This 230-page book communicates the design process and design alternatives for creating an eco-schoolyard.
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 Clara Barton 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 design solutions for the Clara Barton 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 School with suitable design solutions that provide an educational and active environment for children that would also 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.

Photo courtesy of: Diedre Ryan, Editorial Photography

Executive Summary

The existing schoolyard is 86%+ paved. This project transforms the schoolyard into an eco-friendly environment by utilizing concepts of green infrastructure.
A series of site analyses were conducted to understand the site’s context, potentials, and constraints.
The site is predominantly flat which offers a blank canvas for design. Currently no drainage issues are apparent at this site, however, the design of stormwater management facilities would enhance the site and promote sustainability.

**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, run-off water collects at this point. Interception of this water flow is necessary and will further enhance and promote the goal of an ecological schoolyard.

**ANNEX**

Topography and drainage informed how we could integrate BMPs into the design.
Views & Aspects: Annex

Front & Side
LEFT: Front entrance of the Clara Barton Elementary School.
RIGHT: Adjacent to the school is an abandoned barn.

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.

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

The Schoolyard
A Views analysis explored how to best provide views into/out of the site and to best promote greening of the schoolyard.
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.

Our analysis showed one major constraint: There was only one existing tree in the schoolyard!
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
The 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 a 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.

This student’s design showed concepts for integrating play, education, gardening, and environmental education.
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.

Perspective sketches show a variety of outdoor activities for children and the community.
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.

This student integrated design elements such as play structures, raised beds, outdoor classrooms, and a tool shed to encourage passive, physical and social interaction.
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.

A complete set of drawings were produced by each student to communicate their design ideas.
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.

### Planting Concept

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### Detailed planting plans and plant palettes were incorporated for biodiversity and low maintenance.
Out of 12 alternative designs produced by the class, The Clara Barton School Board selected this design to develop further.
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’x6’ plant beds are laid 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. Pots 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.

The final design incorporated a greenhouse, raised beds, music garden, and play mounds. These features provide opportunities for interactive and imaginative play and learning.
These perspectives detail passive and active spaces. A community garden with a variety of seating is incorporated in the Annex park across from the school.
Reflections of 16 Weeks

A typical 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.

A book was published to communicate the design process, criteria for designing for children, and concepts of green infrastructure that was integral to creating the eco-friendly schoolyard.