



New Science & Technology
Building

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## **Fayetteville State University**

#### **Presentation Outline**



Introduction

Concept

**Continuity and Support** 

**Design Innovation** 

**Energy, Efficiency + Sustainability** 

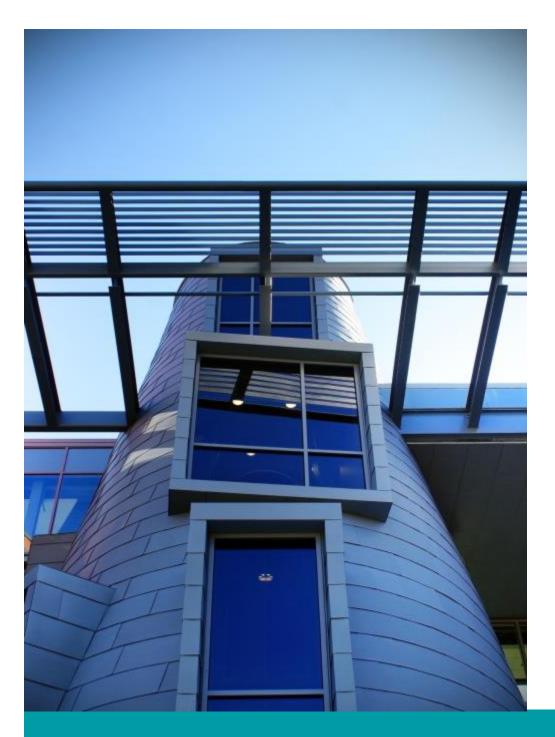
**Integrated Design** 

**Construction Process and Safety** 

**Quality + Excellence** 

**Final Comments** 





#### Introduction

Project Name: New Science &

Technology Building

Size: 60,000sf, 4 stories on 1.2

acres

**Budget:** Construction started

\$17,097,000.00 to \$20,655,025.00

Design Funding: \$1M.

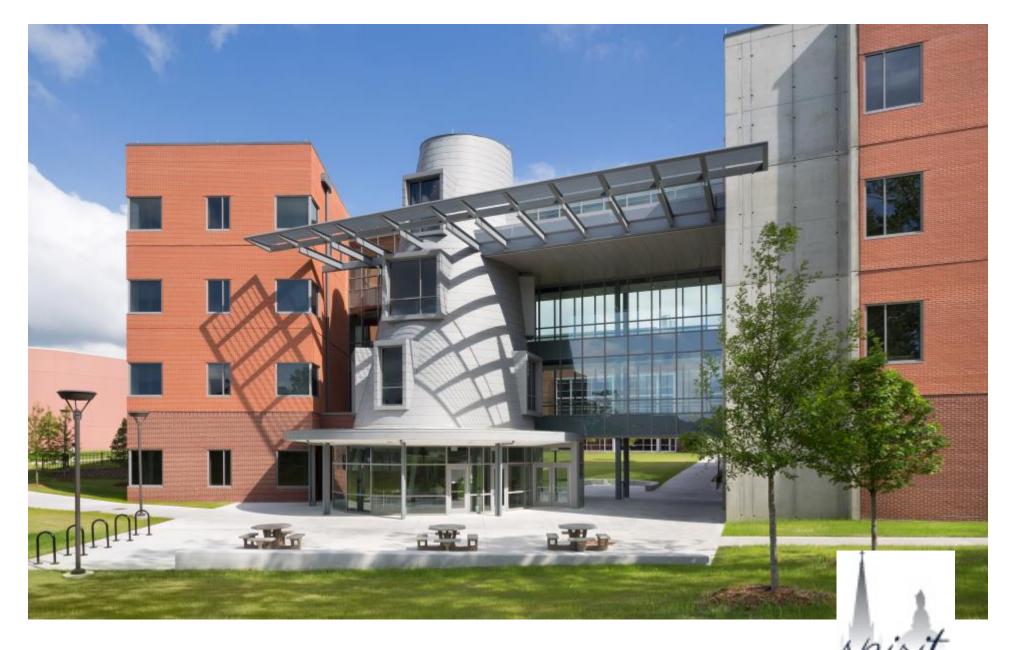
Funding Sources: COPS

(Certificates of Participation) State

Appropriated / Title III funding

Schedule: 06/27/11 Notice to

Proceed -- 12/16/12 Completion



New Science and Technology Building



#### Introduction

# The **2008 Strategic Plan**

"...regional university
that promotes the
educational, social,
cultural, and economic
transformation of
southeastern North
Carolina and beyond.
The primary mission...
provide students with the
highest quality learning
experiences that will
produce global citizens
and leaders as change
agents for shaping the
future of the State."

Courtyard View Facing Bridge Connector





## East – West Pedestrian Linkage

## Introduction Strategic Goals

Attract and retain faculty & staff

Enhance attractiveness to student

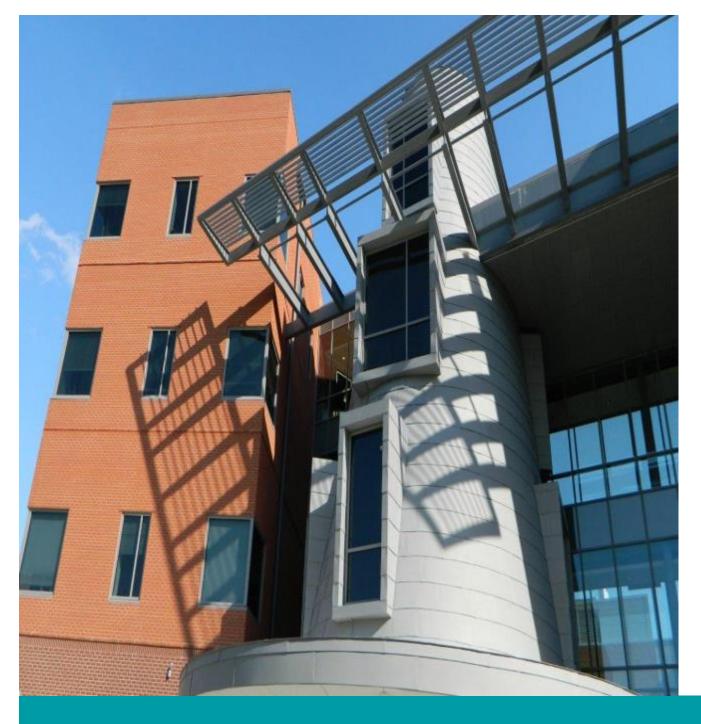
Increase retention and gradation rates

Improve facilities and technology

Sustainability

Intellectual and cultural center





#### Introduction

#### **New Initiatives**

FSU President's Climate
Commitment 2010

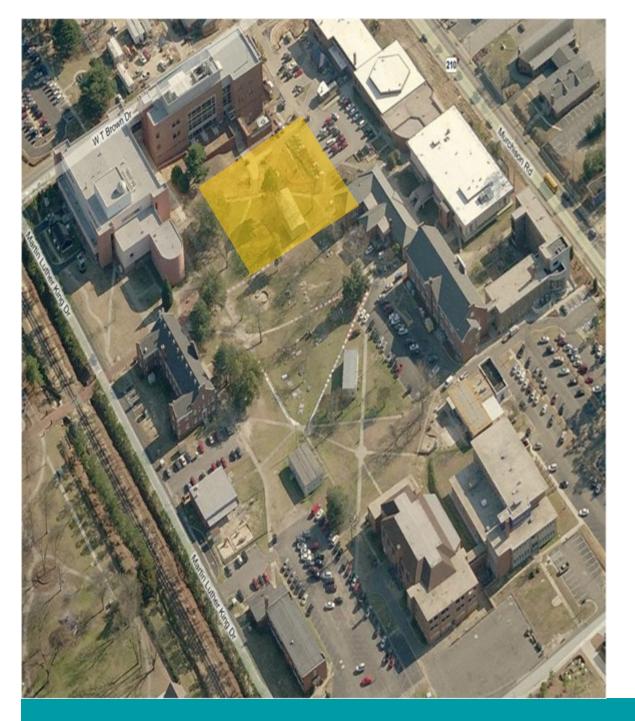
Energy & Water Plan 2011

Sustainability Coalition

2011 Sustainability Policy

Framework for future projects



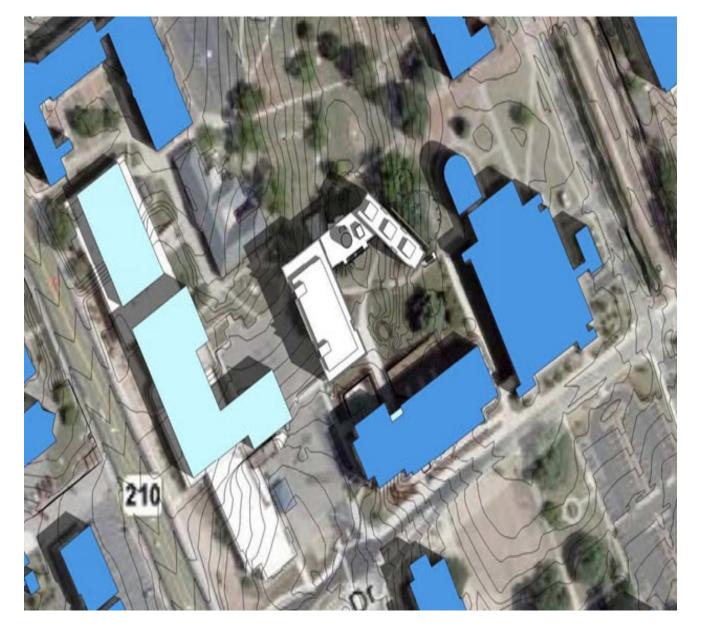


#### Introduction

## Budget

It was authorized by the State to begin the design phases in 2009.

Then project authorization was cut by 20,000 square feet and \$9.5 Million.



Site - Connection - Focal Point - Landmark

# **Concept** *Vision*

Science
Technology
Engineering
and Math
Complex



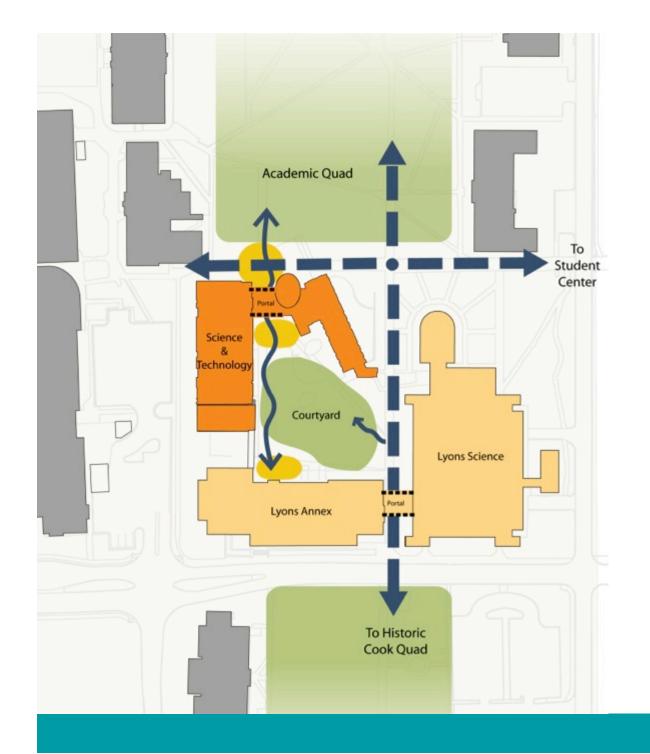


#### Master Plan 2008

#### *Initiatives*

- Building Site Selected
- Storm water management
- Campus Cohesion-Quadrangle + Courtyard
- Language of material & landscape





Transition from the Historical to the Contemporary Quad

Pedestrian linkages

"Iconic" building as focal point

Future stormwater garden quad

Science & Tech compliment two other science buildings

Courtyard for outdoor classrooms





# Historical Heritage Influencing Spirit of the Campus

Originally founded as the Howard School for African-American teachers in North Carolina

Founded in 1867 as the Teachers' Normal School

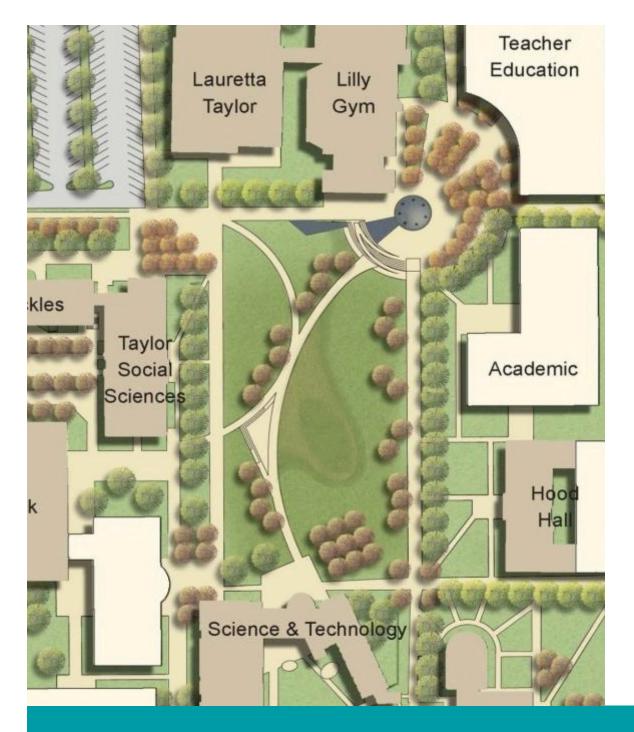
Second oldest university in the North Carolina University, System





Historical Cook Quad





### Academic Quad Renovation

The New Science & Technology Building will serve as the Iconic feature

The addition of new academic buildings and the creation of a unified open quad will feature:

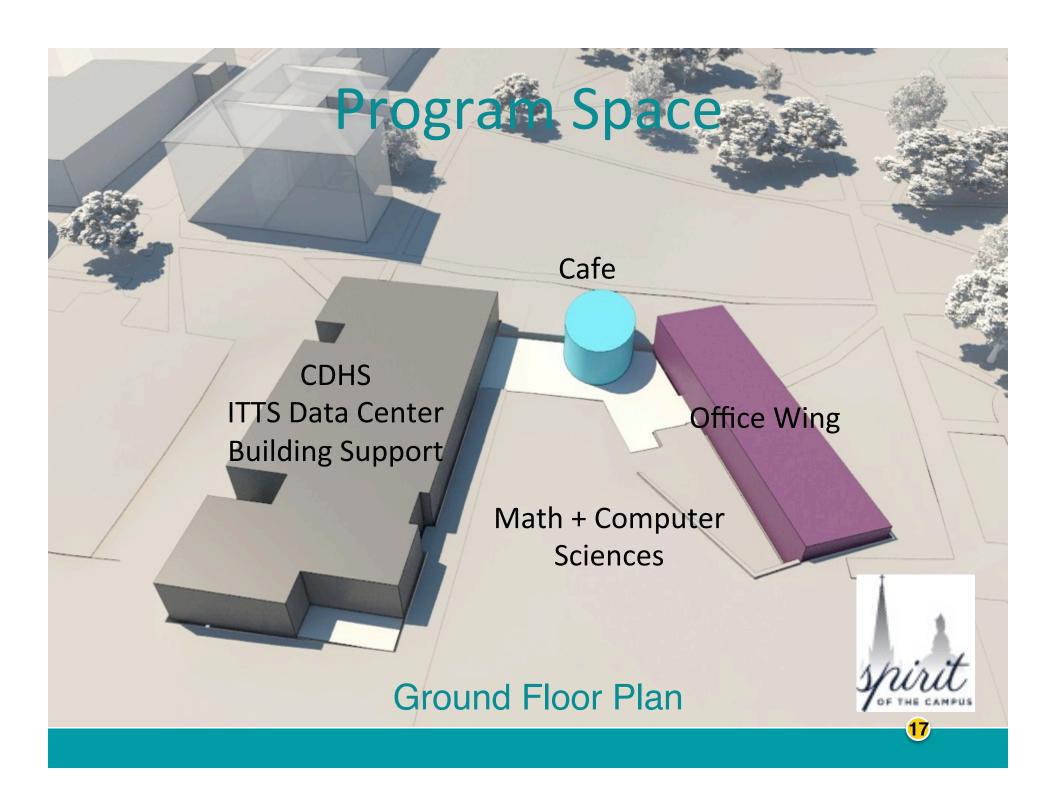
Founders Plaza

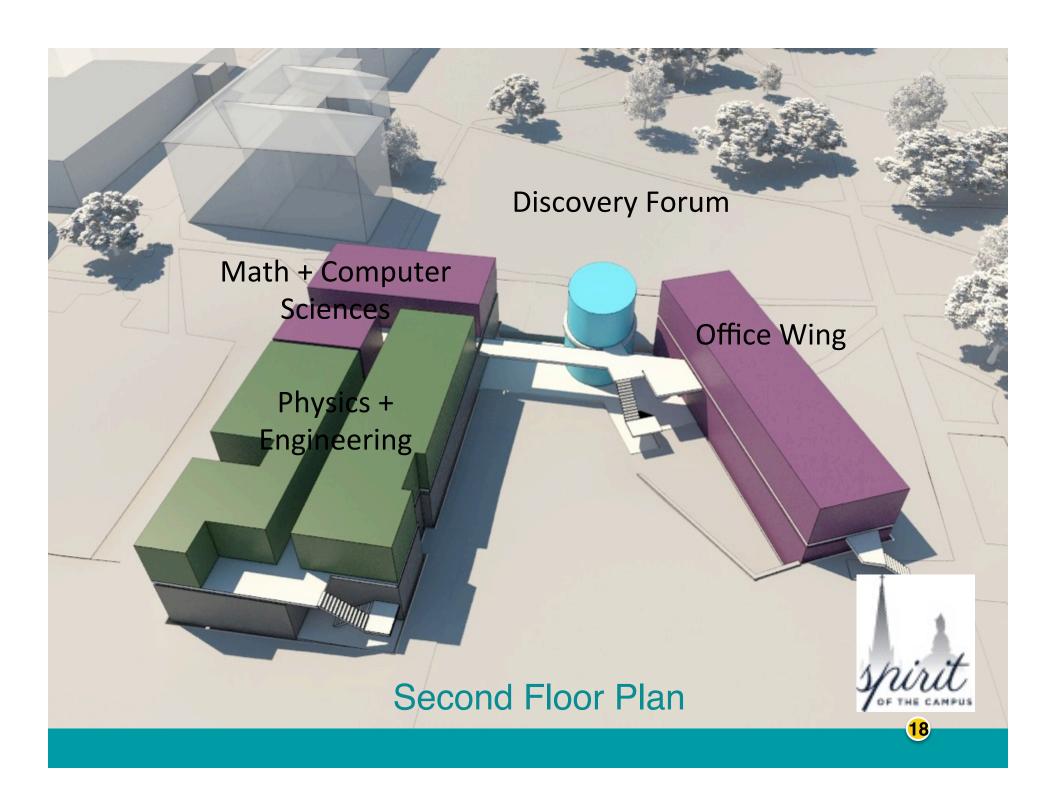
An innovative Stormwater Garden

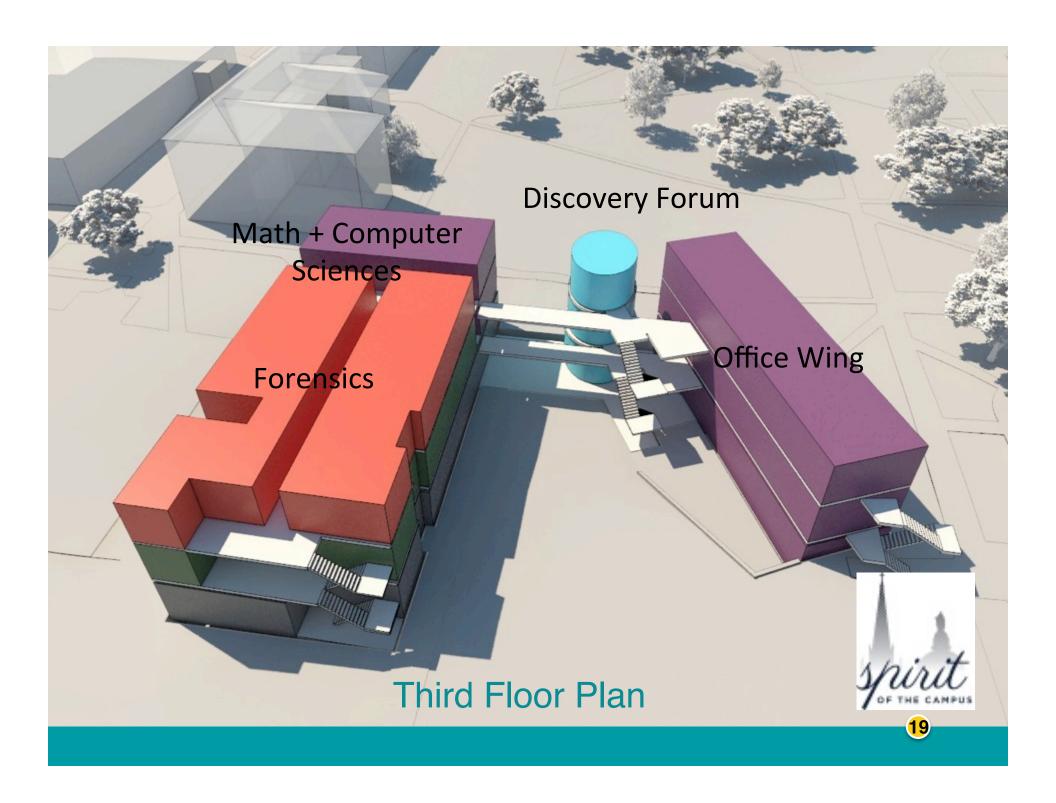
Major Gathering Space



Concept - Academic Quad

















## **Continuity and Support**

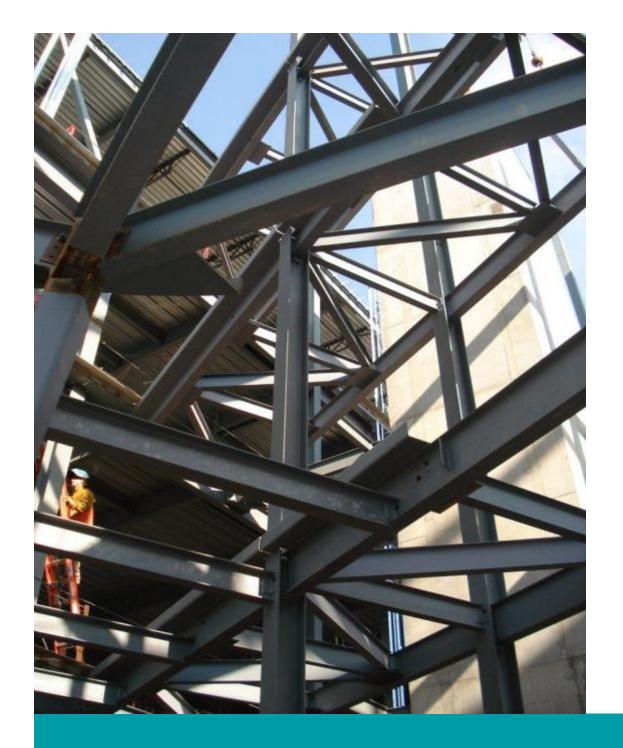
The success of an integrated approach

Started Project Delivery: Design Bid Construction

Ended Project Delivery: Design CMR Commissioning







# **Continuity and Support**

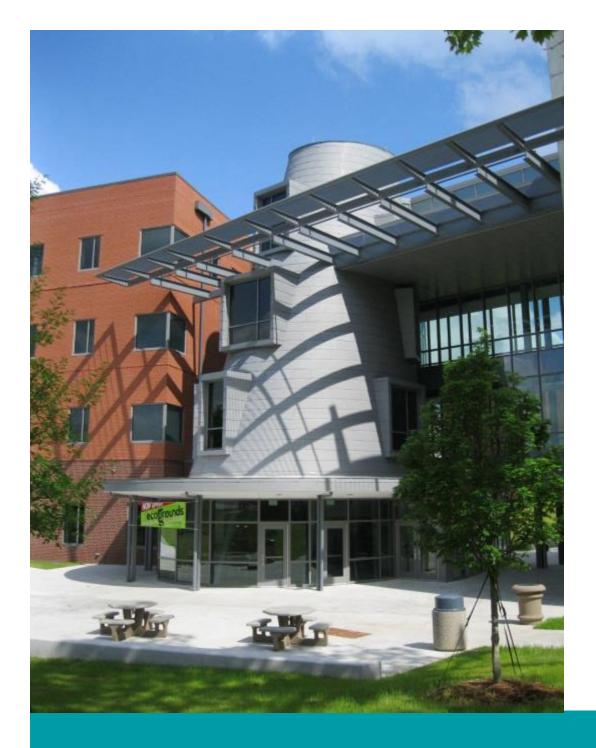
The success of an

integrated approach

Changes in:
Administrative
Leadership 3 Chancellors

Design Team
CMR on Site Rep





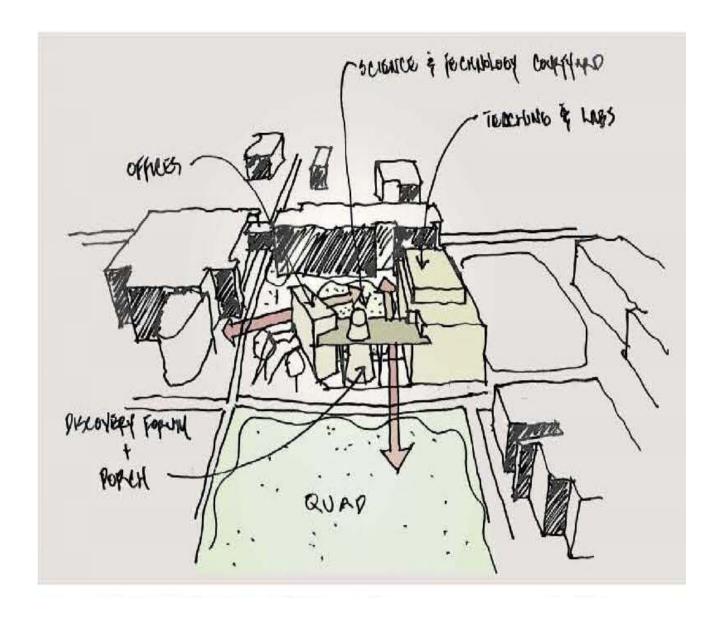
# **Continuity and Support**

The success of an integrated

approach

The "glue" uniting the vision and leadership



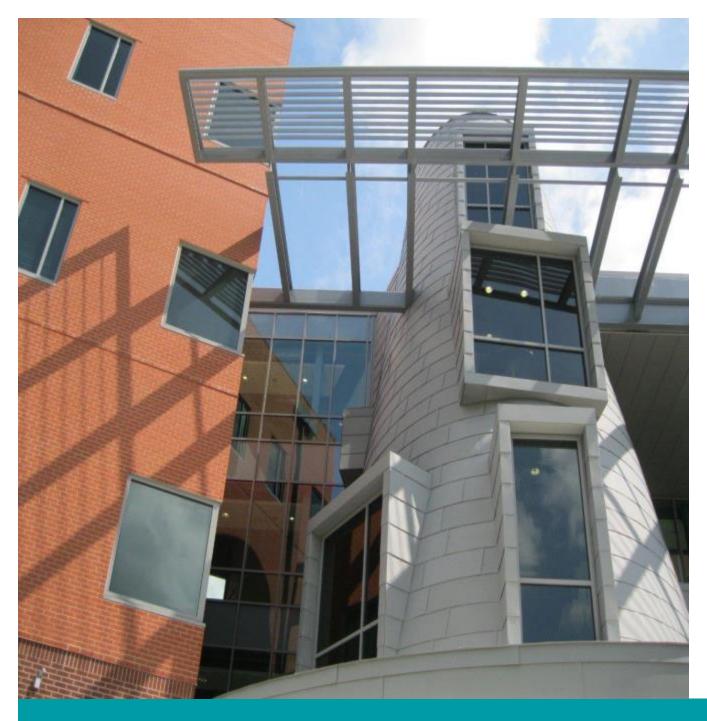


# STEM Complex

# Design Innovation

Function
circulation
Space
Light
Building systems
Structure
and site





# **Design Innovations**

The Conical
Zinc-clad
Discovery Forum

Social Hub Students Faculties

Landmark for Campus

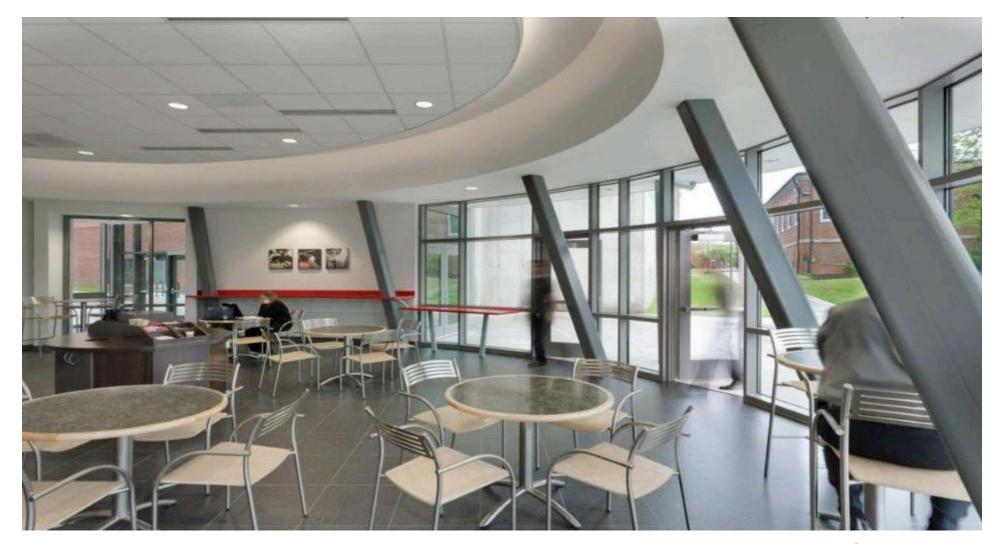
1<sup>st</sup> Floor Café Acts as Informal Lobby

Upper Floors Seminar Rooms Space

Light
Building Systems
Structures
Site

"Front door" to the main quad





# **Design Innovation**

Discovery Forum

(No Formal Lobby)

Café: social hub + cultural hub+ campus hub



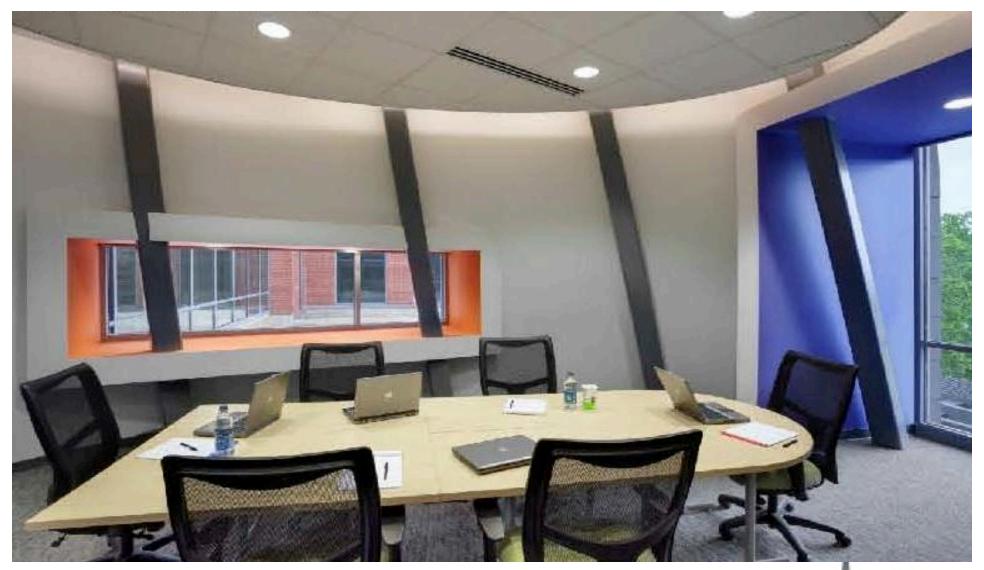




**Design Innovation** 

Discovery Forum - Bridge

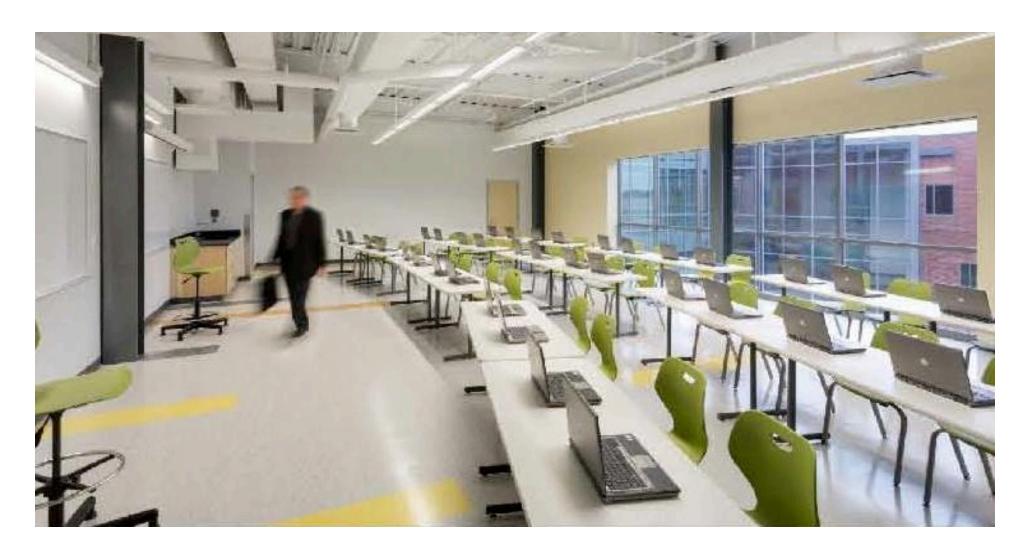




# **Design Innovation**

Discovery Forum - Seminar Room





# **Design Innovation**

Classrooms and Laboratories are tall, airy spaces with generous windows. Open ceilings promote building flexibility, ease of maintenance, engaging students in the ways of science, energy and sustainability.





Energy Efficiency + Sustainability

LEED Silver + Life Cycle Cost Analysis + Multiple Sustainability Strategies

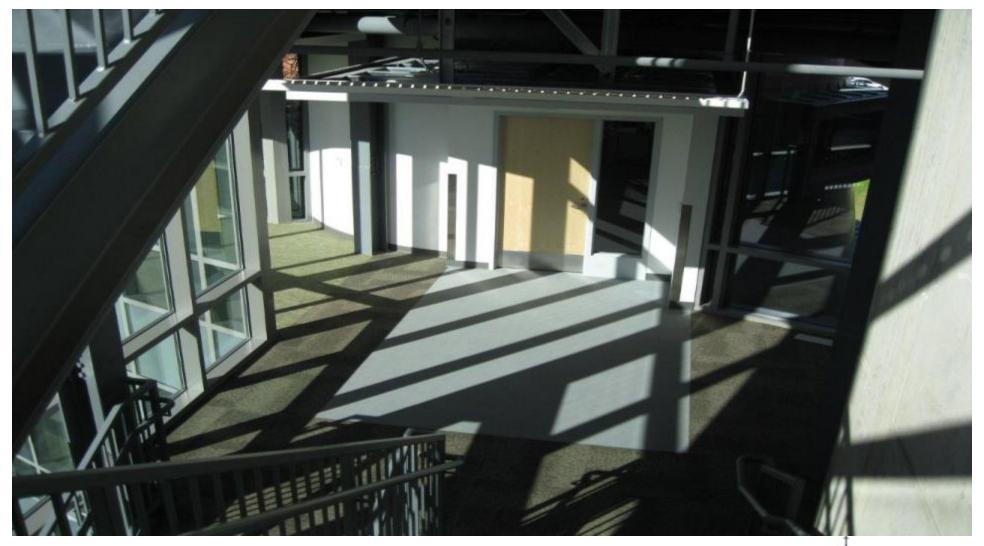


- Large expansive windows in the classrooms which delivered an abundance of natural light
- High performance glazing and building envelope
- High efficiency water cooled centrifugal chillers
- High efficiency condensing style boilers and water heater
- Variable air volume laboratory exhaust system with heat recovery
- Variable volume air and water distribution systems
- Low flow plumbing fixtures
- Bike racks and courtesy shower stalls

## **Energy Efficiency + Sustainability**

LEED Silver + Multiple Sustainability Strategies





# **Energy Efficiency + Sustainability**

"Open" Building Systems

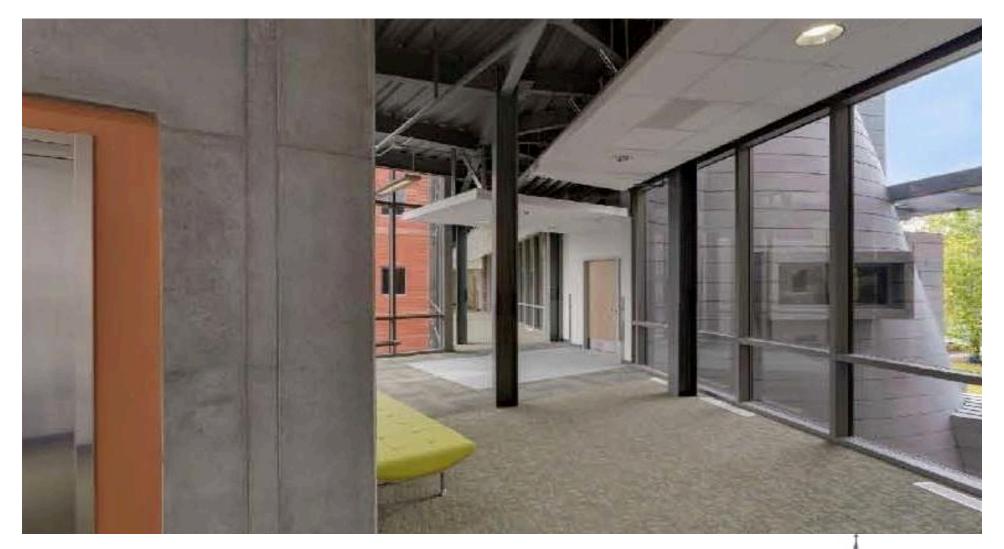




Energy Efficiency + Sustainability

"Open" Building Systems + "grab bag" Carpet Tiles





#### **Energy Efficiency + Sustainability**

Original intent was to finish the floor with sealed concrete throughout the administrative wing...Concerns were raised...work with Mohawk Carpets with their "grab bag" program to bring carpet tiles with high quality remnant tiles.



#### **INTEGRATED DESIGN**

(collaboration + partnership = TEAM)

**Budget Reduction Challenges** 

Unexpected Soil Remediation Effect:

Value Engineering
"Cone" Construction
Bridge Re-design

Opportunity Inspired
Designer, CMR and Owner to
fulfill project goals



# INTEGRATED DESIGN

(collaboration + partnership = TEAM)

Bridge Re-design to Curtain Wall – Clad





# **Construction Process & Safety**

(coordination and information)

Construction Began August 2011

Construction
Administration Phase

- Limited Contingency
- Soil Remediation Hit
- Excavation Revealed
  - Water Seepage
  - Class "C" Soil



# **Construction Process & Safety**

(coordination and information)

Construction
Administration Phase

 Safety in Heart of Campus





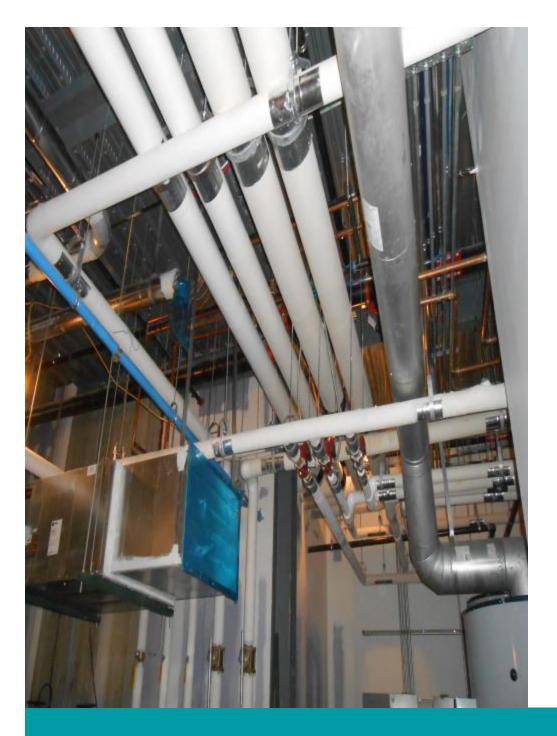
# Construction Process & Safety

(coordination and information)

## **Construction Administration Phase**

- Poor As-built revealed
  - High VoltageElectrical Lines
  - Live Natural Gas
  - Fiber-Optic Cables
- Research Uncovered
  - Creek used to run thru site in 1920 drawings





## Construction Process & Safety

(coordination and information)

Solutions: How to save the day?

University Architect mandated weekly conference calls to prevent items from "falling off the radar" and provide team accountability.

The spirit of camaraderie and doing what was best for FSU and the project during the Construction Administration Phase was clearly evident. It was truly a positive experience for all team members.



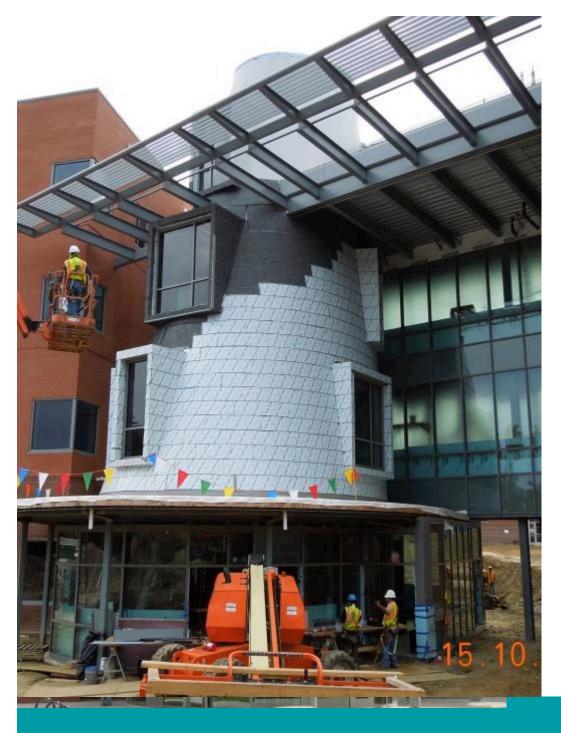
(extraordinary attention to detail)

## Particular Building Design

- Exposed shear walls
- Zinc-plated elliptical cone
- Long uninterrupted expanse of brick
- Curtain wall-clad bridge







(extraordinary attention to detail)

#### The Cone

The zinc-plated cone presented the single most challenging building detail with respect to construction quality

"Constant radius application of material is one thing — an elliptical application with a constantly changing radius is another."

#### The Eyebrow

The steel powder-coated "eyebrow" feature protruding from the top of the cone

The structure supporting the "eyebrow" is the same structure that creates the cone



(extraordinary attention to detail)

### Mechanical Systems/Fume Hoods

The system provides instantaneous makeup air for the building's 39 fume hoods

(2 teaching labs contained 13 of the 39)

Lab-quality humidity control for lab testing air

Additional cooling for the campus Data Center

Commissioning



(extraordinary attention to detail)

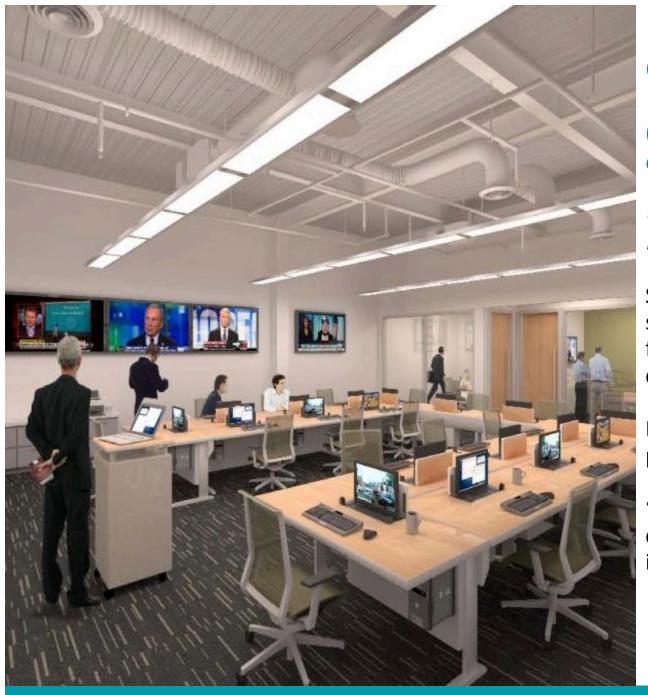
#### New University Data Hub/ Center

**Humidity control** 

Emerson "Smart Row" data center into a single in-line IT rack system

Liebert GXT True Online Uninterruptable Power Supply (UPS) system

Self-contained fire suppression system versus total room suppression system



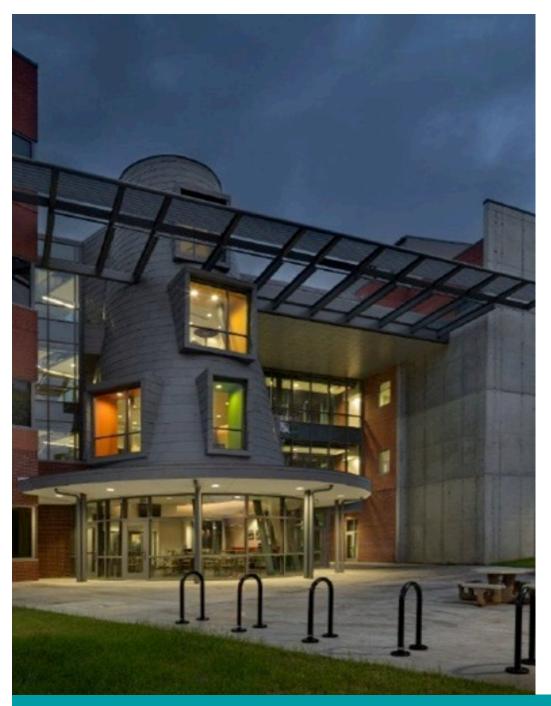
(extraordinary attention to detail)

### Center for Defense & Homeland Security

Space available when large seminar room was eliminated from the Office of State Budget cut

Funding from other source provided opportunity for CDHS

"State of the art" communication system were installed



#### **Final Comments**

The new Science and Technology building at FSU is the culmination of efforts by an outstanding project team effort from start to finish... this is one of those rare instances where the end product turned out to be greater than the sum of its parts.

"Excellence in Project Implementation"
Merit Award by State Building
Commission of North Carolina

This recognizes the project coordination of both the design team and the construction team. This project had both excellence in design and excellence in construction and overall project implementation