this design is only slightly modified from the existing grade. The kindergarten The grading plan for this design is only siignily mounted from the calculage. The southern play equipment area grade is adjusted to accompdate recontoured surfacing. The southern play equipment area grade is adjusted to accompdate recontoured surfacing. The southern play equipment area grade is adjusted to accompdate recontoured surfacing. The southern play equipment area grade is adjusted to accompdate recontoured surfacing. boundary reflects changes to accomodate shallow bioswales in the buffer planting beds.

Julia Kotarsky



Goals

To create a schoolyard and community space that is based on ecological and sustainable concepts and provides opportunities for education.

Objectives

- Increase shade and green spaces for children
- Create an outdoor classroom for the schoolyard
- Implement porous paving
- Include rain gardens and bio-swales to introduce rainwater management
- Construct a community garden

Design Concept

The main design concept for the Clara Barton Elementary Schoolyard and Community Park was based on creating open green space. This concept affords children the opportunity to use the space for creative and physical activities. The schoolyard will consist of an open green space, educational gardens and rubber play surfaces. An additional rubber play area will be constructed in the center of the playground, where the sundial can be placed. The existing rubber play area is to be extended, and two green spaces are to be added into the schoolyard. An educational space is to be constructed in the courtyard. The gathering areas near the school entrances and the pathways are to be refurbished using concrete. Curvilinear pathways are to be created with rain gardens and butterfly gardens following the pathways.

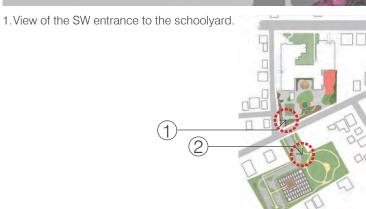
The existing parking lot is to be moved further into the annex so that it is not a visual obstruction in to the site. The parking lot and roadway are both bordered with a bio-swale and shrub border to reduce rainwater runoff from the site. The fenced community garden will be installed in the center of the annex space, accessible from the parking lot and East Burlington Street. A pavilion will be constructed for the convenience of community garden users. This structure provides a space for shade, community gatherings, and personal use within the community garden. The park space will have a circular path with shade sails in the center of the space for all users of the park.

Master Plan



Perspectives





2. View of the community park from the entrance path.



Phasing & Cost Estimates

Phase 1: Outdoor Classroom Space

This phase primarily focuses on building the stage, seating and the open grass space surrounding the courtyard. This also includes the placement of trees in the open space and along the face of the school and fence. The cost of this phase is based on the plant materials and grass seed, along with the installation and material for the stage. It also includes the masonry units needed to construct the seating for the stage and the preparation and overlay of the new concrete.

Plant material: \$4,500 Wood material: \$3,000 Stone material: \$10,000 Paving material: \$8,500

Total Cost: \$25,000-\$27,000

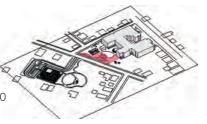


Phase 2: Gardens and Rubber Play

Phase 2 focuses on three aspects. The rain garden and butterfly gardens (along the south fence), resurfacing of the surrounding concrete area, and installation of the rubber play area in the center of the schoolyard with a proposed sundial at its center. The cost is based on the plant materials and the preparation and overlay of new concrete and rubber material.

Plant material: \$2,600 Concrete: \$10,000 Rubber surface: \$13,000

Total Cost: \$26,000-\$30,000



Phase 3: Garden and Basketball Court

Phase 3 consists of the installation of the rain garden and butterfly garden (along the west fence) and the replacement of the basketball court. This phase will also include the installation of a minor green space, along with a seating area near the entrance to the school. The estimate for this phase consists of the plant materials installation, benches for the seating area near the school entrance, concrete overlay, and the new layout and hoops for the basketball court.

Plant material: \$150 Seating: \$1,000 Paving material: \$8,500 Basketball court:\$15,000

Total Cost: \$32,200-\$45,500



Phase 4: Play Area

This phase focuses on the development of the secondary green play space, rain garden, along with the expansion and replacement of existing rubber material. The green space to be developed will include a natural play structure. The cost estimate is based on the planting materials, rubber play area, and the concrete overlay for the rest of the space. Phase 4 will be the last phase for the development of the schoolyard.

Plant material: \$108 Rubber surface: \$22,500 Paving material: \$5,000 Play structure: \$700

Total Cost: \$28.300-\$35.000



Phase 5: Community Garden

This phase will begin the construction of the Community Park. The components that will be developed during this phase will include a new parking lot and community garden, additional trees and bordering shrubs, and the installation of bio-swales. The cost estimate for this phase includes plant materials, preparation and development of the parking lot (including the roadway leading to the parking lot), construction of the community garden, and the pavilion in the center of the community garden.

Plant material: \$17,000 Parking lot: \$48,000 Comm. Garden: \$10,000

Pavilion: \$15,000

Total Cost: \$91,000-\$140,000

Phase 6: Community Park

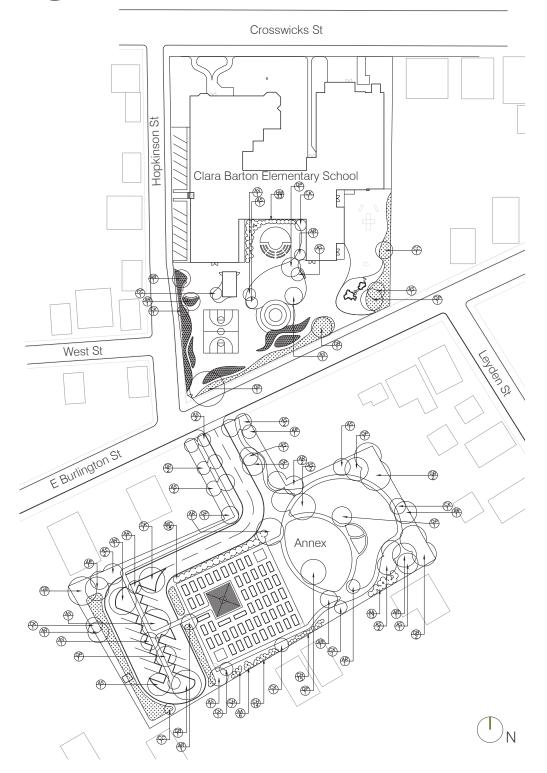
Phase 6 is the final phase of the Člara Barton School redevelopment project. This phase will focus on the construction of the Community Park on the other half of the annex space. The park will consist of a green space with trees, a series of paths, and a shade structure. The cost is based on the plant materials, preparation and installment of the pathway, and the shade structure.

Plant material: \$795 Pathway: \$56,000 Shade structure: \$15,000

Total Cost: \$72,000-\$90,000



Planting Plan



Planting Concept

The vegetation selected for the Clara Barton School and Community Park Project are mostly native plants that are visually appealing and have attractive fall colors. Two particular tree species were chosen for their spring bloom. All of the tree species selected are native to the area with the exception of the Ginkgo tree. The shrubs were also chosen for their fall and spring colors along with their flowering qualities. The Wax Myrtle planted along the roadway are salt-tolerant. The vegetation for the rain garden have the ability to tolerate dry and wet conditions, and are also appropriate for the butterfly garden.

TREES SHRUBS RAIN GARDEN **BUTTERFLY GARDEN**



Red Maple



Sugar Maple



Eastern Redbud



Flowering Dogwood



Ginkgo



Pin Oak

Red Chokeberry



Plum Yew



Bigleaf Hydrangea



Waxberry



Butterfly Weed



Summersweet



Switch Grass



Goldenrod



Indiangrass



China Aster



Wild Cosmos



Coneflower



Baby's Breath



Baby Snapdragon



Black-eyed Susan



Catchfly

Images:

http://treesofsantacruzcounty.blogspot.com/2013/04/acer-rubrum-red-maple.html

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http://plants.squakmtnursery.com/12230001/Plant/47/Red_Chokeberry

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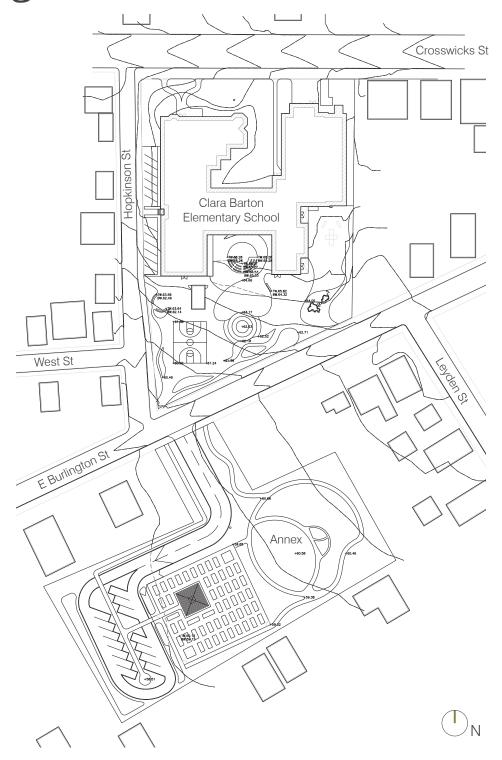
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http://floreznursery.blogspot.com/2013/11/gypsophila-elegans-covent-garden.html
http://www.seedterra.com/spurred-snapdragon-linaria-maroccana-seeds.html
http://growingwithsuttons.diy.com/Shop/Flower+Seeds/Lavatera+trimestris+Beauty+Mix+Seeds+118891.htm

http://sbwildflowers.wordpress.com/wildflowers/fabaceae/lupinus/lupinus-succulentus/
http://www.georgiavines.com/cart/index.php?main_page=product_info&products_id=636
http://www.gopixpic.com/650/rudbeckia-hirta-black-eyed-susan/http:||aprairiehaven*com|uploads|img487d3a843cdc6*jpg/

http://www.kerneliv.dk/en/sage/664-salvia-coccinea-lady-in-red-scarlet-sage.html http://www.plantparadise.ca/Silene Armeria.html

Grading Plan



Grading Concept

The grading plan works with the existing contours and minimizes the changes to the existing grades. The grade at the schoolyard and annex flows from the northeast corner of the site to the southwest corner. In the schoolyard, the rainwater will be captured by the rain gardens along the west and south property line, as they flow towards the southwest corner of the site. At the Community Park, rainwater will flow across and off of the site except for the parking where it will be captured by the bioswales along both sides of the parking lot.

Ethan Olson



Goals

The goal of the design is to establish an educational and ecologically sustainable schoolyard that is connected to a community park.

Objectives

- Decrease asphalt and compacted surfaces.
- Add a community garden to the annex property. Restore the ball field.
- Add a pavilion/outdoor theatre for community gatherings and educational events.
- Add play structures to the schoolyard and incorporate natural play areas.
- Plant shade trees or provide a shade structure throughout both sites.
- Increase the infiltration and collection and use of storm water on the site.

Design Concept

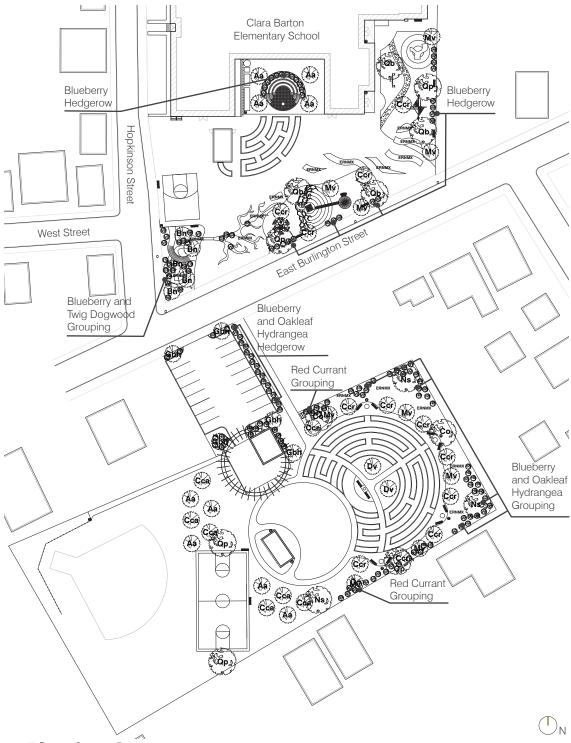
he main design concept for the educational and ecological schoolyard was to incorporate natural I play features with built structures, increase tree plantings for shade, introduce edible hedgerows, and incorporate an outdoor classroom. Earth mounds, willow tunnels, and rock climbing walls with play structures such as Activo Iver and Unity Dome from Playworld Systems for the schoolyard playgrounds. The outdoor classroom consists of garden beds, an amphitheater, an outdoor kitchen, compost area, and a greenhouse.

The annex design concept incorporated features such as a community garden, an outdoor stage, open central lawn, sports fields, and a drop off area, and community center.

Master Plan



Planting Plan



Planting Concept

he plants proposed for the schoolyard and annex are primarily native plants that also attract wildlife. Many of the plants produce edible fruits and berries and have seasonal flowers and foliage with interests. There are certain plant communities that portrayed in the proposed grassland meadow drifts, dendritic stream patterned swale that leads to the rain garden. Conceptually, the schoolyard transitions from a bluff community into a mesic lowland. In the Upland kindergarten themed area there are blueberry buffers along the fence with Oaks and Redbuds. It then leads into a grassland plant community in the drifts and slowly transitions into more woody species such as Twig Dogwood and lowland wildflowers and terminates in a mesic rain garden with a grove of River Birch. The annex and schoolyard are designed for educational purposes as well as to attract wildlife and to produce edible fruits and berries the community can harvest



Qb-Swamp White Oak





Vc-High Bush Blueberry





Dp-American Persimmon



Hv-Witch Hazel



Ccr-'Rising Sun' Redbud





Cs-Variegated Twig Dogwood



Cc-Ironwood





Cr-'Flava' Trumpet Vine







Co-Shagbark Hickory

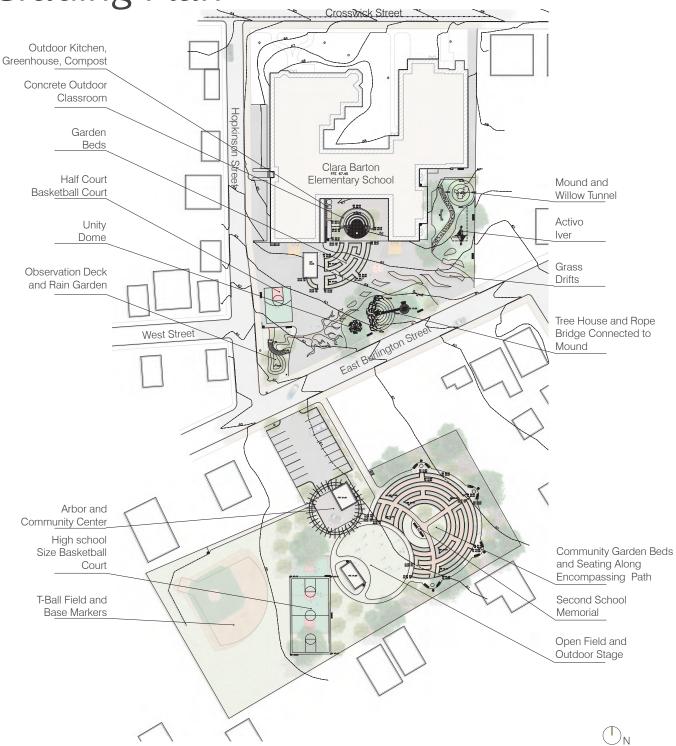






Pq-Virginia Creeper

Grading Plan



Grading Concept

The grading concept maintains most of the existing grading which has good positive drainage. The change in the grading occurs at the garden beds, outdoor classroom, rain garden, and earth mounds in the schoolyard.

The grading change in the Annex occurs mainly in the garden beds, the pathways, and the main entrance to the park. Minimal fill is required mainly for the earth mounds and the garden beds. To reduce grading costs, no major grading changes were proposed for the site.

Perspectives



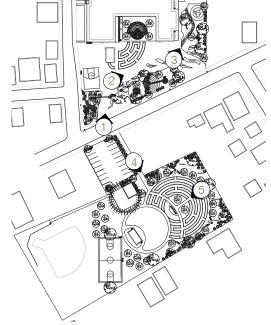
North East view from main entrance



South East view of Annex with Community Center building and garden beds in the background



East view of garden beds and wildflower swale with 2nd and 3rd grade playground





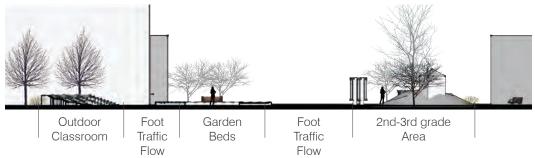
North East view of Kindergarten and 1st grade playground area facing



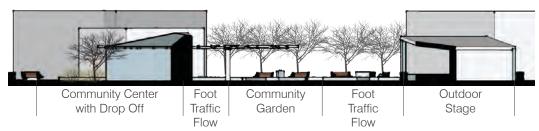
Second school memorial facing West in Community Garden

Sections

Schoolyard



Annex



- Major structures and localizes designed grading changes
- Site furnishings such as play equipments and benches
- Tree and understory plantings

Before and After Analysis

Annex and Schoolyard

Pre Installation

65 percent impervious surface

35 percent pervious surfaces

Post Installation

47.5 percent impervious surface

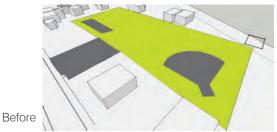
52.5 percent pervious surfaces

Overall increase of - 17.5 percent pervious surface

Schoolyard



The existing schoolyard is 95 % asphalt paved surface with 5 % landscape beds.



The existing annex is 70 % pervious and 30 % with little to no infiltration of water.



Proposed plan shows 45 % increase in pervious surfaces and the addition of a bioswale and rain garden.



Proposed plan shows the pervious surface decreases to 55 % and impervious surface increases to 45 %.

Phasing & Cost Estimates

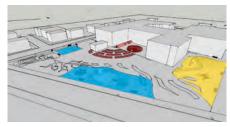
Schoolyard



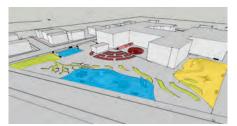
Phase 1-Outdoor Classroom \$60,000-\$65,000



Phase 2-K and 1st grade playground \$135,000-\$140,000



Phase 3-2nd and 3rd grade playground \$145,000-\$150,000



Phase 4-Rain garden and plant communities \$45.000-\$50.000

Annex



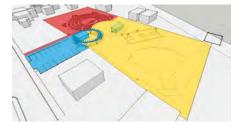
Phase 1- Community garden \$125,000-\$130,000



Phase 2-Sports fields \$90,000-\$100,000



Phase 3-Community center and drop off \$90,000-\$100,000



Phase 4-Outdoor stage \$90,000-\$95,000

Schoolyard: Phasing for the schoolyard was determined based on its immediate functional impact and cost. First, the outdoor classroom is proposed to be installed. Once complete can immediately be used for educational purposes. Second phase involves the kindergarten and 1st grade area. This will allow for some play structures to remain and be used while the second phase area is installed. The third area to be installed is the 2nd and 3rd grade area. The final phase is the installation of the rain garden, observation deck, grass drifts, and stream shaped wildflower cuts rounding up the completion of the schoolyard.

Annex Park: The phasing for the Annex also primarily focused on the functional impact of each phase. Phase one is the educational community garden. Phase two consists of spaces designated for sports activities. This is for the purpose of drawing interest to the park complex. Phase three for the annex is the rehabilitation of the existing building into the Community Center, integrating a drop off and improved parking space. The final phase of the installation is the addition of the outdoor stage located at the center of the open lawn.

Total Cost Estimate-\$780,000-\$830,000

Stephanie Redeagle



Goals

The project goal was to create a schoolyard and park which utilizes sustainable concepts to develop an educational and recreational environment for the school and the community.

Objectives

- Install plants that have color, smell, and texture (possibly edible) to get children more involved and interested in plants
- Create areas that attract indigenous, interesting wildlife
- Create a place that allows the children to use their imagination and discover new things
- Bring the community together and teach them about the importance of plants
- Incorporate more play equipment in the schoolyard
- Give the community and the school a park, which can be utilized for outdoor events and
- Give Bordentown a sense of place, identity and pride

Design Concept

The main concept of the design was to incorporate the Native American history of Bordentown – the Lenni Lenape tribe. The theme was carried through in multiple details of the site, starting with a main axis in the schoolyard that had a focal point of a totem pole, leading to an outdoor classroom that was arranged to be a "council ring." A main portion of the site was designated to be what was called the "Wigwam Village" which acted as the creative play section for the students. In this vegetated, somewhat forested area, wigwams were placed in the area for children to explore. In addition, statues and interpretive signage about the local culture are placed along the pathways to educate not only the students, but any visitors to Clara Barton. This design is used to inform the public about a small segment of the history of the Native inhabitants of the Bordentown area. There are two overall design concepts for the schoolyard and annex. The schoolyard design is to have a very axial arrangement. The axes organize the schoolyard into particular areas and functions. The annex emulates the geometry of circles that intersect on two axes and create a radial arrangement for the planting beds.

Master Plan Crosswicks St. School Main Entrance Teacher's parking area Student planting beds Hopkinson Mural Clara Barton Elementary School Outdoor classroom Chiller Secondary Entrance Sensory planting beds Trellis and Asphalt area for line-up seating area and activity Wigwam Village: 3 wigwam struc Open green space undulating stepping E. Burlington St. Playground area: 2-seat swing shrub masses to West St. 2 log tunnels uncreate intimate dulating stepping spaces logs cultural statues 2 built play interpretive signage structures 1 free-standing Secondary Entrance climbing structure schoolyard Entrance/ Main Axis Walk: painted asphal Annex parking lot Rain garden Vehicular turn-around Shed and drop-off area Monuments Planting beds: edibles Fountain Visitor pavilion Planting beds Basketball Court area

Perspectives

View 1: Entrance Walk

This is a view from the main schoolvard entrance on E. Burlington Street looking toward Clara Barton Elementary. The view is showing the open green space for active play. In the background lies the outdoor classroom with colorful plants.





View 2: Wigwam Village

This is a view looking into the Wigwam Village. The Village is a creative and learning garden with statues and signs to teach the children about the Lenni Lenape culture which is the theme of the garden.





View 3: Annex Pavilion

This is a view looking south into the Annex toward the pavilion. The pavilion features a fountain, shade structures, tables and chairs, and lighting surrounded by shrub arrangements.





Phasing & Cost Estimates

Phase 1: Playground Reconstruction



The idea behind Phase 1 is to redevelop the Active Play area of the schoolyard. The existing play equipment will be replaced with new structures along with additional elements of interest, such as the play logs, to add character to the schoolyard.

Pricing Estimate:

Surfacing:	\$1	12,500.00
Play Equip:	\$ 4	45,000.00
Vegetation:	\$	200.00
Furnishings:	\$	2,000.00
Materials:	\$	700.00
Total:	\$16	50 400 00

Phase 3: Wigwam Village



Phase 3 introduces the creative play area and more vegetation. This area will be an interesting place for the students and visitors to experience. It will serve as a learning tool for the children to understand more about the cultural background of Bordentown.

Pricing Estimate:

Surfacing:	\$ 39,200.00
Vegetation:	\$ 5,000.00
Furnishings:	\$ 600.00
Materials:	\$ 6,000.00
Total:	\$ 50 800 00

Phase 5: Community Garden/Pavilion Phase 6: Recreation Areas



Phase 5 focuses on community interest. A community garden is added to the annex along with a pavilion and shade structures for visitors' comfort. Throughout the annex, seating will be provided along the pathways.

Pricing Estimate:

Surfacing:	\$ 27,000.00
Vegetation:	\$ 9,000.00
Furnishings:	\$ 31,000.00
Materials:	\$ 30,000.00
Total:	\$ 97 000 00

Phase 2: Designating Paths and Spaces



Phase 2 of development begins to outline the primary circulation and designated areas of the proposed schoolyard. This phase introduces the outdoor learning area while maintaining the open spaces at the school entrances.

Pricing Estimate:

Surfacing:	\$17	17,200.00
Vegetation:	\$	900.00
Furnishings:	\$	400.00
Materials:	\$	3,000.00
Total:	\$12	21 500 00

Phase 4: Annex Connection/Parking



Phase 4 begins the redesigning of the annex area. The parking lot was the first to be redesigned because of its connection between the school and the annex. The parking lot will include a vegetative island, a sidewalk on both sides of the lot, and a turn around, dropoff area.

Pricing Estimate:

Surfacing:	\$ 80,000.00
0	,
Vegetation:	\$ 600.00
Furnishings:	\$ 400.00
Total:	\$ 81 000 00

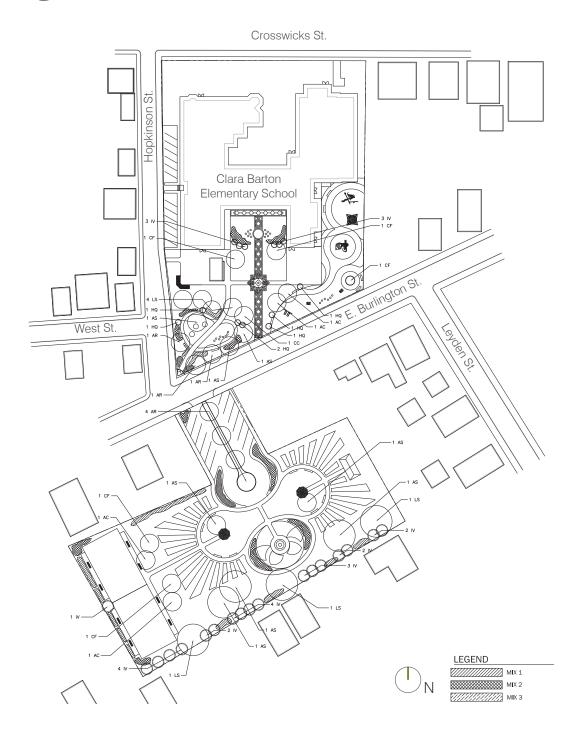


Phase 6 is the final phase. The baseball field is replaced with two new basketball courts. These courts can be used by the school and the neighborhood and serve as a designated area just for sports.

Pricing Estimate:

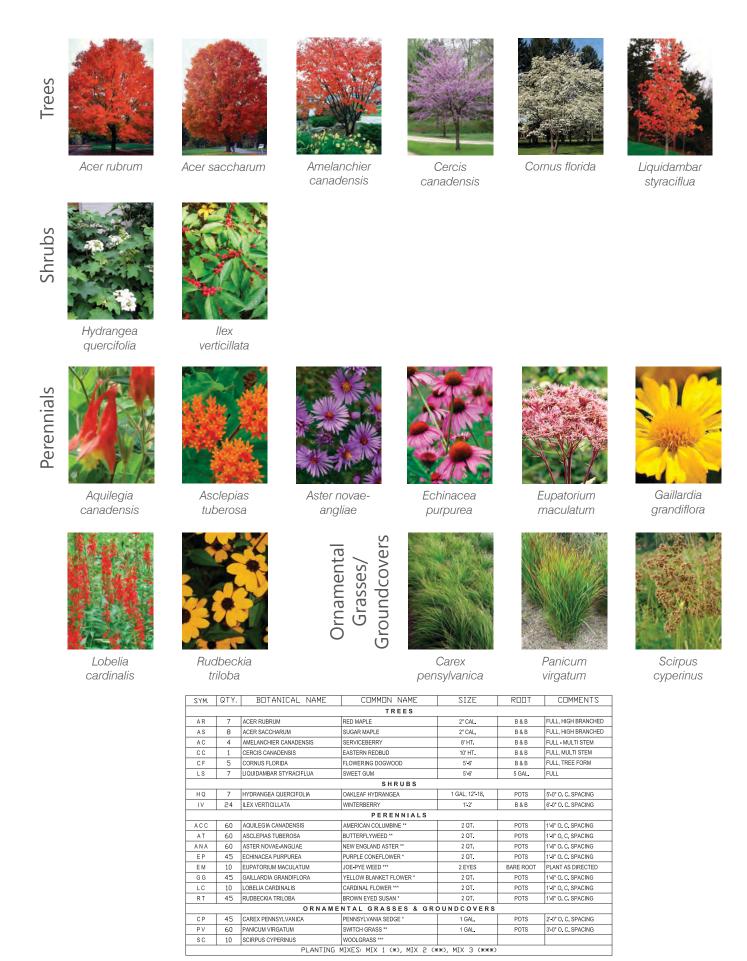
Surfacing:	\$ 40,000.00
Vegetation:	\$ 1,900.00
Furnishings:	\$ 2,000.00
Total:	\$ 43.900.00

Planting Plan

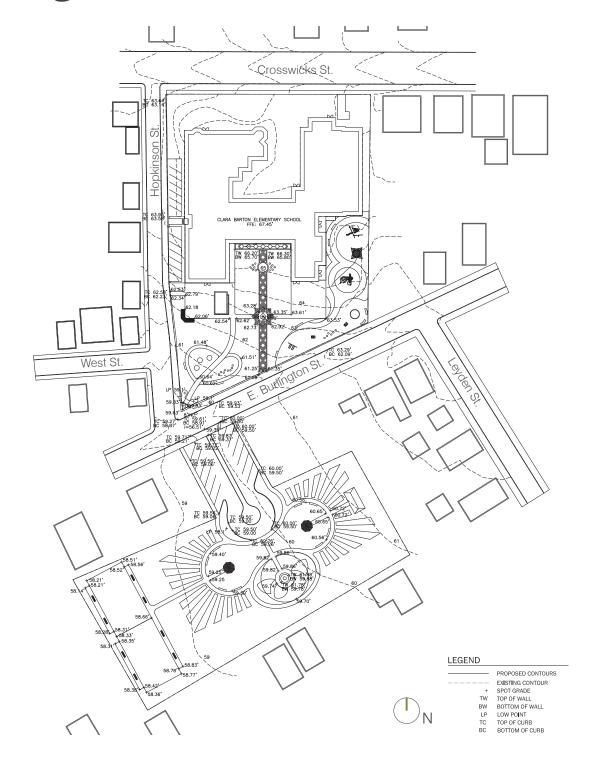


Planting Concept

- The main concept was to get young students more interested and involved in plant material. The plant palette was carefully selected to create biodiversity and incorporates a wide variety of native plantings.
- Specific plants with brilliant colors were placed for seasonal interest as it attracts and supports indigenous wildlife.
- The plants selected support the design concept. Plants such as the sugar maple, were chosen to show the importance of the vegetation and how it provides an edible supplement, just as many plants do.



Grading Plan



Grading Concept

The grading plan generally works with and maintains most of the existing contours. The main changes were the low points created for the rain gardens, which would require some cut, along with some additional cut being done in the parking lot of the annex to straighten a contour. Spot elevations were added to delineate high and low points. Existing contours remained the same with a practically flat grade of 0.7 - 1% slopes in the annex and 2.5 - 3.5% in the schoolyard.

Sections & Elevations

Section A-A'



Wigwam Village

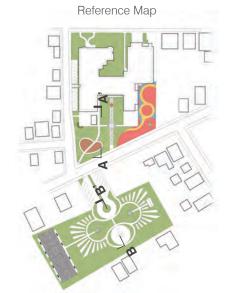
Open space

Trellis

Chiller

Clara Barton Elementary

ABOVE: Section A-A' shows the schoolyard looking west. It illustrates relationship between new vegetation and the new building structures in relation to the scale of people.



BELOW: Elevation B-B' shows the annex park looking west. It indicates the design elements and the spacing and relationship between them. It illustrates how circulation might work and the convenience of the proposed dropoff area from the parking lot.



Pavilion

Gazebo

Drop-off

Parking lot

Ernest M. Ruzicka



Goals

Transform the schoolyard and annex of Clara Barton Elementary into an ecologically sound environment with sustainable features that will provide opportunities for recreation, education and community building.

Design Concept

- The schoolyard design consists of five places that represent different human and natural, ecological communities: each surface is a different color.
- The annex is divided by two axes into four quadrants: the parking lot, community garden, playground, and multi-use area (lawn, pavilion, rain garden, and visitor center).

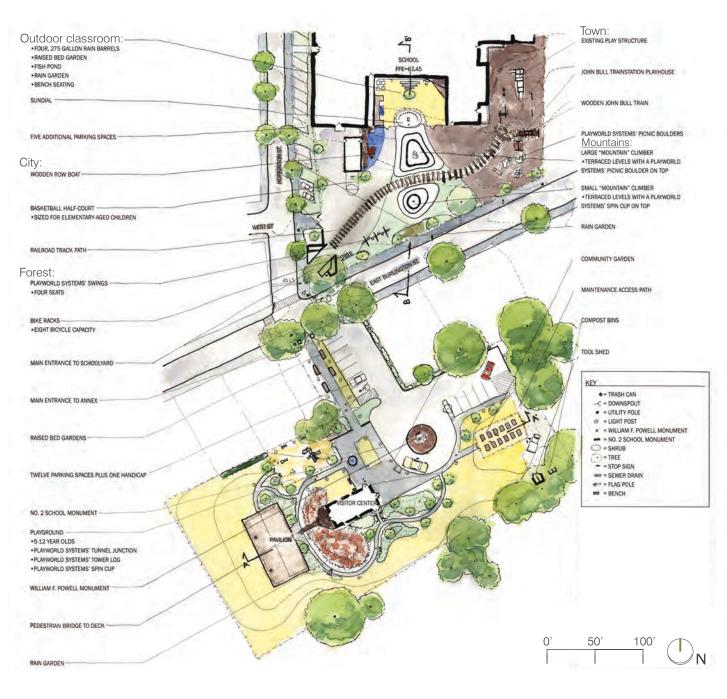
Five Places of The Schoolyard

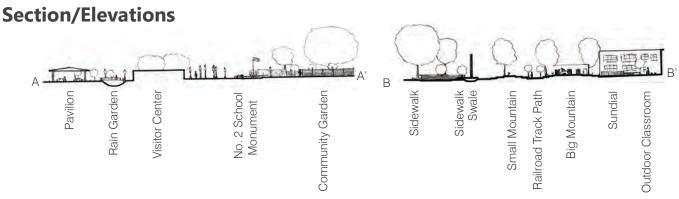
- City: Arc-style bicycle racks provide a safe place for students and faculty to put their bicycles when riding to school. The smaller basketball half-court and an eight-foot high rim, is designed to encourage children to focus on game techniques rather than running up and down a full court. The chiller structure area, is painted to look like a boathouse with a dock and a row boat in the "water," provides an opportunity for creative play.
- Outdoor classroom: Raised bed gardens, a small fish pond, rain harvesting containers, human sundial, and bench seating under a shade tree, provide many opportunities to
- Mountains: Central to the design are terraced levels made of concrete and covered in rubber surfacing. They provide a teaching tool about topography and reward those who climb to the top, with going for a spin in the spin cup or a visit to the cave in the picnic boulder.
- Forest: The swings, trees, and a small rain garden are situated next to the mountain, lending to a simulated valley experience.
- Town: The John Bull Train has just pulled into the station (a small train station play house) next to the existing play structure, and balance beams.

Design Elements

- <u>Circulation</u>: In the schoolyard, train tracks painted on asphalt create the main path. It meanders through the mountains and terminates at the John Bull Train, a wooden, creative
- Shade: Trees are planted along the southern edges of several places througout the schoolyard and annex, designed to not shade out any gardens or the sundial.
- Active environments: Children can balance, spin, swing, or climb in the active environments
- Safety: Except for the mountains, "City" area and train track path in the schoolyard, all other areas of the schoolyard and the annex playground will have a 6" depth of SoftStuff™/ Pour&Play™ from EcoGreen with a heavy-duty slit-film woven fabric, like Mirafi® 500X, to prevent the loose-fill from pushing into the dirt. This will reduce the likelihood of injuries from falling. Additional stop signs on E. Burlington St. and a relocated crosswalk, help to make pedestrians more visible to vehicular traffic.
- Historical: The No. 2 School monument and the William F. Powell monument are relocated to the visitor center area where they have a more prominent position.
- Stormwater BMPs: Loose-fill surfacing, rain water storage in, 275-gallon IBC containers, rain gardens and additional trees, work together to reduce stormwater runoff.

Master Plan





Perspectives



A. Main Entrance to School



B. Outdoor Classroom

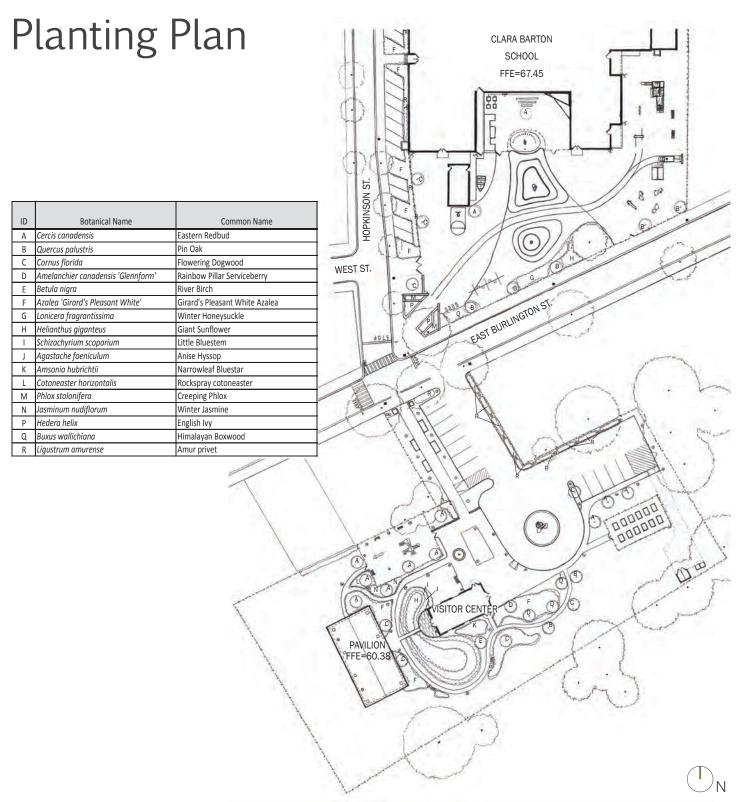




C. Visitor Center & William F. Powell Monument



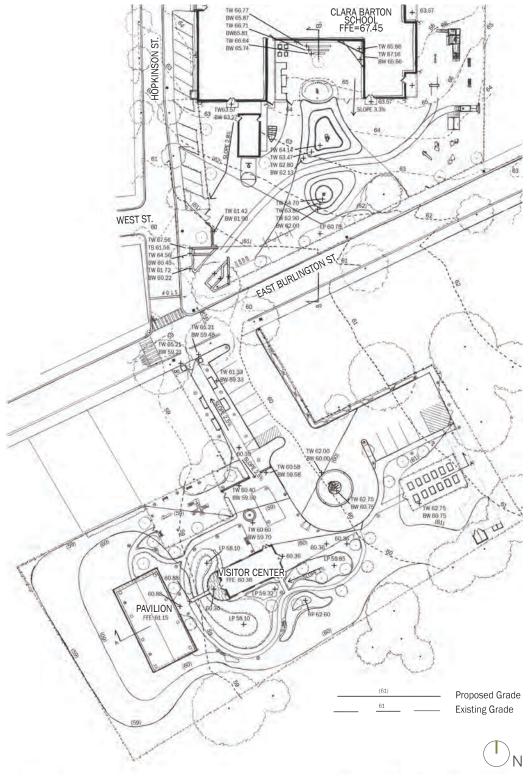
D. No. 2 School Monument



Planting Concept

- Safety is maintained by keeping sight lines open for traffic/pedestrian movement.
- Sustainable choices are reflected in the selection and placement of low-maintenance and salt-tolerant plant species.
- Four-season interest is provided; several of the plants offer winter interest by their foliage, bark, flowers, or fragrance. During the fall, grasses provide texture to the annex's rain garden. In the spring and summer, many flowers are in bloom.
- The rain gardens permit stormwater infiltration and help cleanse the water by removing contaminants. In the annex, the rain garden is large enough to provide a suitable habitat for wildlife. This creates educational opportunities to teach children about ecology and the hydrologic cycle.
- Trees are used mainly for shade, but also help to calm the experience of walking on the paths or sitting on the benches and walls.

Grading Plan



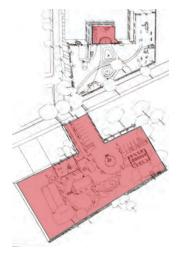
Grading Concept

- The proposed grade for the schoolyard and annex are both near 2.5%.
- ADA accessible routes are provided throughout.
- Mounds were required to create positive drainage into the rain garden of the annex due to the flatness of the existing grade.
- About half of all stormwater from the annex enters the rain garden. This helps to offset the stormwater infiltration ability lost by enlarging the parking lot.

Phasing & Cost Estimates

Phase 1

•	Outdoor Classroom	\$15,000
•	Re-grade Annex	\$ 8,000
•	Pavilion	\$25,000
•	Community Garden	\$ 5,000
•	Estimated Total Cost	\$53,000



Phase 2

•	Remainder of schoolyard	\$60,000
•	Main Entrance to Annex	\$25,000
•	Annex Parking Lot	\$63,000
•	Estimated Total Cost	\$148.000

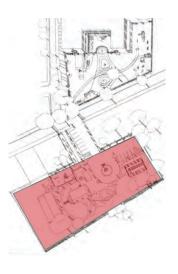


Phase 3

•	Visitor Center	\$40,000
•	Remainder of annex	\$30,000
•	Estimated Total Cost	\$70,000



Estimated Project Total: \$271,000 This phasing plan will create an efficient construction process while minimizing disturbances to neighbors.





*Not to Scale

Christopher S. Sohnly



Goals

Transform Clara Barton Schoolyard and Annex into an environmentally sustainable schoolyard and community park that encourages environmental education and active as well as creative play.

Objectives

- Remove impervious paving in areas of the schoolyard as appropriate
- Develop best management practices for stormwater management and incorporate artful rainwater designs
- Incorporate native plants that provide shade, stimulation of five senses and a range of ecotypes
- Develop learning gardens within the schoolyard site and a community garden at the annex
- Incorporate play structures that allow for active and creative play that enhances physical, mental and emotional well being

Design Concept

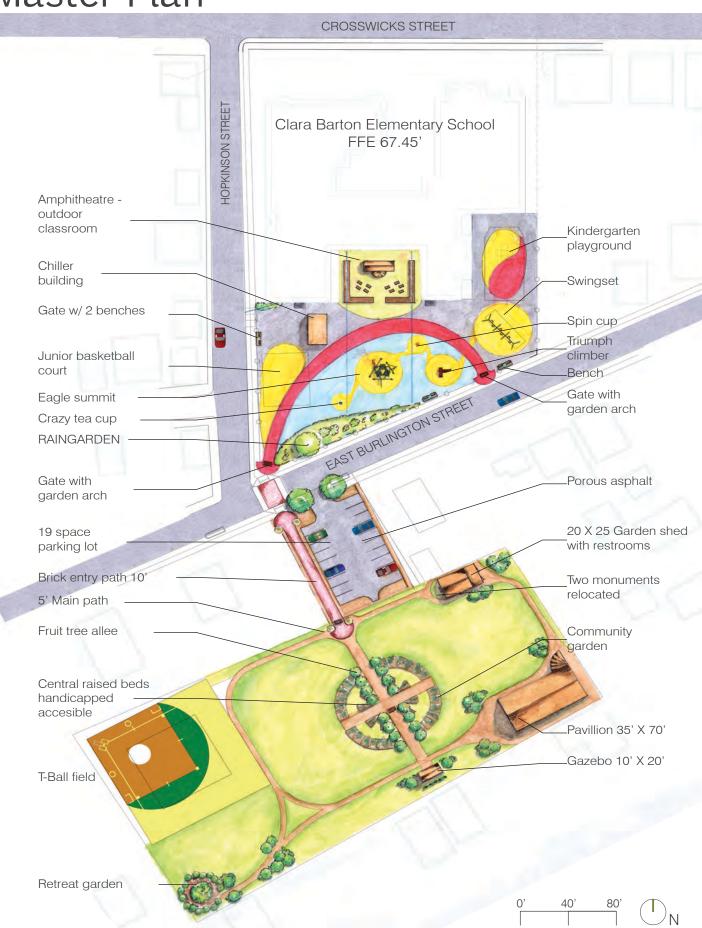
he central idea in this design is to create a direct connection between the Clara Barton Schoolyard and the Annex. The central idea is accomplished in the hardscaping elements by aligning the main gate in the schoolyard with the entry walk into the Annex. The design also alters the crosswalk to make it more visible to drivers and safer for pedestrians. Using brick in the crosswalk and the path into the Annex further reinforces the connection. All entrances are framed with garden arches to create an identity for the school.

The goal of reducing asphalt is accomplished by creating a rain garden, and renovating the parking lot in the Annex area, which will be paved with porous asphalt. In the Annex, the main paths will be paved with porous asphalt which will allow infiltration and also allow access to all individuals to all areas of the park.

A central active play area is composed of playground equipment purchased from Playworld Systems, Inc. These would include a traditional swing set, with a combined central structure, Eagle Summit, that provides climbing and slides, supplemented by a smaller climbing structure Triumph Climber, for younger children.

Community garden beds are located in the center of the Annex, with raised beds for access by seniors or others with special needs. To further enhance a sense of identity for the community there is a 35' x 70' pavilion.

Master Plan



Perspectives



Looking North into Clara Barton Schoolyard Courtyard with amphitheater, raised beds, and artful downspouts.

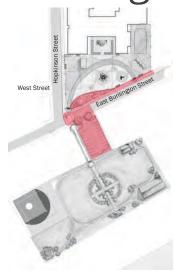


Looking southeast in annex with addtion of pavilion, porous asphalt path, and shed.



Looking South in Annex with Community Garden, raised beds, and garden arches.

Phasing & Cost Estimates

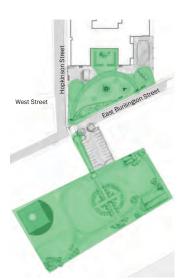


PHASE 1 - STORMWATER

Beginning with the removal of the existing fence along East Burlington Steet and excavation to create a rain garden, Phase 1 addresses the ponding that occurs in the intersection of East Burlington Steet and Hopkinson Street.

In addition, replacing the existing impervious paving in the parking lot adjacent to the annex with pervious asphalt the area will allow for significantly more infiltration of stormwater. The rain garden will also serve as the first step toward creating an ecological schoolyard, using the roof drainage as an amenity.

Plants	\$7500 - \$10,000
Materials	\$12,500 - \$20,000
Labor	\$10,000 - \$15,000
Total	\$30,000 - \$45,000



PHASE 2 - PLAYGROUND

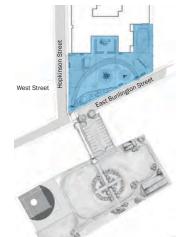
Resurfacing the existing asphalt and adding new equipment will mark the second phase. Installing new pour-in-place color rubber at required fall heights will add safety to the playground. The addition of an amphitheater and benches for outdoor events will broaden the range of uses. Artistic downspouts and raised beds will serve as artful rainwater educational elements to engage the students in ecological processes.

\$1,500 - \$3,000
\$115,000 - \$150,000
\$36,000 - \$45,000
\$10,000 - \$20,000
\$126,500 - \$209,000

ANNEX_

This phase is focused on creating a community garden complex in the annex. Installing a pourous asphalt path system will allow for universal access. A path system will facilitate the operation of the community garden and provide easy access to all areas of the annex. The addition of a 35' x 70' pavilion, a 20' x 25' garden shed and garden arches will further enhance the amenity of the annex.

Plants	\$3,000 - \$5,000
Materials	\$100,000 - \$150,000
Pavillion, Shed, Garden Elements	\$75,000 - \$150,000
Labor	\$20,000 - \$30,000
Total	\$198,000 - \$335,000
IUIdi	φ190,000 - φ333,000

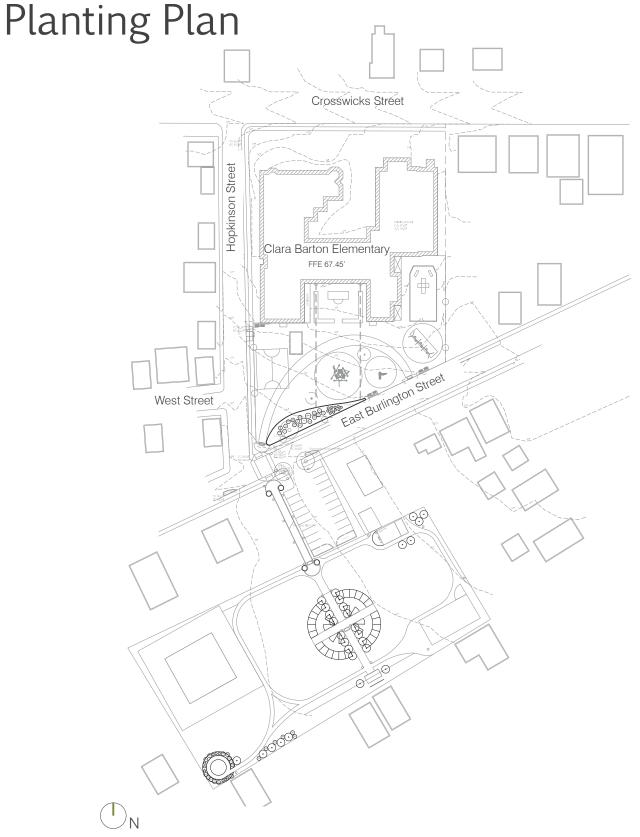


PHASE 3 - REMOVAL OF ASPHALT

REMOVAL OF ALL ASPHALT

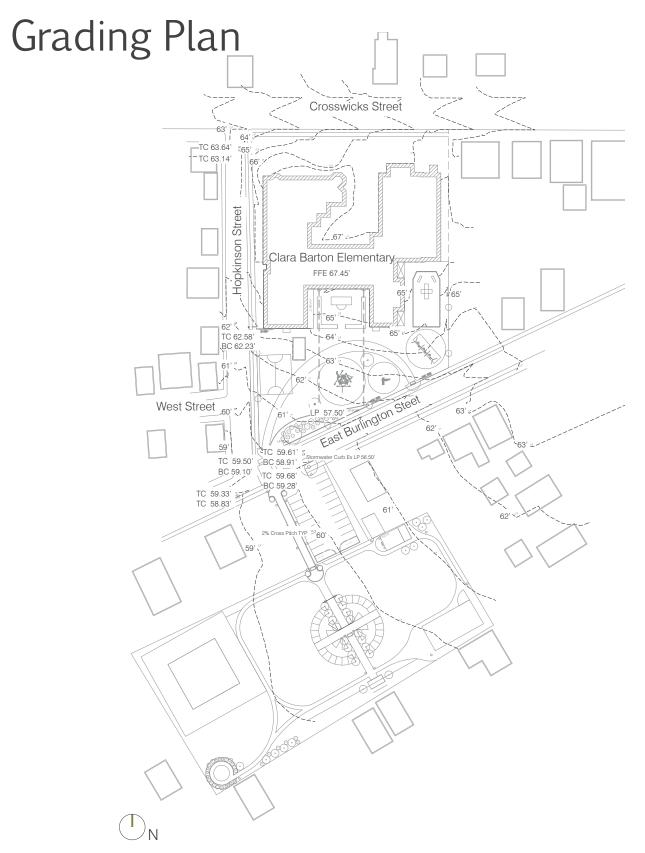
The third phase of the renovation process will be the complete removal of all the asphalt in the Clara Barton schoolyard. This process will require thorough soil testing and careful engineering consideration. The schoolyard was previously part of West Street so the underlying soils may be compacted and require removal to a significant depth to allow infiltration and installation of more plant material. It would also require the removal of the installed pour-in-place rubber.

Plants	\$7500 - \$10,000
Materials	\$250,000 - \$500,000
Labor	\$100,000 - \$250,000
Total	\$357.500 - \$760.000



Planting Concept

Plant choices were guided by "Plant Communities of New Jersey" by Collins and Anderson. The area is considered Inner Coastal Plain and the president area is considered Inner Coastal Plain and the precise area of the school is Upland. Choices for the rain garden are upland plants that can tolerate wet soils but are fine in moderate conditions. The tree choices, Atlantic white-cedar, Pitch pine, and Sweet-bay magnolia are classic New Jersey plants that will create an identity for the area and allow teachers to educate students about the native plants.



Grading Concept

Members of the Parent-Teacher organization had indicated that they might be able to obtain grant funding for stormwater management. Addressing the ponding at the corner of East Burlington and Hopkinson Streets was the main focus of the grading and stormwater management plan. The rain garden in the south corner of the schoolyard would require grading and excavation, as would the redesign of the intersection and resurfacing of the parking lot across East Burlington Street with porous asphalt.

Michael Swercewski



Goals

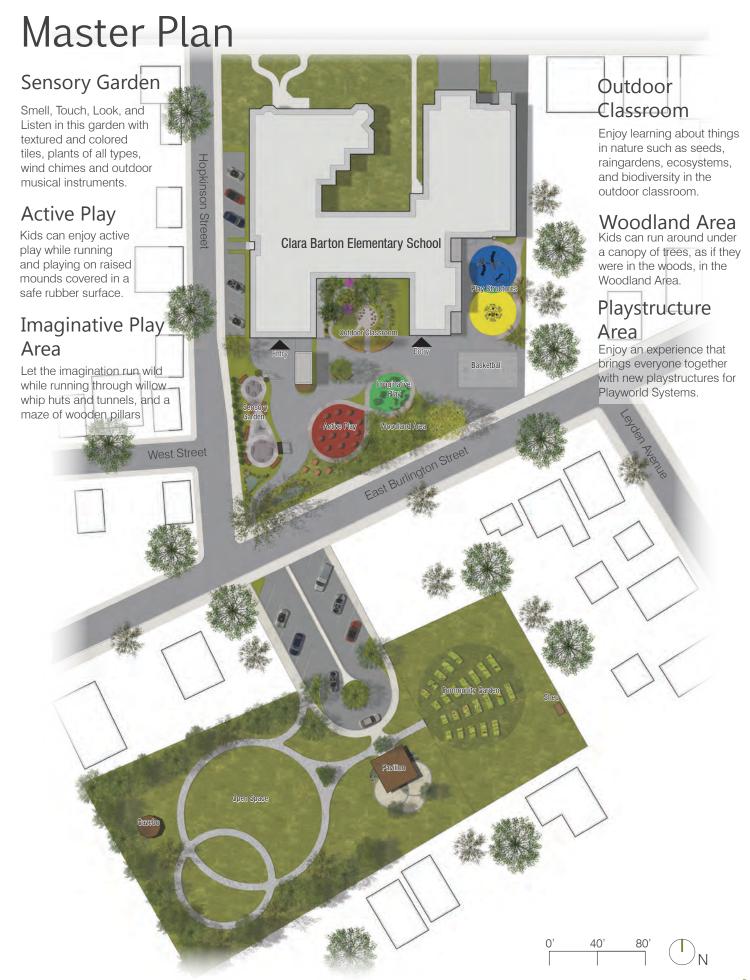
To create an Ecological Schoolyard at Clara Barton Elementary School that can serve as a place for recreation and education.

Objectives

- Incorporate Green Infrastructure
- Incorporate Best Management Practices
- Integrate Landscape Plantings
- Incorporate Play Systems

Design Concept

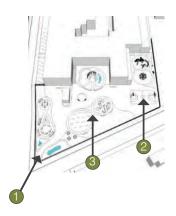
- This design focused on creating separate areas of play that worked to thread together a complete and cohesive playground for Clara Barton Elementary School. Within the schoolyard there are six distinct areas. The Educational area, the Sensory Garden, the Active Play Area, the Imaginative Play area, the Woodland Area, and the Playstructure area.
- The Education area consists of a rain garden which collects water from the roof, a woodland area with fern understory, as well as understory shrubs, and an urban meadow. The area contains an outdoor classroom with seating as well as an overhead structure for shade.
- The Sensory Garden is just that, a garden for your senses. The garden contains walls that have different colored and textured tiles, a sound pole with wind chimes, a variety of plants that are interesting to the touch, smell and sight, a small water fountain and an area for musical instruments.
- The Active Play area consists of playful mounds that kids can run around and over that is covered by a safe rubberized material.
- The Imaginative Play area has willow whip huts and willow whip tunnels that the kids can round around in and a maze created by varying heights of wood pillars.
- In the Woodland Area, children can run around under a canopy of trees and fallen logs just like the woods.
- The Playstructure Area has two new play scapes from Playworld Systems, Eno and Skyscape.
- The parking lot in the community park has been redesigned. A circular turn-around has been added with drop off area. An open air pavillion with a patio in the back has been added for community gatherings and parties.
- The community garden with a shed has been placed on the eastern side of the site. This garden has varying size plots depending on what people want to grow.
- On the Western side of the site, there is a new lawn with two intersecting paths that people can use. There is also a gazebo that is located just off the path that people can utilize.
- The openspace "park" side to the site has been lined with trees to create shade and a sense of enclosure.



Perspectives



1 - Looking Northeast From the Main Entrance





2 - Looking North into the Playscape Play Area



3 - Looking North into the Outdoor Classroom



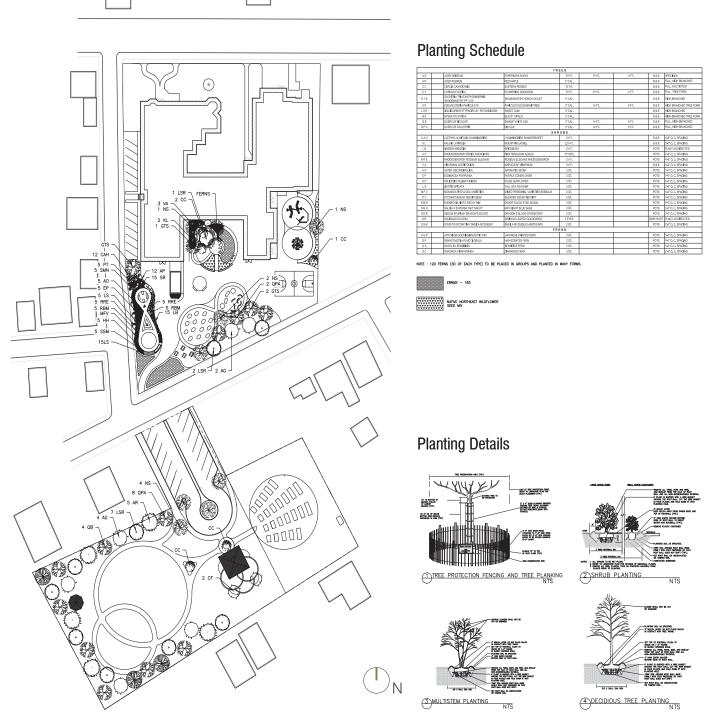
1 - Looking Southeast towards Community Garden





2 - Looking Northwest into the Open Space

Planting Plan



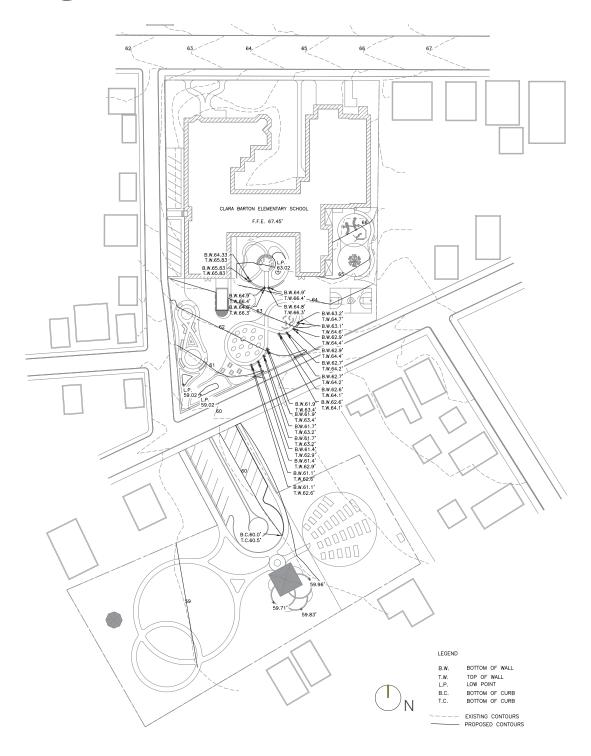
Planting Concept

The planting concept was based off of the design concept which focused on creating separate areas that worked to thread together a complete and cohesive space. The trees, shrubs, and perennials that are in the Sensory Garden were specifically chosen for texture, scent, color and form, which all appeal to the senses. In the educational area, all the trees, shrubs and grasses were chosen for their educational purposes. Trees and

shrubs that seed, grasses that represent a meadow and plants that are meant for raingardens.

The trees in the woodland area were chosen for their form, color and additionally their ability to provide shade. A variety of trees were chosen for diversity. The plants in the Playstructure area were designed to soften the border between the schoolyard and the adjacent property, and to provide shade.

Grading Plan



Grading Concept

The overall slope of the playground is about 2.5%. The grading plan maintains the grade the same thoughout the site, with the exception of the raingardens, the mounded play area, seating walls, and swale.

The overall grade in the community park is about .5%. Due to the extremely flat topography, the goal again, was to maintain the existing grade. The major exception to this area was the expansion of the parking lot.

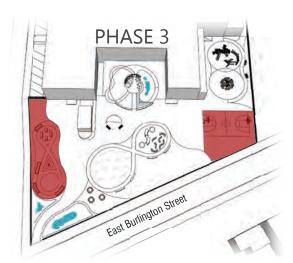
Phasing & Cost Estimates



With the installation of the rain gardens, the school would gain recognition as an ecologically friendly school. This would also start removing pointsource pollutants and reducing stormwater runoff. This portion of the schoolyard is proposed to be constructed first.

Cost Estimate

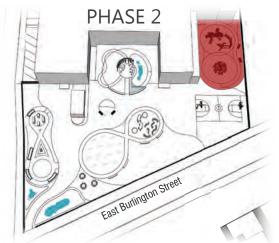
Plants - \$1,500 - 2,500 Materials - \$7,000 - 8,000 Labor - \$20,000 - 24,000 TOTAL - \$28,500 - 34,000



Installation of the sensory garden on the west side of the playground will be done while at the same time, relocating and upgrading the basketball court. The sensory garden will act as an educational piece and also a passive play area. This will be the third installment in the phasing plan.

Cost Estimate

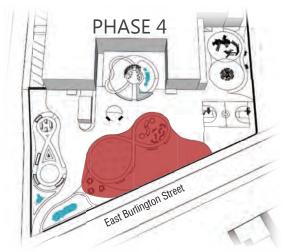
Plants - \$2,000 - 3,000 Materials - \$2,500 - 3,000 Equipment - \$12,500 - 15,000 Labor - \$14,000 - 20,000 TOTAL - \$31,000 - 41,000



The children can start to utilize the benefits of new and diverse playground equipment. It will also give the school some time to gain the funding for the new play equipment. The proximity to the school makes this the ideal second step to take. This part of the project is proposed to be second.

Cost Estimate

Plants - \$700 - 1,000 Materials - \$11,000 - 12,000 Equipment - \$39,500 - 42,000 Labor - \$80,000 - 100,000 TOTAL - \$130,000 - 150,000



The new imaginative and active play area in the center of the schoolyard will complete the new eco-schoolyard at Clara Barton Elementary School and allow the students to enjoy the schoolyard as a whole.

Cost Estimate

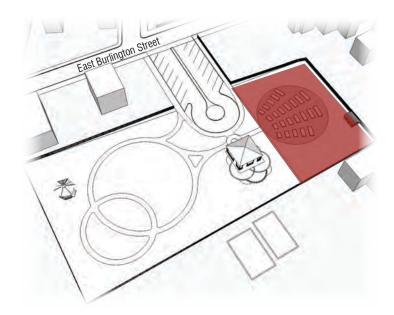
Plants - \$18,000 - 24,000 Materials - \$17,500 - 20,000 Equipment - \$500 - 900 Labor - \$70,000 - 80,000 TOTAL - \$100,000 - 130,000

PHASE 1 COMMUNITY GARDEN

Installing the community garden which will bring people together from the neighborhood and strengthen the reason to develop the remainder of the

Cost Estimate

Materials - \$6,000 - 8,000 Labor -\$14,000 - 20,000 TOTAL -\$20,000 - 28,000

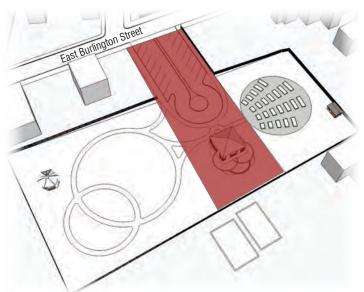


PHASE 2 COMMUNITY PAVILLION & PARKING

Building the community pavillion and upgrading and expanding the parking lot. This will add to the experience of the garden by allowing better access and a place for gatherings.

Cost Estimate

Plants -\$2,000 - 3,000 Materials -\$50,000 - 60,000 Labor -\$14,000 - 20,000 TOTAL -\$150,000 - 160,000

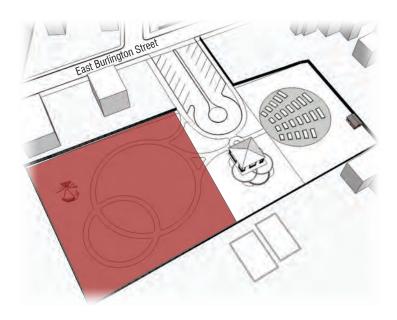


PHASE 3 COMMUNITY PARK

Creating the community park so all will be able to enjoy the space.

Cost Estimate

Plants -\$2,000 - 3,000 Material -\$12,500 - 15,000 Labor -\$40,000 - 45,000 TOTAL -\$54,000 - 63,000



FINAL MASTER PLAN

Summary

At the completion of the master plan design phase, the members of the P.T.O. reviewed the 13 master plans. They found design features in every plan that met the goals and objectives of the project. After much discussion and having to select only one final master plan, they chose Michael Swercewski's master plan and requested that features from several other designs be consolidated into one final master plan. Stephanie Redeagle assisted with the design detail of the courtyard space.

Temple University students are pleased to have assisted Clara Barton Elementary School in providing the initial designs. As the project moves forward, it is their hope that their efforts will serve as a springboard for further design development by design professionals, as a fund raising tool, and as a model for other schools.

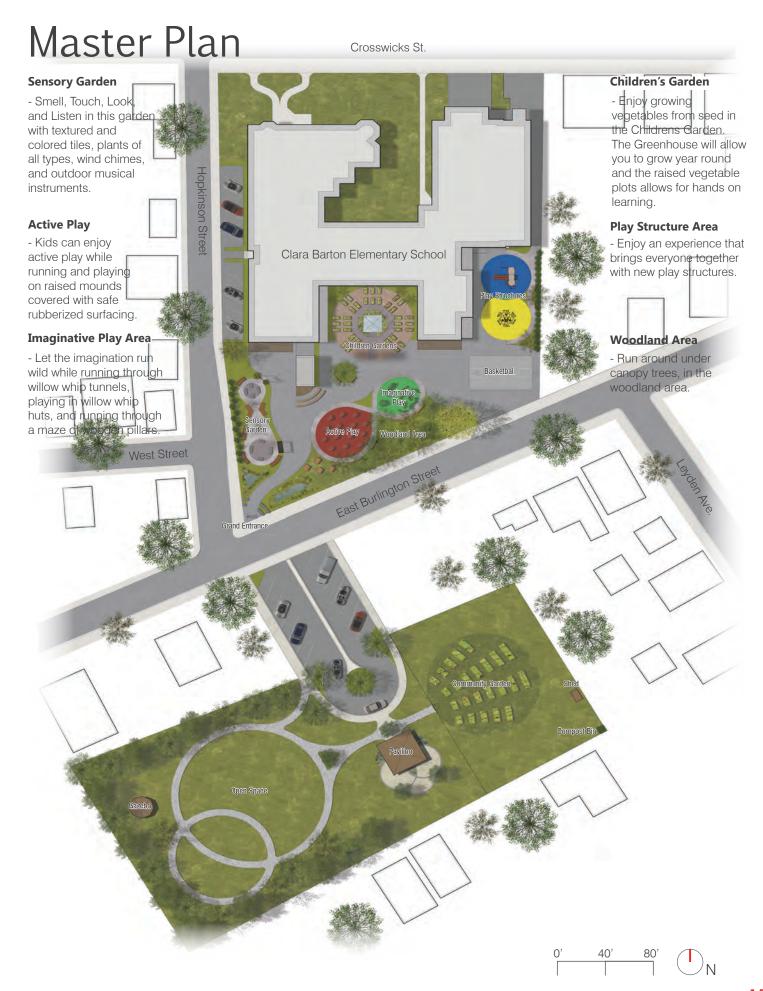
Design Phase

Michael Swercewski Stephanie Redeagle

Design Concept

This design focused on creating distinct areas of play that wove together to create a cohesive playground for Clara Barton l Elementary School. Within the schoolyard there are six distinct areas. These include, the Childrens Garden, the Sensory Garden, the Active Play Area, the Imaginative Play area, the Woodland Area, and the Play Structure area. The Childrens Area, consists of a central greenhouse, raised plant beds, seating, and rain barrels that collect water from the roof downspouts. The Sensory Garden is a garden for the senses. This garden contains walls that have different colored and textured tiles; a sound pole with wind chimes; a variety of plants that are interesting to the touch, smell and sight; a small water fountain and an area for musical instruments. The Active Play area consists of playful mounds that kids can run in that is cushioned with safe rubberized material. The Imaginative Play area has willow whip huts and willow whip tunnels that the kids can round around in and a maze created by varying heights of wood pillars. In the Woodland Area, children can run around under a canopy of trees and fallen logs just like the woods. The Play Structure Area has two play structures, the existing play structure and a new geodesic dome.

The parking lot in the community park has been redesigned. A circular turn-around has been added with drop off area. An open air pavillion with a patio in the back has been added for community events. The community garden with a shed is located on the eastern side of the site. This garden has varying size plots for flexibility. On the western side of the site, a new lawn with two intersecting paths allows for a short or long walk.



Perspective



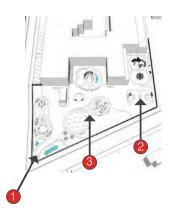
The proposed Children's Garden is located in the current courtyard in Clara Barton's schoolyard. A 15'x15' greenhouse is on axis within the courtyard. The 3'x 6' plant beds are layed out in a radial pattern from the greenhouse. A six foot wide pathway surrounds the greenhouse and separates it from the planting beds. The planting beds are placed on each side of the octagon shape, with the exception of the entrance side. Plots placed were designed to be 3'x6'. Ivy on the fence and shrubs along the walls serve as a buffer and contribute to the aesthetics of this intimate space.



Perspectives



1 - Looking Northeast From the Main Entrance





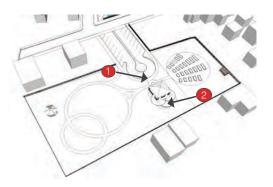
2 - Looking North into the Playscape Play Area



3 - Looking North into the Outdoor Classroom



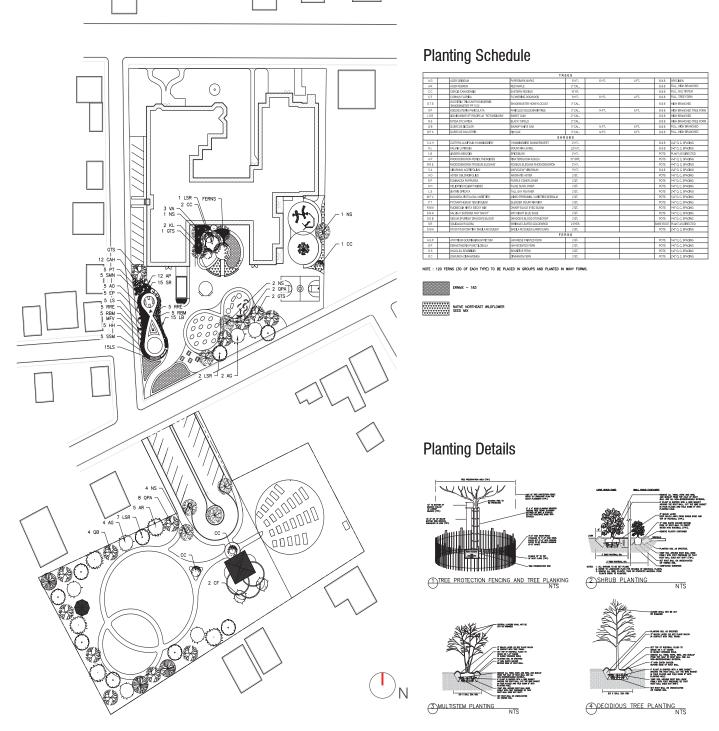
1 - Looking Southeast towards Community Garden





2 - Looking Northwest into the Open Space

Planting Plan

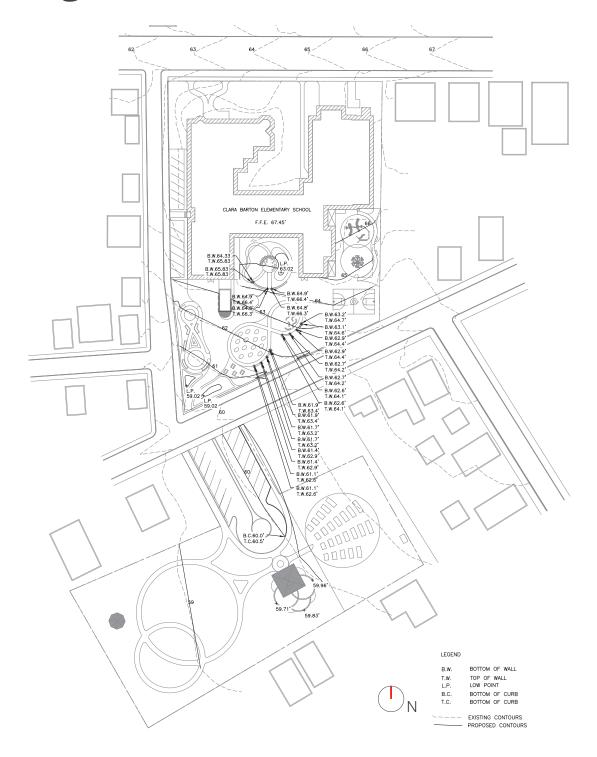


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The trees in the woodland area were chosen for the form, color and additionally their ability to provide shade. A variety of trees were chosen for diversity. The plants in the Playstructure area were designed to soften the border between the schoolyard and the adjacent property, and to provide shade.

Grading Plan



Grading Concept

The overall slope of the playground is about 2.5%. The grading plan maintains the grade the same thoughout the site, with the exception of the raingardens, the mounded play area, seating walls, and swale.

The overall grade in the community park is about .5%. Due to the extremely flat topography, the goal again, was to maintain the existing grade. The major exception to this area was the expansion of the parking lot.

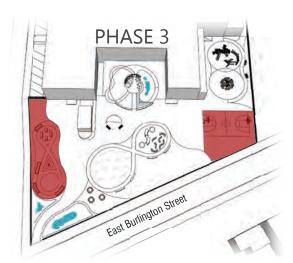
Phasing & Cost Estimates



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Cost Estimate

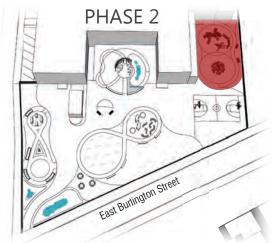
Plants - \$1,500 - 2,500 Materials - \$7,000 - 8,000 Labor - \$20,000 - 24,000 TOTAL - \$28,500 - 34,000



Installation of the sensory garden on the west side of the playground will be done while at the same time, relocating and upgrading the basketball court. The sensory garden will act as an educational piece and also a passive play area. This will be the third installment in the phasing plan.

Cost Estimate

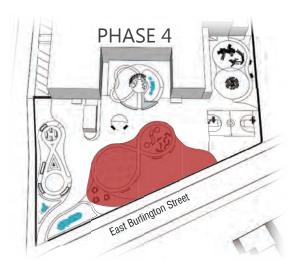
Plants - \$2,000 - 3,000 Materials - \$2,500 - 3,000 Equipment - \$12,500 - 15,000 Labor - \$14,000 - 20,000 TOTAL - \$31,000 - 41,000



The children can start to utilize the benefits of a new and diverse playground equipment. It will also give the school some time to gain the funding for the new play equipment. The proximity to the school makes this the ideal second step to take. This part of the project is proposed to be second.

Cost Estimate

Plants - \$700 - 1,000 Materials - \$11,000 - 12,000 Equipment - \$39,500 - 42,000 Labor - \$80,000 - 100,000 TOTAL - \$130,000 - 150,000



The new imaginative and active play area in the center of the schoolyard will complete the new eco-schoolyard at Clara Barton Elementary School and allow the students to enjoy the schoolyard as a whole.

Cost Estimate

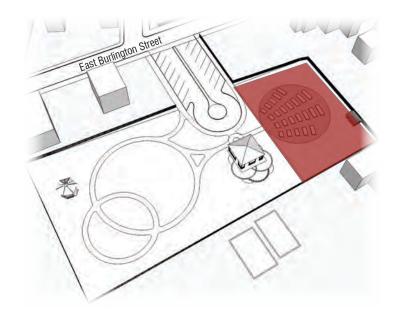
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PHASE 1 COMMUNITY GARDEN

Installing the community garden which will bring people together from the neighborhood and strengthen the reason to develop the remainder of the

Cost Estimate

Materials - \$6,000 - 8,000 Labor -\$14,000 - 20,000 TOTAL -\$20,000 - 28,000

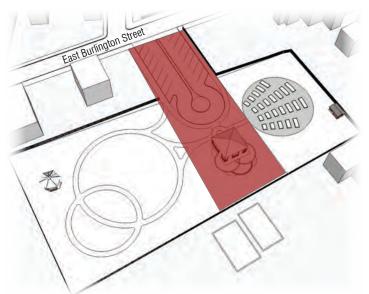


PHASE 2 COMMUNITY PAVILLION & PARKING

Building the community pavillion and upgrading and expanding the parking lot. This will add to the experience of the garden by allowing better access and a place for gatherings.

Cost Estimate

Plants -\$2,000 - 3,000 Materials -\$50,000 - 60,000 Labor -\$14,000 - 20,000 TOTAL -\$150,000 - 160,000

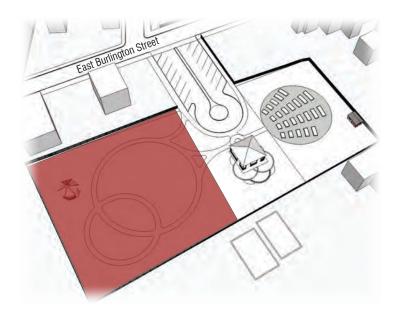


PHASE 3 COMMUNITY PARK

Creating the community park so all will be able to enjoy the space.

Cost Estimate

Plants -\$2,000 - 3,000 Material -\$12,500 - 15,000 Labor -\$40,000 - 45,000 TOTAL -\$54,000 - 63,000



CASE STUDIES

Why research case studies?

Case studies consist of contextually rich scenarios of executed projects. They offer a variety of project conditions and design solutions. They provide inspiration and serve as an important resource.

The Chinese Immersion School at De Avila



Educational Zones

The concept plan combines new learning spaces into the existing playground and incorporates ecological and curriculum oriented zones throughout the site. The main goal of the design is to re-connect children to the local, natural environment and promote the use of sustainable building practices and materials. The new schoolyard creates multiuse spaces, sparks imaginative play, softens the environment, and enables children to interact with nature on a regular basis.

Re-Connecting Children with Nature



LEFT: The "Wooly Pockets" are a great way to screen fences or bland building faces with a colorful plant wall





LEFT: The food crops garden is a place where students can grow food that will be used for their lunches.



RIGHT: The principal is enjoying an afternoon snack that she picked herself from the apple orchard.



Fairmount Elementary School

San Francisco, CA



Creative Exploration

The new site plan seeks to create schoolyard spaces that promote environmental stewardship among students, teachers, and the community as well as to provide a more natural setting for play, learning, and community gatherings. The project goal is to enrich the schoolyard additional recreational. educational, and ecological features that will make it a more exciting, beautiful, interesting, and comfortable environment, while creating a heightened experience with nature. The new schoolyard creates areas devoted to active play, exploration, nature and creative adventures.

The Enrichment of Ecology



LEFT: A "Tee-Pea" tunnel is used to grow peas and beans. It also provides students with natural play structures.



RIGHT: Low trees provide students with a natural shelter and small sense of privacy from the teachers



LEFT: A class being held in the outdoor classroom and teaching garden at Fairmount Elementary



RIGHT: Children in the "Nibbling Garden" enjoying some fresh mint they just picked

The Suneden Special School



Recycled Sensory Playground

- Designed for children with mental and physical disabilities.
- Revolves around a child's sensory perception of their surroundings.
- Built on an extremely small budget, this playground evolved from an initial request for a single piece of play equipment, to a whole hearted community effort to use recycled materials and creative graphics to develop this play
- Forces those who play here to use and develop creative, interactive, and exploitative methods of play.

ABOVE: Items such as concrete pipe, paint, rubberized surfacing, and fake turf has been used to create a sensory playscape.

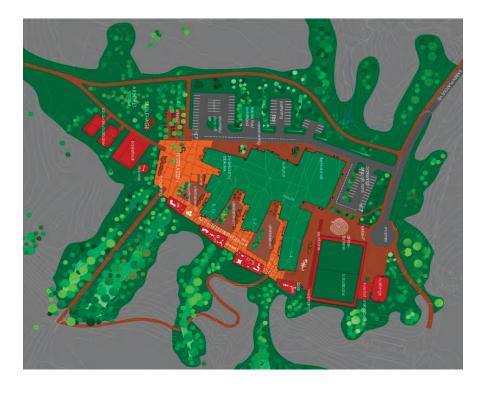
BELOW: The curved and textured play surface allows for a very interactive experience.

A Sensory Playscape!



The Rommen School

Oslo, Norway



Eco School

- Home to more then 770 children that attend grades 1-10.
- One of the key features is the presecne of 200 or more bike stalls, accommodating a large walking and biking community nearby.
- The painted graphics within the grounds of the play space encourage inventive play.

A Cultural Center



LEFT: Various play spaces available to children, and the way children interact with one another.



RIGHT: The trees seen are all labeled and incorporated within the science curriculum of the school.



LEFT: A rarely seen play feature that allows children to test their balance and coordination skills.



RIGHT: A climbing structure that allows children of all ages to find entertainment within.

The Arturo Toscanini School

Asphalt to Gardens

- Outdoor garden, greenhouse and kitchen set within the largest areas void of green space within New York City.
- 625 students that attend the school work in the garden greenhouse and kitchen as part of the core curriculum.
- First initiated by Edible Schoolyard NYC, it was funded with title one funding (Government Funding for Impoverished schools), which says a lot about the children that are using this facility.

TOP LEFT: Aerial of the school yard with garden, new greenhouse, and kitchen building.

RIGHT: A greenhouse adjacent to the garden teaches the children more about the process of growing vegetables.

BOTTOM LEFT: Permeable paving is used on most of the outdoor walkways.







First New York Edible Schoolyard

The William Dick School

Philadelphia, Pennsylvania



A Stormwater School

- A rain garden, that is the biggest of any on a public schools campus, new play equipment, a track, and a new artificial turf field.
- The outdoor play area was previously an asphalt ocean with little in the way of vegetation or stormwarter management.
- The inclusion of planting beds allows the outdoor space to become part of the school's curriculum.

RIGHT: Depicts the previous state of the school's play yard - 100% impervious!



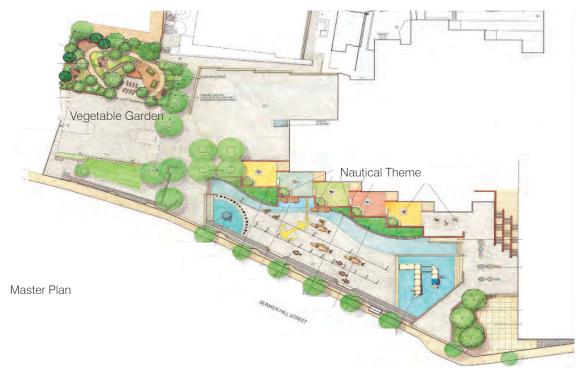
BELOW: The current school play area, incorporates storm water BMP's, new play equipment, and a turf area.



A Great Transformation

Harvard Kent Elementary

Boston, Massachusetts





Play structures



First harvest

Themed Design

- Designed by CBA Landscape Architects this schoolyard has a nautical theme.
- The goal of the project was to enhance the outdoor space and incorporate an educational garden for use by the students.
- Spaces were created outside the windows of each classroom along the northern edge of the building, affording the students within a 'room with a view'

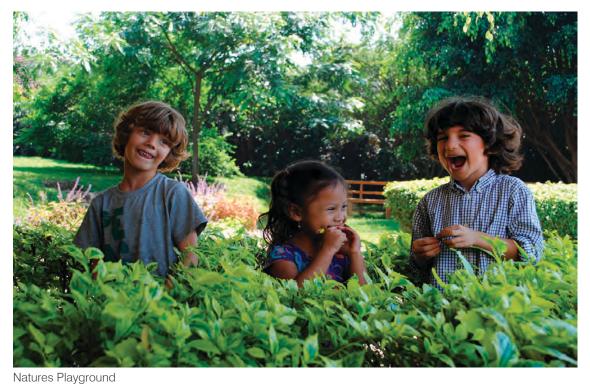


Themed asphalt

'Rooms With a View'

The Earth School

Kigali. Rwanda





Crop harvesting



Young garden tender

, ,

Natural Play

- To recognize children's academic, physical and emotional needs through a journey of selfdiscovery and growth.
- Learning at this Montessori school is amlo entirely experiential allowing for a natural child development.
- This method of teaching focuses on independence and freedom, designed to let the children enrich themselves through exploration.



Tree climbing

"The child has one intuitive aim: self-development" Maria Montessori

Turtle-rock Pre School



Master Plan

Minimal Paving

- This schoolyard is designed to enhance the learning experience for children.
- Outdoor educational areas provide for child development, growth and learning.
- Waterfalls, labyrinths, sand-pits, musical instruments and a play house all add to the wonder of this garden.

Almost 100% Pervious Surface



TOP LEFT: Living willow whip tunnel.

BOTTOM LEFT: Children playing musical instruments.

RIGHT: Many elements of play are incorporated into this small space.

4-H Children's Garden

East Lansing, Michigan



Playful Grand Entrance

Themed Design

- Michigan State University's devision of parks and planning took on the role of designing a children's garden which incorporates 56 different themed gardens and lots of interactive features.
- Incorporates design ideas by children.
- The H-4 children's garden was designed by Jeff Kacos & Deb Kinney, Landscape Architects at Michigan State University's division of parks and planning.



TOP LEFT: The top ten healthiest vegetables as rated by the USDA are grown in this children's garden

BOTTOM LEFT: Amphitheater creates a exciting learning area

RIGHT: Color can be seen in every corner of this garden



56 Individual Themed Gardens

Marin Primary & Middle School

Larkspur, California



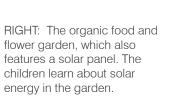
Schoolyard with Educational Play

Spring of 2014 Marin Primary and Middle School finished renovating their school and grounds. Their main focus was to provide an educational schoolyard and making their buildings as Eco-friendly as possible. The school's educational program

interacts with the schoolyard. The children learn about managing stormwater, learn how about composting, how to grow and harvest food, and even learn about solar power. The children also are involved in volunteer work with local food banks which they harvest the food in their own schoolyard. The schoolyard has an outdoor amphitheater where outdoor classrooms and assemblies are held.



LEFT: The outdoor amphitheater area where outdoor classrooms and assemblies take place.







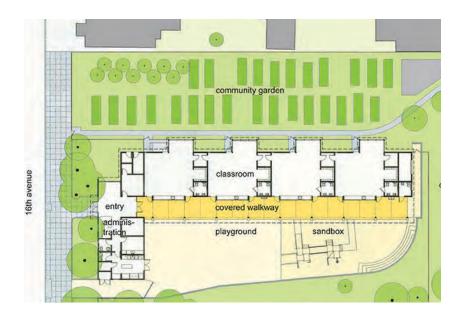
LEFT: The natural stepping logs allow children to engage in active play.

RIGHT: The water pump and dry creek allow the children and interact with water. Children learn about water movement.



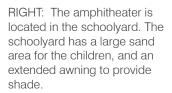
Argonne Child Development Center

San Francisco, California





LEFT: Here children learn about harvesting, and how to plant plants in this area.





LEFT: A view from inside one of the classrooms looking up into the skylight. You can see the solar panels catching the light. The children learn about solar power and get to experience it right in their own classrooms.

RIGHT: The awning out on the playground which gives the children lots of shade during recess periods.

Green School with Educational Garden

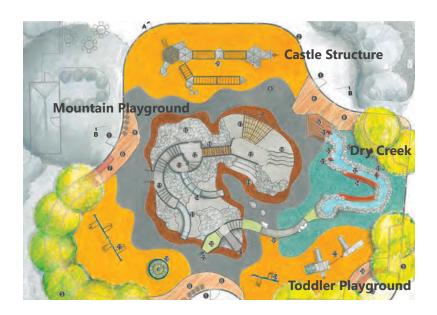
Argonne Child Development Center was originally a one room school. In January 2003, the finished renovations to the school added three additional rooms to meet the districts needs. The school added skylights which double as solar panels. They designed cross-ventilation through window placement. They were able to keep the existing community gardens that surrounded the school. In these gardens the children learn about harvesting, and growing their own food. Because the solar panels are in their classrooms, they learn about solar energy. The cost of the renovations came to \$1.9 million which mostly was raised by the community.





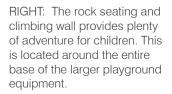
Lafayette Park Playground

San Fransisco, California



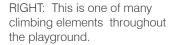


LEFT: The wave pole is located in the main children's playground area.





LEFT: The dry creek helps children explore the movement of water.



Explore, Adventure, and Fantasy

Lafayette Park was one of thirteen parks that received \$10 million in funds from the Clean and Safe Neighborhood Parks Bond. In July 2013, the park reopened with a new playground. It is unique in its own way. The main structure is surrounded by a rock wall which can act as seating or a climbing area. It has many features like a dry creek which has water pumps to allow children to interact with water. The whole playground has rubber matting for fall protection, and it is ADA accessible. It has its own toddler playground for younger children to play out of the way from the older areas. The community raised over \$500,000 to go towards the playgrounds renovations.





Marin Country Day School

Corte Madera, California

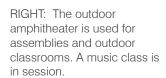


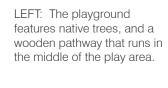
Zero Energy School

Marin Country Day School took their renovations of their school to another level. The renovations finished in 2009 making MCDS the first Zero Energy School. New additions include solar power, and a cistern that collects rainwater and provides water storage. The zero use of energy is tied into the children's curriculum. The school has its own stream which runs along with side of the school that the children interact and learn from. The school has children interact with local volunteer work, as well as participate in a recycling program on campus. The entire renovation of the campus cost \$12.8 million.



LEFT: The stream/bioswale that runs alongside of the school and through playground. Classes are held here to learn about the bioswale.







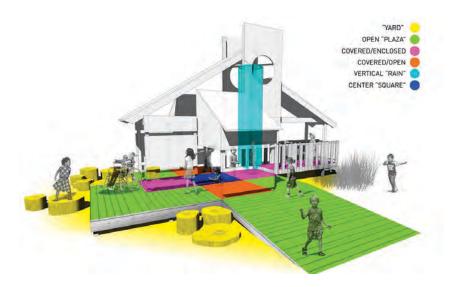


RIGHT: A conceptual rendering of the playground equipment. It is designed to mesh with school's natural surroundings.



Abington Friends School

Tower of Fun!



Central Play Structure

The goal was to find an alternative to the traditional children's playground. Elements within the playground were to be included into the curriculum by the teachers.

The central structure is designed by Metcalfe Architecture & Design. Abington Friends considered their school's philosophy, as well as the Reggio-informed learning experience and family input during the design process.



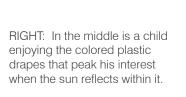
LEFT: Children using ribbons in a creative way.



RIGHT: Simple play structure. When designed correctly, a central play structure can be utilized in many ways.



LEFT: Surrounding the central play structure are other play elements. One of which is the stepping logs that can improve the children's motor skills.





Edward "Babe" Heritage Elementary School

Omaha, Nebraska

From Past to Present.



Themed Schoolyard

The designers utilized the history of the community to create a theme throughout the schoolyard. The key contributors and supporters were the PTO and the entire Omaha community.



LEFT: The children are enjoying the willow hut as they read a book together.



RIGHT: The central area in the schoolyard is the stage. The background of the stage is a recycled barn door donated by the community.



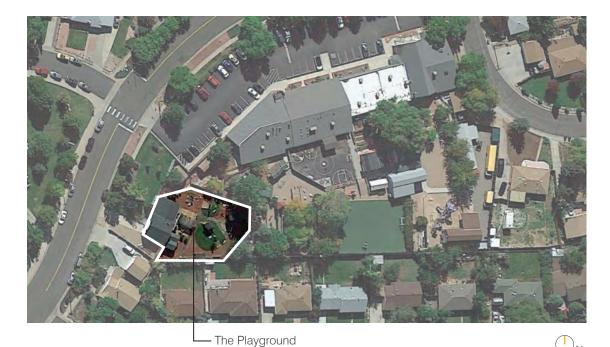
LEFT: This is the second addition to their schoolyard. It features a track with other play structures surrounding it.



RIGHT: The integrated hill in the design is an excellent place to conduct various science experiments.

A Child's Touch

Thornton, Colorado





Children measuring plant growth.



Children molding the mud.

Elemental Play

The goal was to acclimate kids to nature by introducing them to components of nature: Earth, Wind, Water, and Fire. The use of these components create a multitude of combinations for active learning and play. At "A Child's Touch School", the children also learn about different plants by tracking the plants' growth.



Children manipulating the water current within a channel.

Wind, Water, Fire, & Earth

Brown Street Academy Elementary School

Milwaukee, Wisconsir





Children helping to add mulch to the site.



The shade structure being utilized.



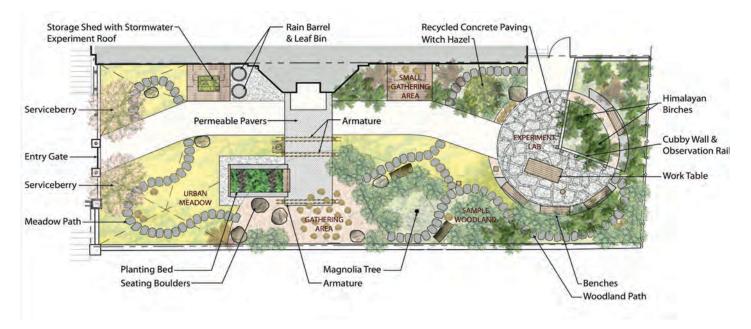
The various surface materials in the green areas.

Permeable Surfaces

The goal of the project was to create "healthy, high-quality environments". The site features a large green area that is primarily made of permeable surfaces. These surfaces include various wood chips, stone, and turf. The school could then utilize this environment to educate the children about nature and various ways the permeable surfaces can be utilized for stormwater management.

From Stagnate to Resilient

Mendell Elementary School



Sustainability in a Small Space

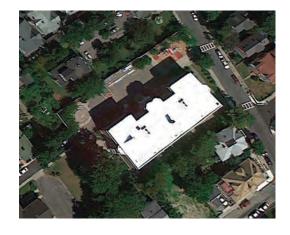
As part of the Boston Schools Initiative, Mendell Elementary is a twostage renewal program started in 2000. An outdoor classroom was later added in 2010.

Although the school is small, with limited space, the schoolyard accommodated modern play equipment with poured in place rubber surfaces.

The outdoor classroom design includes gravel pathways, a raised concrete planting bed, seating and plantings laid out in different arrangements to accommodate various uses.

Construction: 2000-2010; 2 stages Area: .3 acre playground, .1 Acre garden

Funding: Boston Schoolyard Funders Collaborative





ABOVE RIGHT: Aerial view of Mendell Elementary and extensive paving.

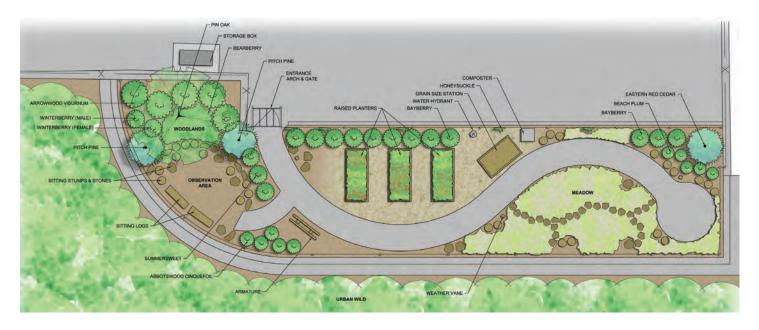
LEFT: A narrowly paved alley with minimal green space.

RIGHT: Alley transformed with permeable surfacing and new vegetation.



Adams Elementary School

Boston, Massachusetts



Green Classroom

As part of the Boston Schools Initiative, Adams Elementary got a facelift. With the help of CBA Landscape Architects from Cambridge, MA, the school renovated a school parking lot into a playground and outdoor classroom.

The playground features modern play equipment with poured in place rubber surfaces. The outdoor classroom features pathways, raised planting beds, seating, and diverse plantings for students to study.

Construction: 2008 Area: .23 Acres

Funding: Boston Schoolyard Funders Collaborative





ABOVE RIGHT: Aerial view of Adams Elementary and its extensive paving.

LEFT: Before- An under utilized school parking lot.

RIGHT: An eco- friendly modern children's playground and outdoor classroom.



Samuel Green Charter School



Sustainable Learning

Samuel Green received a grant from the Emiril Lagasse Foundation to construct an edible garden, along with a new playground and athletic field.

The garden has many educational features. Children learn about growing fruits and vegetables and the plants that attract butterflies.

Along with raised planting beds, the garden also has a three tiered shade shelter with a green roof.

Construction: Aug 2007 Area: 1.09 Acres

Funding: Emeril Lagasse Foundation, Community Fundraisers



TOP RIGHT: Children walking to class under trellis.

LEFT: Aerial view of the garden, plant beds, trellis, and green roofs.

RIGHT: Fundraiser held in the garden.





Greensboro Childrens Museum

Greensboro, North Carolina



Teaching Nature

The Greensboro Children's Museum Edible Schoolyard Garden is a comprehensive outdoor learning environment for both young and older children.

The National Learning Initiative worked with local design teams to develop an organic teaching garden. The garden features chickens, vegetables, fruits, herbs and a pond.

The materials incorporated in the garden include gravel paths, block wall planting beds, and reclaimed log fencing.

Construction: Sept 2009

Area: .6 Acres

Funding: Private donations, Event hosting.



LEFT: Children participate in a gardening class.

TOP RIGHT: Children explore the garden.

RIGHT: A plant rich environment for students.





Kensington Road Elementary

Natural Play on a Natural Playground



Natural Play

his playground was built to increase natural play on a playground designed using the existing terrain. The main goals were to create an authentic, disability-inclusive way to exercise and to create an innovative way to engage students. They also wanted to allow creative, imaginative play that allows play involvement for physically challenged children. The school also wanted to use the land for play rather than relying on playground equipment. The project was built through mostly volunteer work. The project cost roughly \$70,000, acquired through donations and grants, along with donations of materials from local businesses.



LEFT: The students show their appreciation for their newly built playground to the donors and volunteers of the project.



RIGHT: Climbing wall and slide built into the natural terrain of the site modified to suit the design of the playground.



LEFT: Children playing on the newly built playground on the opening day after completion.

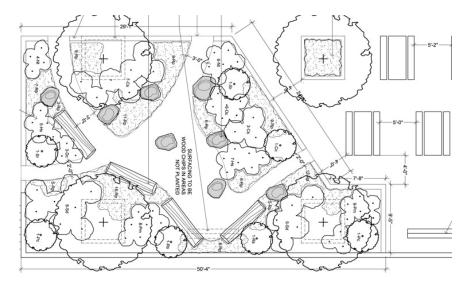


RIGHT: Slides were some of the only traditional play equipment installed on site.

General Brock Elementary

Vancouver, British Columbia, Canada

Inspire Imaginative Play Experiences

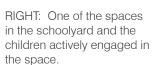


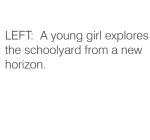
Small Budget

Ceneral Brock Elementary School had two natural play spaces designed and installed in the schoolyard. These additions were identified as priorities for improvement by parents, staff and students. The play spaces allow the students to experience play in a planted environment. The project was constructed on a very small budget of approximately \$8,700 which included a \$500 grant, donations, and volunteer work from the surrounding community. The components for the green spaces were all supplied and delivered free-of-charge by a local construction company and real estate agent.



LEFT: The students explore their new natural play space with excitement even before it's completed.









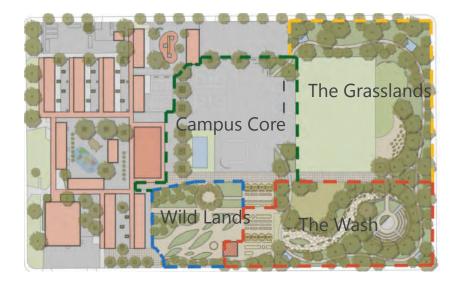
RIGHT: The lush green playspace brings a new feel and view of the schoolyard.



Walgrove Elementary

Los Angeles, California

Create Outdoor Learning Opportunities



Certified Habitat

algrove Elementary School is known for V the Walgrove Wildlands, which consists of a 25,000 sq. ft. schoolyard habitat and outdoor laboratory. Established as a Certified Wildlife Habitat by the National Wildlife Federation, the school includes a garden program which consists of an organic garden, individual classroom garden boxes, a vegetable and herb garden for the cafeteria, and a Monarch Butterfly Habitat. The school mainly focused on incorporating ecological principles for habitat restoration, allowing students to engage with nature, and enhancing academic performance.



LEFT: The students learn about nature and butterflies in their Monarch Butterfly Habitat.



RIGHT: Students proudly showing off freshly picked vegetables from their cafeteria garden.



LEFT: Elementary students volunteering their time to help construct the rain garden.

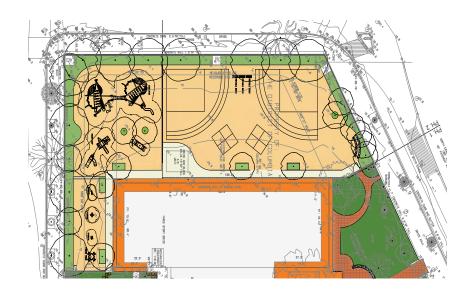


RIGHT: The students touch and smell the plants in their butterfly habitat garden.

Brent Elementary

Washington, District of Colombia

Importance of Outdoor Education



Nature's Classroom

Brent Elementary School developed an ecological schoolyard revolving mainly around the concept of outdoor education. The project site is roughly 1.5 acres, and is based on creating "Nature's Classroom". They also focused on improving safety and increasing student health through physical activities and providing a healthier environment. Other goals include restoring native plants, animal habitats, and implementing stormwater management. The project cost approximately \$1,300,000, acquired through donations and grants.



LEFT: A student admires the butterfly garden as she walks towards the southern entrance.



RIGHT: One of the outdoor classroom settings built on site.



LEFT: The rain garden installed along the fence of the school is used for both ecological and educational purposes.



RIGHT: One of the outdoor classrooms.

Children's Museum Schoolyard

Edible Gardens



Emphasis on gardens

Though not a schoolyard the edible garden beds are utilized by local schools routinely for the hands on education of food crops. It is approximately half an acre in size and is divided into garden beds. Children are encouraged to take part in maintaining various crops and learning how crops are grown. An outdoor kitchen and a food preparation area were incorporated into the schoolyard design to compliment the garden bed area.





LEFT: Natural materials were heavily used on the site. Mulch was used as a groundcover. Naturally occurring materials for the paths.

RIGHT: Native flowers are used throughout the gardens and are an excellent source of food for wildlife including birds, bees, and butterflies.



LEFT: Garden beds are arranged in formal rows with mulch paths allowing access to each bed.



Montessori Community School

Durham. North Carolina

Natural Materials

Integrating Nature in Design

This schoolyard consists of several acres. It incorporates hands on learning through interactions with natural materials. It has earth mounds and depressions featuring sensory themed native plantings and natural materials such as stones and wood.

This was used for inspiration in the design with the goal to incorporate natural play into the schoolyard while not being entirely reliant on man-made play structures.





LEFT: Shaped earth mounds and depressions provide natural play areas. They provide perch points where children experience creative play.

RIGHT: Tall ornamental grasses and stepping stones are used to create a natural maze for the children. As an added benefit they can explore the textures the grasses provide.

RIGHT: Natural materials such as mulch and stone are used in the schoolyard. The children are encouraged to explore and walk through the stream bed and the Birch grove.





First Environments Early Learning Center

Hands On Learning

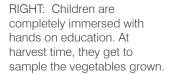


Education Focused

his schoolyard utilizes raised beds and the children's involvement in planting and maintenance. The raised beds are a simple, but effective way to grow crops in a place where the existing soil may be of poor quality. A unique aspect of the schoolyard is an outdoor stage for the children with a shade sail.



LEFT: Raised garden beds are a great way to organize the layout of the garden. It alleviates potential problems with the existing soil.







LEFT: The children are given an outdoor stage to express themselves freely and to allow them to engage in creative play. The shade sail provides immediate shade for the stage

Landscape Arboretum Green Play Yard

Natural Play

Spacious Design

The use of natural materials and native plants are intended for hands on learning. The site is also uniquely divided for different age groups by plantings and pathways rather than solid objects such as fences. This separation technique makes the site feel open and larger than it actually



LEFT: Paths and natural planting separate the play areas without the need for fencing while creating visualy aesthetic spaces.



RIGHT: Wooden platforms function as perch points for the children and also serve as seating.







Sherman Elementary School

A Drastic Transformation...



LEFT: The schoolyard before construction was originally a terraced asphalt area with little vegetation.

RIGHT: After construction, the schoolyard was completely transformed into a place of fun, education and interest for the students and the community. Sixty-eight percent of the impervious surface was removed.

LEFT: The students and community members were involved in the construction of the schoolyard. This gives a sense of pride and accomplishment to the school and all who helped.

RIGHT: This is a view looking into the schoolyard's outdoor learning area. It gives a good idea of how much plant material was added along with the new look of the schoolyard through the paths.

A Sense of Place

Cherman Elementary was once the Otypical schoolyard - a sea of asphalt with the painted basketball courts and game designs on the ground. They had a goal for the schoolyard that would require a drastic change: making their schoolyard ADA accessible, creating landscape designs that accommodate the building and, most of all, creating an environment that would benefit their students and encourage learning. That goal was achieved! Though this 53,106 sq. ft. project came to a total cost of \$1.9 million, much was accomplished from creating ponds and outdoor learning spaces, having edible gardens, new plant material, using solar energy, and much more! The design was completed in 2006 by 450 Architects, Inc. and Landscape Architect, Jeff Miller.









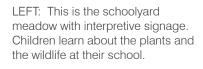
Henry Grew Elementary School

Athletics + Academics = Achievement



LEFT: Henry Grew's Schoolyard before construction was a plain, asphalt field leaving little to the students' imaginations.

RIGHT: Entrance of the outdoor classroom and the track. The new Henry Grew schoolyard captures the interest of the students with the multiple things they can do and the spaces they can go to play and learn in.





RIGHT: Students sitting in the outdoor classroom reading and playing checkers. The classroom is surrounded by a natural setting of plants.

Fitting in with Nature

With recreation and outdoor activity being a key component in adolescent development, Henry Grew Elementary School decided to take action and transform their once boring schoolyard into a place that their students will learn and have fun in. The 29,000 sq. ft. project was completed in 2012 by Warner Larson Landscape Architects. Design elements included:

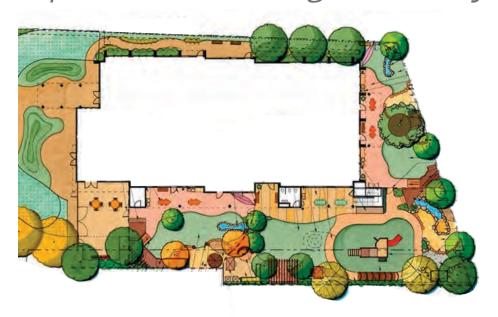
- outdoor classroom
- running/walking track
- play area
- sports field
- gathering spaces
- meadow, forest, and understory plantings





Bayshore Children's Center

Exploration and Imaginative Play



LEFT: Canvas shade covers hang above grassy turf and sand areas which are separated by log stumps and fences. Jumping platforms, ramps, and net climbers allow children to explore their physical capabilities.

RIGHT: A tiered water structure allows for hands-on learning and imaginative play. Children can use the sand and the water mixture to build things.





Creative Play

Bayshore Children's Center is an early childhood development center. Design components had to be focused on how to help these young children grow, be creative, and learn all at a young age. The 8,000 sq.ft. space had to be designed to be interesting and safe for the children. The design team included Miller Company, Dorman Associates, and Sherwood Design Engineers. The collaborative effort of this team created a place that introduces both active and creative play areas, in addition to being environmentally friendly and aesthetically pleasing. Design elements consisted of:

- shade structures/vegetation
- seating areas
- play structures
- undulating logs
- water features



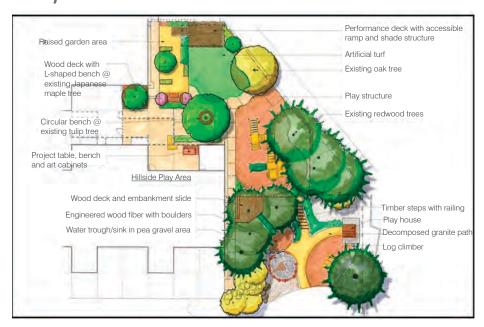




De Anza Child Development Center

Berkeley, California

Inspiration from the Great Outdoors



Educated by Nature

De Anza College Child Development Center took advantage of their surrounding woodland area to create their new schoolyard for their students. The Development Center teamed up with Miller Company and Guerra Construction Group to create this green, educational play space. Many elements were added to the site such as water troughs, embankment slides, decks and play houses, log climbers, and much more!



LEFT: Multiple seating areas are integrated into the sinuous play areas surrounded by a variation of plant material.



RIGHT: Play structures and equipment are integrated into the landscape to create a more interesting and dynamic design.



LEFT: Planting beds and a stage allow for community events and more opportunity for children to learn.



RIGHT: A young girl works at child size planter. Even toddlers can learn to work with and grow plants and appreciate them.

Ian Potter Foundation Children's Garden

In a Garden, Places Have Names



Named Gardens:

Children have the opportunity to better understand the connections between plants, food, and culture.

There are many surprises to be found by children at this garden. It combines art, ecology, and discovery in a playful way.

All parts of the garden have names, such as Kitchen Garden.

Site size: 1.23 acres (53,819 ft²)



LEFT: A hedge frames the artistic sign that welcomes visitors to the garden.



RIGHT: Children learn how plants are grown in the potting shed.



LEFT: In the children's kitchen garden, beans climb poles, and tomatoes hang from vines.



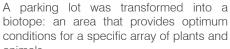
RIGHT: A stone bridge/ tunnel enables risk-taking, an important part of childhood.

Ikiminami Primary School Garden

Ecological Function Depends on Scale



LEFT: A stream in the biotope easily becomes a playground.



Biotope:

biotope: an area that provides optimum conditions for a specific array of plants and

Construction was completed by teachers, students, volunteers and professional contractors.

Many kinds of play (186 total) were observed that reveal the complex nature of how children experience life.

Site size: 400 ft² (approx.)



RIGHT: Exploring to find insects and flowers is a regular part of learning about ecology.



LEFT: Mallard ducks were born in this biotope.



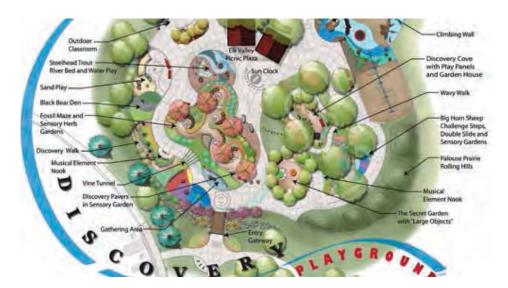
RIGHT: An earthen nature play structure encourages climbing and hiding, but also watching, an important type of play.



Discovery Playground in Les Gove Park

Spokane, Washington

Barrier-Free Accessibility



Accessibility:

Barrier-free design aspects provide many opportunities for children with a wide-range of physical and developmental abilities to learn, play and socialize with their peers.

Site size: 0.73 acres (32,000 ft²)



LEFT: A creative play area, Eagle's Nest and Eggs, is one of the play spaces where children can pretend to be baby eagles.

RIGHT: Multi-colored arches serve as an arbor for the vines planted at their base. Children can run through the tunnel that will be created.





LEFT: By standing on the current month in the middle and raising one arm up in the air, a child becomes part of an interactive sun clock. Their arm will cast a shadow pointing to the current time.

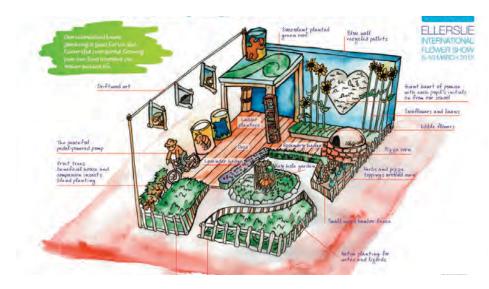
RIGHT: Children can learn about ancient creatures as they follow the fossil maze.



Raumati South School

Raumati South. New Zealand

Innovative, Sustainable Design



Eco-friendly:

Students learn about sustainability in various ways. They learn about recycled materials used to create art; human-powered irrigation from rain barrels collected from a green roof; kitchen scraps that are composted; and small habitats that provide shelter for wildlife.

After the schoolyard was built, it was dismantled and gifted to a less-fortunate school nearby.

Site size: 387 ft²



LEFT: As someone pedals the bicycle, a water pump irrigates the plants.



RIGHT: Herbs grown in the garden make good toppings for pizza which is then baked in the pizza oven made from recycled bricks.



LEFT: Rainwater is havested from the greenroof and stored in rain barrels, decorated by students.



RIGHT: The pumice stone sculpture is made from individual pieces, each of which has a student's initials on it.

Lanier Middle School

Fairfax, Virginia

Encouraging Stewardship



Environmental Service

The Eco-Schools process is most effective when it's a team effort with students at the center. That is certainly true at Lanier Middle School in Fairfax, Virginia. The students, with lots of encouragement from science teacher Faiza Alam and other staff, put their energy wholeheartedly into a variety of rewarding projects.

It all started with a requirement for seventh graders to complete environmental service hours each quarter. In two years, Lanier students have amassed an impressive 3000 hours of service.



LEFT: One of the first projects that Lanier tackled was to turn the courtyard into an outdoor "living classroom." They replaced the turf grass with 75 species of native plants, and constructed a vernal pool.

RIGHT: Lanier Eco-Club students participated in Veteran's Day community workday sponsored by Accenture on November 11, 2013.



LEFT: Lanier students conducted a biodiversity survey in a wetland area adjacent to the school.



RIGHT: Doing outdoor survey work was new to most of the students, but soon they were utterly engaged, and several students spent the entire day outside.



Springside Chestnut Hill Academy

Philadelphia, Pennsylvania

Artistic Downspouts



Treating Stormwater as **Art**

Water is carried from the roof gutter through a series of pipes reminiscent of the watershed. Artist Stacy Levy, working with the science and art teachers and Frank Aloise, the manager of Springside, designed the downspouts to help students visualize how to keep storm water out of the local streams. This garden functions by treating the storm water in place, and preventing it from being expelled directly into the local waterways, thus reducing the effect of erosion of the stream's banks.



LEFT: Existing asphalt traffic circle. Asphalt was removed and became site of new planting area at left.

RIGHT: Undeterred by a drizzly fall day, lower school and 6th grade students planted over 50 native species recommended by Pennsylvania Horticultural Society to attract birds and pollinating insects.





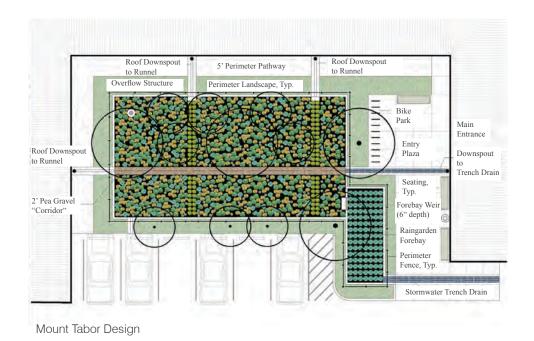
LEFT: The design process was carried out by the 4th graders. They generated ideas and made prototypes using recycled materials. The younger students tested the prototypes and provided feedback.





Mount Tabor Middle School

Portland, Oregon





Asphalt Parking Area



Rain Garden

Innovative Rain Garden

Designed by Kevin Robert Perry, ASLA. Mount Tabor Middle School Rain Garden is regarded as one of Portland's most successful examples of sustainable stormwater management. This project transformed an underutilized asphalt parking area into an innovative rain garden that melds the concepts of art, education, and ecological function.

Approximately 30,000 square feet of impervious area runoff generated by the school's asphalt play area, parking lot, and rooftops, is elegantly captured and conveyed into the rain garden via a series of trench drains and concrete runnels. Once inside the landscape space, the water is allowed to interact with both plants and soil while soaking into the ground.

Elegant Raingarden

Sidwell Friends School

Washington, DC



Plan in Section View



Central Courtyard



Hardscaping detail



Rain Garden

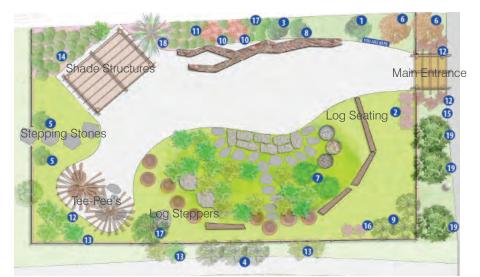
Stormwater Management System

Andropogon Associates. In 2007, the school renovated and expanded its middle school to increase classroom space for a growing enrollment. The new U-shaped middle school building surrounds a central courtyard that features a terraced wetland, rain garden, and habitat pond. This outdoor living classroom captures, filters, and re-uses building wastewater and site runoff. Students are immersed in these environmentally responsible systems, which complement the school's science curriculum.

The picturesque courtyard is also home to a sophisticated stormwater management system, which adds to the site's ecological and educational purpose. All hardscape surfaces, including plazas and paths, are surrounded by vegetated swales, which allow rain water to slowly infiltrate the land rather than rapidly flowing to city drains.

Living Classroom

Mission Hill K-8 Schoolyard



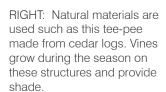
Outdoor Learning

Ray Duentz Landscape Architecture, designed a .08 acre adventure nature play schoolyard for this K-8 Public School in Boston, MA.

The project features interpretive plantings, rustic structures, plant beds, a water chute and dry stream bed for education and play. This site promotes sustainability by using natural and recycled materials and Best Management Practices by making the site pervious. It also creates educational opportunities by allowing for an area that can be utilized as an outdoor classroom.



LEFT: An overhead structure made from cedar delineates the entrance into this space.







LEFT: An inexpensive and clever way to create seating and define a space is with a natural downed log.

RIGHT: Cedar logs sawn in half create this seating. Recycled drainage pipes add character and an interesting area for planting.



Natural & Recycled Material

Perkins Schoolyard

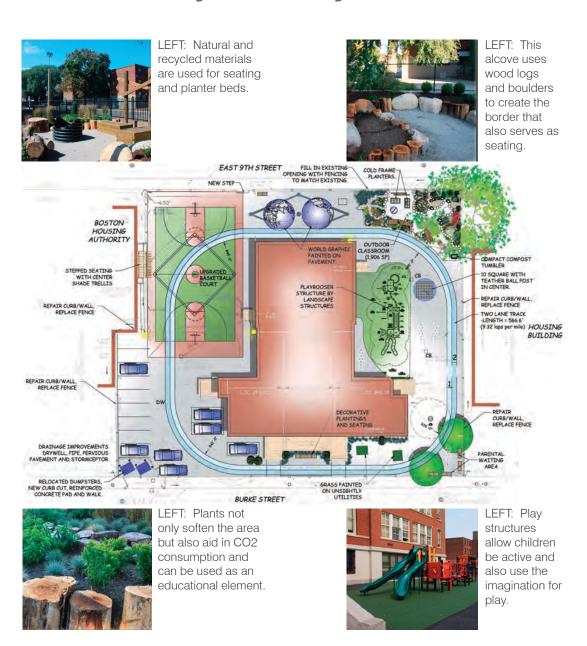
South Boston, Massachusetts

Natural Play

ICON Parks Design studio transformed the .08 Acre Perkins School Playground, from an entirely asphalt site, to an enjoyable and educational space. The site consists of both a play-scape and an educational outdoor classroom area. The play-scape consists of a manufactured play-scape structure with rubberized flooring in the fall zone, as well as a small running track. The educational classroom area consists of themed planting areas that reflect the historic New England landscape,

such as a Pioneer Meadow; a Post Argicultural/Old-Field planting; an Oak Forest understory with a hill top; and low slope planting communities. The different components provided by ICON Parks Design gives the teachers the amenities to assist in their lessons and the students learning. Some of these amenities include a Twin Pole Amature, Cold Frame Planters, Water/Sedimentation Table, Compost Tumbler, and Soil Experiment area.

Natural, Recycled & Synthetic Material



Russel Elementary School

Dorchester, Massachusetts



School Garden

At Russell Elementary School, Klopfer Martin Design Group again, took a .12 acre portion of a recreational play area and converted it to an outdoor classroom. Children benefit from emotional and physical well being when they plant, nurture and harvest fruits and vegetables. Within this site there is a meadow, woodland, a gathering/classroom area, an experiment area and a rain garden as well as seating and writing areas. This site promotes Best Management Practices, sustainability, and ecological awareness.



LEFT: Learning about nature, plants, and the environment can be incorporated into the curriculum.



RIGHT: Raised planters allow children to explore plants more conveniently and reduce the need to ammend the soil.



LEFT: Before picture of the property. All grass and no play or educational areas.





Natural, Recycled & Synthetic Material

Winship Elementary School

Brighton, Massachusetts

Outdoor Classroom

At Winship Elementary School, KMDG took a portion of their recreational play area and converted it to an outdoor classroom. Within this site, there is a seating/gathering area, planting beds, an urban meadow, armature/shade structure, fern under-

story, woodland and a lab/experiment area. This site promotes sustainability by providing planter beds where students can grow vegetables. It teaches children how plants and animals work together within an ecosystem.

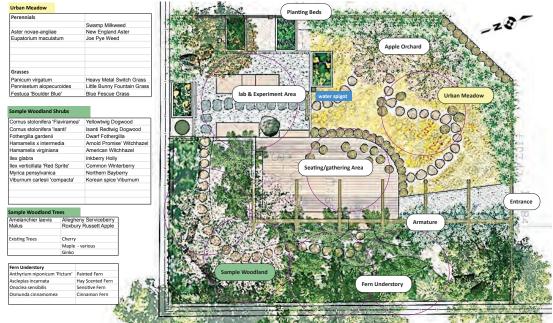
Natural & Recycled Material



LEFT: Aerial view of the outdoor classroom and integrated design elements.



LEFT: The outdoor classroom in use by teachers and students learning about the plants and their surroundings.





LEFT: An image before the classroom was installed. Vast asphalt area limits not only play, but also the educational experience.



LEFT: An upclose look from the experimental area. Raised planter beds can be seen along with the lab table.

Credits:

Inventory & Analysis

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Case Studies:

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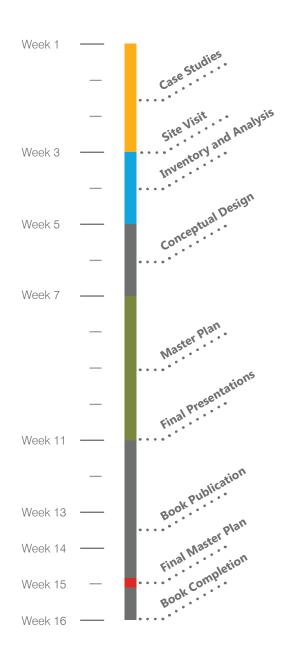
REFLECTIONS

Looking Back...

As we reflect on this past semester, we know that we will apply the lessons learned to other projects in the future.

Reflections of 16 Weeks

Atypical semester at Temple University consists of 16 weeks. Our studio class of 13 students spent the entire semester deeply immersed in researching, designing, and producing a final book for the Clara Barton Elementary School and the adjacent Annex Park project. The design process began with three weeks of researching case studies that were relevant to our project and that would serve as inspiration for our design. We then conducted site visits, utilizing the findings to assemble pertinent site inventory and analysis information. What followed was the design phase of the project. The first step involved conceptual designs that were represented on white trace paper. Eventually, the designs were refined into final master plans as shown in this book. At the eleventh week, the final master plans were presented to members of the P.T.O. and design professionals at Temple. The P.T.O. at large reviewed the designs in the following week and chose one design to use as Clara Barton Elementary School's final master plan. The "reflections of the 16 weeks" captures the essence of the design process.



Week 3 Interviews with Parents & Children





Site Inventory and Analysis

TOP LEFT: Zoe Boothe-Jarrett interviewed children and parents as school was let out for the day. Many students were interested in providing input about improvements for the schoolyard.

RIGHT: Temple students explored, documented, and analyzed the lone climbing structure and its adjacent surroundings.

TOP CTR: Stephanie Redeagle spoke to children about their desires for the playground and annex space.

BELOW: Wayne Hoffman and Daniel Bramhall interviewed a parent and her children. Their ideas were noted on the clip board.





Week 3 Interviews with Parents & Children









Week 6 Interim Design Review



Conceptual Design

LEFT: Members of the P.T.O. elaborated on the program for the schoolyard.

LEFT CTR: Stephanie Redeagle presented her design which incorporated a Native American theme.

RIGHT CTR: Julia Kotarsky presented her conceptual design. Her main concept included an addition of parking, open play, and play structures.

BELOW: Pat Skelly discussed the P.T.O.'s wishes for the project.







Week 11 13 Master Plan Presentations





Final Master Plan

TOP LEFT: Professor Tai opened the presentation with background information about the site and project.

LEFT: Daniel Bramhall presented his master plan, which focused on a central green.

TOP RIGHT: Michael Swercewski described the use of geometric shapes to delineate spaces within the schoolyard.

BELOW: Julia Kotarsky presented the phasing and cost estimates for her project.



Week 11 13 Master Plan Presentations









Week 15 Final Mater Plan Presentation



Photo courtesy of: Diedre Ryan, Editorial Photography

Final Master Plan

ABOVE: Stephanie Redeagle presented the perspective view of the final master plan.

RIGHT: Michael Swercewski and Stephanie Redeagle answered questions regarding safety issues.

BELOW: Michael Swercewski informed the school members of the revisions made to the plan.

FAR RIGHT: Professor Tai introduced the project to the school P.T.O. and community members.





Week 15 Final Mater Plan Presentation



Photo courtesy of: Diedre Ryan, Editorial Photography







Senior Design Studio V

During the 16-week fall semester in 2014, 13 Temple University Senior Landscape Architecture students completed the design for Clara Barton Elementary School. Members of the school including the Parent Teacher Organization (P.T.O.), principal, superintendent, teachers, children, parents, and community were involved throughout the design process. The students' work were reviewed at various points in the design process by members of the P.T.O., professional landscape architects with playground expertise, and play equipment design specialists.

The students worked in groups to interview the users of the schoolyard to solicit input for the design. They researched more than 44 case studies that were relevant to their design. They performed comprehensive site inventory and analysis to fully understand the site context. Each student worked individually to create a master plan, perspective drawings, a planting plan, a grading plan, and phasing plans. The semester's work documented in this book was developed as a class effort under the team leadership of Dan Bramhall, Zoe Boothe-Jarrett, and Michael Swercewski.