



CPCC / School Project

Sustainable Futures 2003

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1.0 Introduction

In Cerro Plano, the school, bullring, and salon, adjacent land sites owned by the Ministry of Education, present the opportunity to develop a better utilized community center. The CPC (CPS) plans to build a new school where the salon is presently located with twice as many classrooms and additional education space as well as adding new programs like music, computers, and art. Development of this area into the Cerro Plano Cultural Center (CPCC) will serve as an extension of this new school while constructing a landmark community area serving a variety of community needs. The school administration, along with Monteverde Institute and greater community, has many goals they want to see for this space.

2.0 Goals and Objectives

- Sustainable design features
- Balance between cultures in Monteverde Zone
- Better academic program for CPS
- Increased economic viability (through renting existing school as well as new facilities)
- Offer a family center for community
 - Recreation
 - Culture
 - Education
- Generate new options for entertainment and employment
- Indoor sports facilities
 - Soccer
 - Basketball
 - Volleyball
 - Tennis
 - Roller Skating
- Outdoor play space
 - Play structure
 - Open multi-use field
- Diversify tourism

- Eco-tourism
- Bio-Diversity
- Local and international influences
- Good indoor multi-use community space
 - Graduations
 - Art fairs
 - Musical and theatrical performances
- Improved site drainage

3.0 Site Analysis

3.1 Site Conditions

The future CPCC and CPS site is located across the street and west from the existing school site as shown on the site analysis map (Appendix – Figures 1 & 2). The current bullring sits on the Northwest portion of the site. Currently the bullring is only officially used once a year for a bull festival. The site has steep grade changes on the north, west, and east sides, with the road bordering on the south side. The site itself, however, is relatively flat. The open areas south of the bullring have had standing water during relatively dry periods indicating the site's poor drainage. Behind the bullring is a large hole containing illegally dumped garbage, as well as 4 non-functional bathrooms. The bullring itself is structurally sound although the exterior sheet metal walls are gapping in spots and most residents agree that the exterior is unattractive. The bullring site is 3 meters higher in elevation than the salon and potential future school site.

3.2 Climate Conditions

The site is mostly flat and open, leaving it exposed to high winds in the dry season (from December – April), but also supplying sunlight on pleasant days. The wet season's (May – November) high rainfall means that spaces need to have some shelter from precipitation, as well as the need for efficient drainage systems to prevent erosion. The steep topography on three sides of the site requires additional drainage to manage runoff onto other properties.

4.0 Precedent Studies

4.1 Introduction

The four documented precedent studies have features that are applicable to the CPCC project. They are all multi-use facilities that incorporate sustainable design features. These studies gave inspiration to the CPCC projects design concepts by demonstrating sustainable development.

4.2 Definition of Sustainability

Sustainability-

1 : capable of being sustained

2 a : of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged
<*sustainable* techniques> <*sustainable* agriculture>

b : of or relating to a lifestyle involving the use of sustainable methods <*sustainable* society>

(Taken from the Merriam Webster Dictionary)

4.3 Fisher Pavilion at Seattle CPCC

The Fisher Pavilion at Seattle CPCC in Seattle, Washington is a multi-purpose exhibition hall nestled in the heart of the 74-acre Seattle CPCC campus completed in 2002. It replaces the old Flag Pavilion that was constructed on the same site 40 years ago as a temporary building for the Seattle World's Fair. Fisher Pavilion is one of the first buildings in Seattle to be designed and constructed under the city policy requiring all public facilities over 5,000 square feet to achieve Leadership in Energy and Environmental Design (LEED) Silver rating. The primary function of Fisher Pavilion is to promote community and sense of place. Seattle CPCC has been described as the "front yard" of Seattle. The four major spaces of this 2.6-acre project (exhibition hall, upper plaza, lower plaza, and civic green) create a wide variety of opportunities for public gatherings and events within walking distance of downtown.

Significance of Fisher Pavilion to CPCC Project

- Multiple uses by multiple parties in one space
- Off-site parking



- Sustainable building principles
- Use of an existing site

4.4 Pinecote Pavilion

Pinecote Pavilion is located at the Crosby arboretum in Picayune Mississippi. It is intended to serve as an outdoor meeting space and educational classroom for its visitors. Open construction allows for optimal ventilation, and maximum shading. The structure is an outdoor pavilion structure, situated near one of the many water bodies at the Crosby arboretum. The Pavilion was constructed from onsite Georgia Pine timber. The supporting members do not obstruct the main space. The Pavilion is located in the Pearl River basin, an associated with high temperatures, humidity, and rainfall.

Significance of Pinecote Pavilion to CPCC Project

- Uses on site materials for construction
- Open air construction
- Flexible design allows for multiple programs
- No extraneous costs associated with construction
- Uses on site materials for construction



4.5 Crossroads CPCC at Prescott College in Arizona

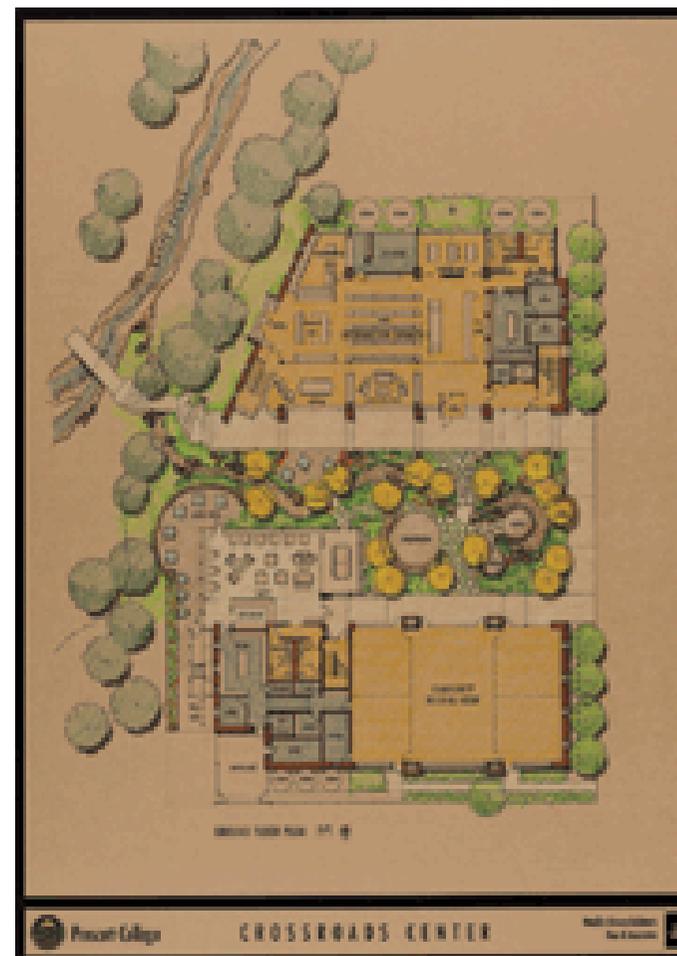
The Crossroads CPCC is to be designed with a strong emphasis on utilizing ecological design principals (mentioned above in Fisher Pavilion discussion). The Project is intended to be registered with the U.S. Green Building Council's LEED Program and should strive for a certification level of Gold or Platinum. The project should be developed to maximize multi-functionality efficiency with a strong level of interrelationship between functional areas. Crossroads CPCC has spaces for both the community and campus with a community garden, auditorium, and quiet spaces for study and meditation. Crossroads CPCC is only a theoretical example. It will not be completed until August 2004.

Significance of Crossroads CPCC to CPCC Project

- Environmentally conscience buildings and resources
- Space for art exhibits
- Multi-functional meeting space that can be utilized for multiple sized groups
- Miscellaneous indoor and outdoor social spaces and quiet meditation spaces
- A community and educational gathering area

4.6 Phillip Merrill Environmental CPCC- The Chesapeake Bay Foundation in Annapolis, Maryland

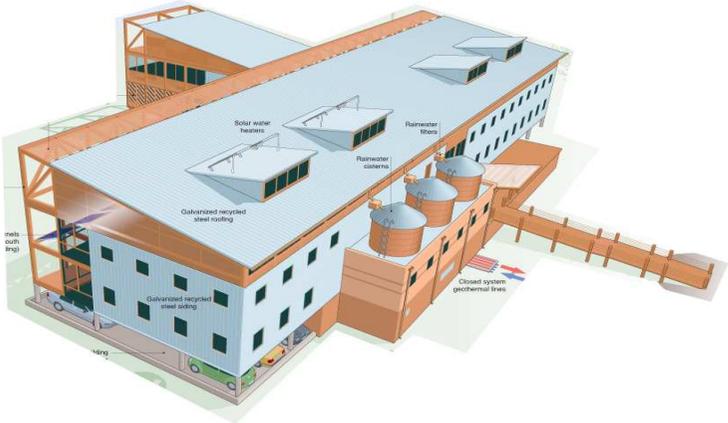
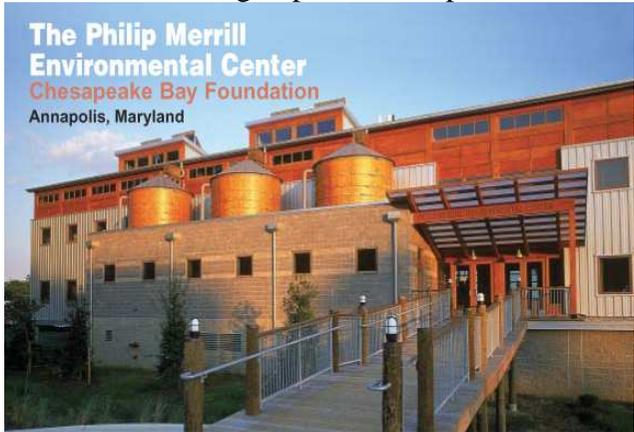
The Phillip Merrill CPCC is located along the Chesapeake Bay linking the foundation directly to the bay it seeks to protect. Constructed on a former beach club, the CPCC itself is a preservation project. The Phillip Merrill Environmental CPCC demonstrates an extension of this commitment to the environment. The CPCC encourages environmentally sound transportation practices for all its employees. The center also functions as a teaching tool by giving tours and allowing other groups to use facilities. The floor plan is open and simple and the interior is left raw to avoid harmful finishing. Cisterns collect water from the corrugated shed metal roof for use in the building. Solar energy heats all hot water. Composting toilets save water and create reducible waste.



Flooring is made out of cork, bamboo, and natural linoleum, all rapidly renewing resources. Designers avoided the use of virgin materials as much as possible.

Significance of Phillip Merrill Environmental CPCC to building Project

- Educational building
- Sustainable design features
- Use of recycled materials
- Alternative energy resources
- Minimizing impact of transportation



5.0 Programming

CPCC PROGRAM	No. of	Square Meters
Basketball Court Playing Area	1	464
Restroom-Lower	2	5
Restroom-Upper	1	5
Offices	5	55
Lobby/Reception	1	55
Conference Room - seats 14 table, 16 peripheral	1	75
Storage space, below offices	1	60
Art Room	1	60
Music Room	1	60
Seats	500	279.4
Tower	1	14
Hallways, structure, additional space	15% of total	169.86
SCHOOL PROGRAM		
Classrooms (each at 6m x 9m)	10	540
Computer Lab	1	40
Restrooms - Lavatory style	2	24
Teacher Lounge / Prep Space	1	100
Outdoor meeting space	TBD	TBD
Hallways and additional space	15% of total	106
TOTALS Multi-purpose facility		1302.26
TOTALS School		810

The CPCC programming reflects the many uses it is intended for (See Appendix Figure 3 for scheme concepts). The playing floor area is designed for a basketball court, since it requires the most space out of the desired indoor sports. At its fullest capacity, the

bleachers can accommodate 500 people (i.e. the crowd of the Monteverde Art Fair). It has three bathrooms, 2 on the first floor and 1 on the second, all of equal size. The five offices create space for administration, along with the conference room. The art and music rooms are located in the CPCC so students can be close to their performing spaces. The storage space will hold outdoor play equipment such as soccer goals. The tower will serve as community landmark and an example of sustainable design.

The school needs 10 classrooms, twice as many as they have now. They also want a computer lab to help execute the school's goal of improved educational quality, as well as giving teachers a lounge and preparation space. There will also be a restroom on each level. Potentially, an outdoor meeting space will allow the school to hold meetings outside during nice weather. Fifteen percent of the total building space is added in to account for hallways and other extra spaces needed in the school.

6.0 Design Proposals

6.1 Introduction and Overview

Both schemes incorporate the CPC and the greater community's need for a multi-functional space with practical sustainable design principles (Appendix Figure 3). They seek to be an important fixture in the Monteverde region by increasing economic viability, educational opportunities, and cultural functions. Both schemes also link the new school to the proposed CPCC for enhancement of the school's new academic program.

6.2 Sustainable Design Features

Both schemes actively incorporate sustainable design principles. The focal point of Scheme A, the wind observation tower, produces a portion of the school's electricity while educating students as well as the community on the generation of clean electricity. The overhead structure on the plaza contains recycled beams from the old bullring structure. The offices have bamboo flooring, a rapidly renewing material. In both schemes roof runoff and other drainage are treated on site by rain gardens, reed beds, and bio-retention ponds. Both schemes also use skylights and clerestory windows capitalize on the site's solar potential.

6.3 Scheme A

Scheme A of the CPCC contains most of the desired community activities (Appendix Figure 4). The retractable bleachers can seat up to 500 people (Appendix Figure 5). The first floor and playing surface are sunk into the ground. Clerestory windows line the back edge to provide natural lighting and ventilation. Some walls are partially open to allow for ventilation and natural lighting. Multiple skylights in the roof allow for natural daytime lighting. Storage areas on the first floor are large enough to hold all equipment necessary to transition the CPCC between uses. The roof's overhang drains water into the below rain garden, with underground pipes leading to the bio-retention pond (Appendix Figure 6). Around the rain garden is a meter-high retaining wall. This wall, as well as the walls of the lobby, uses native stone. The lobby is left open to transition from indoor to outdoor.

Scheme A places a special focus on linking the CCPC and the CPC (Appendix Figure 7). The entrance to CPCC, the school, and the property entrance form a triangle with a tower as a hub. Linking these areas is an overhead structure composed of recycled steel beams from the original bullring, all over an open-air plaza. The tower not only serves as a focal point, it is also as an educational tool

for sustainable design. The wind observation tower consists of three horizontally opposed turbines stacked in a vertical fashion, with a spiral staircase at the core. Each level of the tower has an observation platform at each level with safety guards, offering 3 different views of the Monteverde region. The electricity produced by the tower can help power the CPCC and school. The tower also helps educate schoolchildren and the greater community about clean energy sources and sustainability.

The remaining open space on the site serves important functions. The site is largely left open and flat to serve as a general open space for the school and community. The playground sits adjacent to plaza and close to the school and road for easy access by young children. Behind the CPCC sits the reed bed that treats all of the grey water created by the school and CPCC. Next to the reedbed lies a bio-retention pond that will hold both the discharged reedbed and rain garden treated water and absorb it slowly. All water will be kept on site.

Features in the new CPC seek to improve access to education in the CPC (Appendix Figure 8). The entrance is located near the road and play area. Roof drainage collects in rain gardens in both the front and back of the building. The area behind the school also features a courtyard enclosed by vegetation. The school has 2 floors, with the first floor built into the grade. A breezeway through the center of the classrooms provides a space for gathering. The teachers lounge and prep area are in a satellite building.

6.4 Scheme B

Scheme B gives the CPCC building a domed roofline (Appendix Figure 9). Roof runoff in this scheme goes to boulder beds that create a waterfall effect (Appendix Figure 10). The water is then channeled into grass swales and eventually a bio-retention pond in the northwest corner of the property. The playing floor can fit a basketball court along with the other desired sports (Appendix Figure 11). The elevated space west of the court caters to the artistic uses of the CPCC. This multi-level space can hold art exhibitions as well as serve a secondary theater on the lowest – furthest west - level. Curtain partitions allow flexibility in space size. This elevated space also contains a studio with sinks for more permanent artist usage. The front portion of the elevated space provides additional seating capacity for court activities. For normal capacity sports events bleachers will be pulled out from underneath the elevated space, where they are stored. The southeast portion of the building provides enclosed rooms for use by the community and the school. The lower level has bathrooms, an art room, and a music room. These facilities are linked to the school building by an enclosed hallway.

The school building in Scheme B is internally focused with a central amphitheatre serving the school's outdoor needs as well as providing a link between the school facilities and the community areas. The ten classrooms are organized with access to a sunken

amphitheatre for assemblies and small performances. Scheme B highly values indoor-outdoor space. A domed arbor strengthens the negative-positive relationship created by the amphitheatre and the CPCC's roofline. This arbor connects the school to the CPCC as well as the informal play area which occupies the southwestern half of the site (Appendix Figure 12). Very near the arbor and partially underneath trees is an interpretive play structure for the school children. Beyond this is an open field with improved drainage for unstructured play. Moving north through this space is a bermed area, which allows spectators to watch the goings on in the "cancha". Beyond the berm is a grove of trees intended as a secondary but very informal play area. Adjacent to this is one of the bio-retention areas. The main community entrance to the auditorium is via the arbor, which will provide some benches and spaces for relaxation. As a transition between the outdoor arbor space and the indoor lobby of the auditorium, the roof becomes glass in between the beams, allowing sunlight but sheltering inclement weather.

7.0 Final Thoughts

7.1 Summary

The current bullring structure near the CPC is underutilized and the site can better serve as center for the school and community in a different form. The two schemes proposed by the groups meet the expressed needs for the space: an indoor sports area, space for art and cultural events, and a community gathering space. Both schemes also make the CPCC a destination for community activity as well as an integral part of the CPC's improved educational programming. Both the school and center incorporate sustainable design principles to create as little impact as possible on the existing environment and serve a model for sustainability in the community.

7.2 Critical Reflections

Time and manpower constraints only allowed for the completion of a model of Scheme A. Having a model of both Schemes would have provided an easier visual comparison for the audience. Both schemes might have benefited from more structured uses of the outdoor space. Indigenous architecture options were not thoroughly explored, for example a more rustic pavilion-type structure for the center. The design could also benefit from the use of more sustainable building materials as the buildings' architecture becomes more detailed. Overall, the two schemes effectively meet the needs presented in an aesthetic and sustainable design.

7.3 Next Steps

Leaders of the CPC, the Monteverde Institute, and the Monteverde Zone community need to assess what they like and dislike about the two schemes to begin completion. As the plans for the new school are finalized, features from each scheme can be incorporated into the final design. Also, more sustainable building materials and educational features can be worked into construction. Any problems that would prevent construction should be addressed as soon as possible to avoid delays.

8.0 Appendices

8.1 Resources

Sustainable Futures 2002 bullring Project Report

“Highlighting High Performance: The Philip Merrill Environmental CPCC; Chesapeake Bay Foundation, Annapolis, Maryland. Office of Building Technology, State and Community Programs (BTS) Brochure” by Molly Miller. (PDF file) Last modified April 30, 2002.