Undergraduate Architecture
Ball State University
August 2008 – May 2012

Eco-Hotel Broad Ripple | 4
Julia Carson Community Center | 12
Marine Research & Education Center | 20
urbaRn Outdoor Classroom | 30
Render Technique Studies | 40
The Eco-Hotel is an upscale boutique hotel for Broad Ripple, Indianapolis that utilizes sustainable strategies to acquire net zero energy efficiency. These strategies include photovoltaics, water collection, daylighting, living walls, and stack ventilation.

Wood siding and stone were selected as building materials to create a natural aesthetic to the exterior of the structure and to play into the concept of green strategies. Water collection strategies are displayed on the exterior of the building to teach guests the importance of sustainable practices.

The plans for the twenty-one room hotel were oriented to provide guests with views to Downtown Broad Ripple to the west or the White River to the east. The offset of the rooms also permitted indirect daylighting to each of the spaces.

The central core of the hotel is accommodated by an interior garden that can be enjoyed by guests on all floors via the rotating terraces that circulate the four story atrium. The large atrium enables the building to take advantage of stack ventilation to naturally condition rooms during comfortable seasons of the year. The garden and outdoor breezes within the building create an extension of the exterior into the interior of the building which creates a relaxing oasis for guests.
To honor Julia Carson and the Legacy of Love Foundation in the community, the design addresses the social and environmental needs of the neighborhood, as well as creates a safe atmosphere that encourages community involvement.

To relate to the context of the site, a structural frame was based off a thirty-foot module that aligns with the current housing grid. This approach breaks up the building into smaller sections to identify the different uses within the community center, while still tying back to the central core of circulation.

Alternating facades step up to the current urban edge of the city’s setbacks and regresses to create courtyards and private exterior spaces for the users of the building. Exterior spaces were designed to efficiently correlate with the built environment to emphasize safety through visibility by providing a minimum of three surrounding facades that overlook each space. The overall organization of the site brings the community center and exterior recreational spaces towards the neighborhood by placing these social interactions along the 29th street block.

The main parking area for the building resides on Fall Creek boulevard to keep the main vehicular traffic spaces towards the busiest street surrounding the site. This layout allows the design to address the streetscape to revitalize pedestrian life and manage street and rainwater runoff.

The design for the community center, a partner project, was a finalist in the Gresham Smith Design Competition.
SUMMER SUN ANGLE --> 80
WINTER SUN ANGLE --> 30
SPRING SUN ANGLE --> 60
FALL SUN ANGLE --> 40

ANGLED ROOF
RAINWATER COLLECTION
RAINWATER IRRIGATION SYSTEM
LIVING WALL PANEL SYSTEM
GREEN ROOF

Natural Daylighting
Rainwater Collection Methods
Photovoltaic System
Site Grid Based off of 30' Neighborhood Housing Module

East Elevation
The St. Croix Marine Research Laboratory seeks to provide suitable facilities for researchers to study the rich marine life and coral reef ecosystems of the Caribbean. The laboratory campus invites the community and students of the University of the Virgin Islands to participate in educational seminars on marine issues.

The layout of the campus forms around two main axes that wrap around the Salt River Bay. The community programs exist at the entrance to the campus and as one moves south, the research laboratory spans across the peninsula and reaches out to both ends of the bay. The residential component sits at the end of the axes. This layout allows for a public to private transition as you move from the north end of campus to the south end.

The research laboratory is programmed into four sectors: wet and dry laboratories, a computer lab, and a classroom. The plans of the laboratories consist of teaching labs for individual researchers. Docks reside on the east side of the facility and observation desks on the west.

The design of the research laboratory takes sustainable approaches to meet net zero energy consumption. The design for the roof allocates the collection of rainwater into a cistern that rests below the deck. Integrated into the south facade is a photovoltaic system to produce energy for the laboratories. Operable doors and windows and a double facade allows applicable ventilation throughout the facility for thermal control. The facade consists of bamboo paneling to utilize a sustainable material found on the island.
Research Laboratory Floor Plan

Site Section
Cross Ventilation

Photovoltaic Wall System - South Facade

Rainwater Collection

North-South Section

Photovoltaic Wall System - South Facade
A group of fourteen Ball State University architecture students, led by faculty director Timothy Gray, took on the challenge of designing and constructing classroom and meeting facilities for the Indianapolis Project School, a non-profit charter school in downtown Indianapolis, IN.

The classrooms were constructed from recycled and repurposed shipping containers used for overseas shipping. After extensive cleaning, painting, and modification in Muncie, Indiana, the newly re-purposed containers were delivered on-site to Indianapolis, Indiana.

The buildings were designed to satisfy functional requirements but also to demonstrate sustainable building practices. The surplus of shipping containers that exists in the country due to the current trade deficit, along with their relatively efficient adaptability to a variety of building functions, makes them a choice well suited to the project. The buildings themselves will become educational tools, extending the agenda of the urban farm to that of the built environment and bringing lessons in sustainability and adaptive reuse to generations of Indianapolis students.

The biggest challenge of the project was cutting into the side of each shipping container to permit sliding doors that when opened, would create a central gathering space between the containers. The substantial weight required that the entire studio work together to lift the door into place. In addition, the studio fabricated all of the furniture for the classroom.
1. ENTRY GATEWAY/TOWER
2. NATIVE PLANTINGS
3. RAISED BEDS
4. CHICKEN YARD
5. GREENHOUSE
6. TOOLSHED W/ IDENTITY TOWER
7. COMPOST ZONE
8. CLASSROOM/MEETING ROOM
9. BEE HIVES
10. GREEN ROOF

Floor Plan
The following drawings are a study of the methods of communication in a variety of media. The drawings are images of Frank Gehry’s Guggenheim Museum Bilbao. These images were done in four different mediums: colored pencil, watercolor, graphite, and ink. The objective was to study four different perspectives of the building: the structure, interior, exterior, and its relationship to context, all while experimenting with the render capabilities of each medium.
Graduate Architecture
The University of Tennessee
August 2012 – May 2014

Trinity Lane Transit Village | 4
planET Park Installation | 12
Market Street Place | 22
Transitional Haitian Home | 36
The Urban Brewery | 44
Graphic Design | 56
The Trinity Lane Transit Village is the first anticipated transit stop outside of downtown Nashville on the proposed northeast corridor bus rapid transit line. The intention of the project was to assist the Nashville Metropolitan Planning Organization in envisioning the urban design implications of mass transit at a site within Metro Nashville. The program projection consisted of 2,400 residential units, 1.3 million square feet of office, and 86,000 square feet of retail.

This solution bridges the depressed Ellington Parkway to create a two story parking structure, a raised courtyard, and multiple connections between the west and east sides of the site. The bridging aspect references the precedent study of Clarence Perry’s design for a Five Block Apartment Development.

The raised courtyard provides a traffic free community space to accommodate the residential towers that flank it. Parallel to the residential towers are two pedestrian walkways that run north and south through the site creating a smart growth walkable urbanism. The north end of the site consists of mixed-use office and retail space that have shared courtyards at street level. The southern end of the site contains a combination of perimeter block, row, and duplex housing and recreational facilities. The building heights on the site step down from ten to twelve stories near the center to one to two stories towards the periphery as to not impose on the existing neighborhood fabric.

The BRT stop exists just north of Trinity Lane. The bus lane ramps up from Ellington Parkway to Trinity Lane to create a stop at street level. A park-n-ride structure with first floor amenity shops exists on the east and west side of the stop and are accompanied by public courtyards that create an enjoyable waiting space for transit users.

The overall site plan and BRT stop were designed as a team of two. For further development individually, I focused on the southern residential portion of the site and my partner developed the office and retail portion to the north.
The planET studio designed a greenway along the Second Creek Corridor that runs from north Knoxville along I-275 to downtown Knoxville until the creek empties into the Tennessee River.

Each student chose a site along the greenway to develop an installation that would improve the water quality of the creek and connect surrounding communities and neighborhoods to the greenway.

The installation presented is located at the north end of the greenway at the existing Mead’s Park site. A family park that is primarily dominated by baseball fields. Large channels and pipes run through the park that pump rainwater runoff from streets and fertilized yards directly into Second Creek. The proposed design for Mead’s Park incorporates a bio-retention pond and vegetative beds to improve the water quality of the creek, a natural playground to invite all ages of children and families to the park, and a gateway to welcome people to the greenway and the park. The gateway is elevated to provide views to the site and creates a transition point from the end of the greenway to the park and vice versa. Within the gateway is a bike repair shop, a small coffee shop and picnic area.

A study of local watersheds and catchment areas was completed to determine what and where hazardous particulates were flowing from to better incorporate on-site water treatment methods.
Market Street Place was a renovation to an existing parking structure in downtown Knoxville, TN. The existing roof of the four-story parking structure had caved in and the interior was flooded with rainwater and old debris. On street level, a few retail spaces along Church Avenue were still in use within the building. The structural system of the building is concrete post and beam with concrete slab. The roof of the existing structure was made of wood trusses that were rotten and structurally vulnerable when the team visited the site. One of the major challenges the building posed for redevelopment and renovation was the nonexistence of a structural column grid within the existing building.

As a team of five, we proposed the building be redeveloped into new retail and restaurant spaces on street level and residential lofts on floors two through four while salvaging the existing concrete structure. The existing site consisted of large surface parking lots so the team proposed future block development to improve the urban environment of the area.

The residential component was designed so that each loft had a private balcony that was created by setting the exterior wall of the loft back from the existing windows. A fifth floor was added to the structure to provide a community space and an outdoor roof terrace for the tenants.

The existing brick facade detail was kept in the renovation to preserve the old aesthetics of the building. The apertures at street level were redesigned to incorporate modern store front window facades. The aesthetics of the new additions to the structure were done in concrete and glass to distinguish between the new and old components of the building.
A8.04_Extensive Green Roof

- LIMESTONE COPING
- SILICON SEAL
- STAINLESS STEEL DRIP EDGE W/ ASPHALT FLASHING ABOVE
- ANCHORING SYSTEM, EYE HOOK DRILLED INTO CMU W/ PIN DRILLED INTO COPING STONE
- EXISTING BRICK
- EXISTING YELLOW BRICK VENEER
- GRASSES, PERENNIALS & SHRUBS
- SILICON SEAL
- RUBBER TUBE LINER
- SOIL
- PROTECTIVE LAYER/ROOT BARRIER
- GRAVEL
- WATERPROOF MEMBRANE
- INSULATION
- VAPOR BARRIER
- WAFFLE SLAB

A8.03_Green Roof to Concrete Deck Detail

- POLISHED CONCRETE DECKING
- GRASSES, PERENNIALS & SHRUBS
- PRE-CAST 1" CONCRETE OVERLAP
- SILICON SEAL
- RUBBER TUBE LINER
- SOIL
- PROTECTIVE LAYER/ROOT BARRIER
- GRAVEL
- WATERPROOF MEMBRANE
- RIGID INSULATION
- PROTECTIVE LAYER
- WATERPROOF MEMBRANE
- INSULATION
- VAPOR BARRIER
- WAFFLE SLAB
A8.06_Interior to Exterior Balcony

- Tongue & Groove Oak Flooring
- 1/2" Plywood
- 2" x 8" Wood Stud Framing
- 1" Rigid Insulation
- Nanawall Aluminum Model SL82
- Spaced Oak Flooring
- 2" x 4" Wood Stud Framing
- Steel Adjustable Pedestal

A8.05_Facade and Handrail Detail

- Aluminum Handrail
- Stone Cap with 3% Slope to Loggia and Drip Edge
- White Oak Deck Floor with 1/2" Spacing
- 2x4 Joists for Ventilation
- Flashing
- Waterproof Membrane
- Rigid Insulation @ 3% Slope
- Existing Brick Facade
- Concrete Beam
- Concrete Waffle Slab
- Stone Lintel
- White Painted Gypsum Wall Board
- Fiber Batt Insulation
- Steel Angle
- 4" x 4" Steel Tube
- White Painted Gypsum Wall Board
- Sound Absorbing Foam Spray Insulation
- Polished Nickel Light Fixture
- LED Light Tube
- Aluminum Handrail
- Stone Cap with 3% Slope to Loggia and Drip Edge
The goal of this seminar course was to individually identify, through research and precedent studies, a problem condition in the construction of Haitian homes and design/build a detail-scale strategy for its solution.

Through research, it was made apparent that Haitians construct their homes in phases which often leads to reduced structural stability. Once families save enough money for building materials, they will add rooms on to their existing home. In most cases, there is a lack of structural stability between the old and new structure due to Haitian construction materials and techniques. Traditional houses are made of CMU block, corrugated metal, and some wood. Haitians rarely use adequate rebar in their concrete construction and the little they do use, they leave extending outside the concrete form which rusts and becomes vulnerable.

This prototype studies a possible approach to creating a structurally sound connection between a new and existing structure. The design zooms in to the corner condition of a home where structural stability is often compromised. 1’x4’ wood modules interlock around a structural 2 3/8” steel pipe to form the corner. These modules can rotate around the steel pipe to connect to a future addition. This rotating feature allows the addition to be constructed and the connection made last. By using part of the existing structure as part of the new structure, material waste is reduced and the stability of the steel pipe always remains in tact.

This prototype, along with those explored by fellow classmates, will be documented and incorporated into the LIFEHouse Publication, a User Construction Manual that will help guide Haitian builders and contractors in providing safe, sustainable, and healthy living conditions.
STEP 1 - STEEL CORNER
CUT STEEL PIPE TO NEEDED LENGTH
CUT STEEL PLATE TO 6" X 6" @ ¼" THICK
WELD PIPE AND PLATE TOGETHER

STEP 2 - ROTATING MODULE
CUT 2" X 6" WOOD LUMBER TO 4' LENGTHS (2 PER MODULE)
DRILL A 2 ½" HOLE AT ONE END FOR STEEL TUBE TO PASS THROUGH
CONNECT WOOD PIECES TO CREATE MODULE

STEP 3 - SCREEN FRAME
CUT 2" X 6" WOOD LUMBER INTO 1 ½" SECTIONS
CUT 1 ½" SECTIONS INTO 2 - 3'5" LENGTHS AND 2 - 5" LENGTHS
ASSEMBLE FRAME
WRAP AND STRETCH SCREEN AROUND FRAME

STEP 4 - INSERT SCREEN INTO WOOD MODULE
INSERT FRAME
FASTEN FRAME TO WOOD MODULE
ATTACH LAST MEMBER OF MODULE

STEP 5 - FOUNDATION CONNECTION
FASTEN STEEL MEMBER TO CONCRETE PIER

STEP 6 - ASSEMBLE CORNER
STACK WOOD MODULES IN ALTERNATING DIRECTIONS

STEP 7 - APPLY CORRUGATED METAL
FASTEN STEEL MEMBER TO CONCRETE PIER
2X6 WOOD FRAME BUILT AROUND CONCRETE FOUNDATION AND CMU BLOCK WALLS

PLAN VIEW SHOWING TRANSITION OF ROTATING WOOD MODULES TO CREATE CONNECTION AND SPACE.

HAITIAN HOME AFTER ADDITION. STRONG CORNER AND CENTRAL CONNECTIONS.

Finished Prototype

CMU FOUNDATION/WALLS

4 - 2 1/4" STEEL PIPE AT CORNERS

STEEL PIPE FASTENED TO CONCRETE FOUNDATION

FASTEN CORRUGATED METAL CLADDING AND ROOF

CONSTRUCTED ADDITION - READY TO CONNECT BY ROTATING CORNER MODULES OF OLD STRUCTURE

HOUSE CONSTRUCTION UTILIZING PROTOTYPE

Constructing the Prototype

Constructing the Prototype

Finished Prototype

Finished Prototype

Finished Prototype

Finished Prototype

Finished Prototype

Finished Prototype

Finished Prototype
The Urban Brewery is located on an existing industrial brown site on the corner of Ogden Street and Depot Avenue near downtown Knoxville, TN and the Old City.

The requirements for the brewery process brought about a dense program on the site due to the need for double height space. In addition to the manufacturing space requirements, the program included a restaurant, bar, beer garden, gift shop, office space, a research pilot room, and a satellite classroom to teach community members about the brewing process.

The central core of the building houses the large fermentation tanks. The tanks are raised to the second level and encased in a glass facade to be displayed as a landmark for the area. The north end of the site is programmed with manufacturing space to take advantage of the alley and truck delivery routes. This layout enabled the public program to address the corner of Ogden and Depot to create a lively street front during the day and night.

The main structure of the building is concrete and is finished with pre-fabricated concrete panels on the manufacturing zone and undulating limestone panels on the public zone. The pattern of the limestone panels speak to the interior design and space requirements of the program. Within the building, glass curtain walls separate the manufacturing and public spaces to provide safety for visitors and efficiency for brewmasters while still enabling visual interaction between guest and the brewing process.
Parapet Coping
Roofing Membrane
Rigid Insulation (slope to drain)
Faced Batt Insulation
12X24 Concrete Girder
1” Wood Paneling
Wall Mounted Lighting
6” Limestone
4” Concrete Slab
4” Rigid Insulation
6X24 Concrete Beam
Supply Air Duct
Fluorescent Lighting
Steel Angle
18X24 Concrete Column
Pendant Lighting
Aluminum Storefront System w/ Translucent + Transparent Glazing
Finished Concrete
2” Thick Perimeter Insulation
4” Gravel
Perforated Drainage Pipe
2’X4’ Concrete Footer
As part of a graphic design course, spread layouts were designed that focused on image and text relationships. The project on the left was a one-page spread that represented the word line. The quote was given as a base for the project and an image was selected that best represented the quote. The layout of the text was then designed to best represent the image and the quote. The important words in the text were enlarged and positioned on the second page as the streetcar is positioned on the first page, creating a spatial relationship. The “S” in the enlarged words were then right aligned to represent the line in the phrase and in the image.

The following project is a design for a two-page spread. The Jean-Marie Tjibaou Cultural Center by Renzo Piano was chosen as the project to represent graphically. A font was chosen that best represented the tall pointed wood joists of the structural frame. The layout of the images and text were then framed by two curved lines that appear at the edges of the two-page spread to create the visual form of the curved shell.
RENO

RENZO

PIANO

JEAN-ALBERTE TIBAOU
CULTURAL CENTER

By Marie Térence-Fabrici

Renaissance for the radical environ-
ment, requiring for social design and
tecno-logic, takes place in the minds of
citizens. The Cultural Center of the
Island of Oleron, an exhibition and
showcase of the development of the
island to the 19th century, is in its
entertainment area.

To meet the needs of the concec-
tration of artistic and cultural
activities in the center of the
island, the space is divided into
three main areas: the exhibition
space, the theater, and the
restaurant.

The exhibition space is located in
the central part of the building,
and the theater is located in the
western part. The restaurant is
located in the eastern part of the
building.

The exhibition space is
organised into four parts:

1. The history of the island from
the 16th to the 19th century.

2. The history of the island from
the 19th to the 20th century.

3. The history of the island from
the 20th to the 21st century.

4. The history of the island from
the 21st to the 22nd century.

The theater is a multi-purpose
space that can host various
activities, such as concerts,
theater performances, and
exhibition openings.

The restaurant offers a
variety of dishes, and its
ambiance is designed to
complement the cultural
events held in the building.

The center has a total
floor area of 5,000 square
meters, including the
exhibition space, the theater,
and the restaurant.

The Cultural Center of the
Island of Oleron is an
innovative and sustainable
building that reflects the
values of the island.

The center is designed to
be environmentally friendly,
and it uses renewable energy
sources, such as solar power.

The center is also
equipped with a rainwater
harvesting system, which
reduces the building's
impact on the environment.

The center has received
several awards for its
innovative design and
sustainable practices.

The center is a
symbol of the island's
commitment to
environmental
sustainability and
social responsibility.

The center has
opened its doors to the
public, and it is a
cultural hub for the
Island of Oleron.

The center is
open to all, and it
welcomes visitors
from all backgrounds.

The center is
an example of how
innovation and
sustainability
are not mutually
exclusive, but rather,
they can coexist and
contribute to a
deeper understanding
of the world we live in.

The center is
a testament to the
power of collaboration,
and it brings people
from all walks of life
and backgrounds together
in a shared
quest for knowledge.

The center is
a reminder that
innovation and
sustainability
are not optional,
but rather, they
are essential
to our future.

The center is
a beacon of hope,
and it inspires
people to
think
bigger, act
more
courageously,
and create
a better
world.

The center is
a symbol of
resilience,
and it
reminds us that
even in the
face of
difficulties,
we can rise
above,
and
achieve
great things.

The center is
a celebration of
humanity,
and it
reminds us that
we are
capable of
greatness,
and
that
together,
we can
create
a better
future.

The center is
a reminder that
innovation and
sustainability
are not
millennia,
but rather,
they are
ongoing
processes
that
require
our
diligent
attention,
and
that
we
must
continue
to
innovate
and
sustain
our
world.

The center is
a reminder that
innovation and
sustainability
are not
debates,
but rather,
they are
actions
that
must
be
taken
now.

The center is
a reminder that
innovation and
sustainability
are not
abstract
concepts,
but rather,
they are
real
world
solutions
that
can
make
a
difference
and
improve
our
lives.

The center is
a reminder that
innovation and
sustainability
are not
impossible
goals,
but rather,
they are
attainable
visions
that
can
be
realized
with
our
collaboration
and
effort.

The center is
a reminder that
innovation and
sustainability
are not
optional,
but rather,
they are
necessary
to
our
future.
“men anpli chay pa lou”
many hands make the load lighter
Haitian Proverb