NATIONAL COUNCIL OF SCHOOL FACILITIES

culture, climate, crisis + curriculum:

2:35 -3:15 ET
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Introductions

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DLR Group

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Setting the Stage: Sustainability

Design & Sustainability

Our design choices have an impact at all levels.

Our design choices impact all categories.

Environment is everything around us including us while the ecology describes how all those work.

Ecology looks at the interaction between everything.
Building capacity to recover quickly from difficulties

Increasing the resilience of a system makes that system more sustainable, but increasing the sustainability of a system does not necessarily make it more resilient.
This map denotes the approximate location for each of the 16 separate billion-dollar weather and climate disasters that impacted the United States from January–September 2020.
A Framework: how can we better prepare our students for the now, near and far

**NET ZERO WATER APPROACH**
- respect hydrology
- reduce need
- assess quality
- clarify perception
- localize closed loop
- address demand
- generation and delivery of energy and water
- renewables and storage
- demand and controls
- HVAC systems
- lighting
- envelope
- programming

**EMBODIED RESOURCE FLOW**
- assess life cycle
- prioritize high volume
- avoid high impact
- material innovation
- carbon sequestration
- downstream upcycling
- design for disassembly

**HEALTHY MATERIALS**
- assess exposure & vulnerability
- prioritize high volume
- avoid high impact
- holistic human development
- design for inclusion and universal design
- intellectual & vocational resilience
- social, emotional & spiritual resilience

**COMMUNITY HEALTH**
- food
- education
- healthcare systems
- socially just and culturally rich
- community & social context
- economic stability
- neighborhood and physical environment
- build capacity to reconcile

**ECOSYSTEM HEALTH**
- assess interconnectedness
- physical and environmental resilience
- financial resilience

**HUMAN HEALTH**
- building and neighborhood scale
A Framework: how can we better prepare our students for the now, near and far

A framework of FOUR drivers for building engaged learning through a better understanding of the need for equitable and resilient 21st century schools and curriculum?

- learning environments that enable
- responsive building systems
- student empowered learning environments and curricula
- community/not for profits role in operating costs and return-on-investments
US VIRGIN ISLANDS
DEPARTMENT OF EDUCATION (VIDE)
a case study: context, culture, climate, crisis
+ curriculum
Design Solutions: Applying a framework for curricula

- socially just, culturally rich, healthy and resilient community
- understanding vulnerabilities
- defining equity
- aligning VALUES
- developing interventions
how do we envision a socially just, culturally rich, healthy and resilient community?
Setting the Context: VIDE Schools

- Whole Child
- Equity
- Addressing the Needs of All Students & Integrating Technology
- Using Technology to Assess the Impact of Practices
- Health, Safety & Security
- Cultural, Local & Economic Competence and Resilience
- Integrated Design, Assessment, Operation & Management

"The Virgin Islands Department of Education embraces ALL students and empowers them to achieve their fullest potential."

VIDE Vision Statement
Setting the Context: Addressing equity through architecture and curriculum

2. Shearing Layers
   https://shearinglayers.com/focus/the-very-next-step/
Setting the Context: A Historic Vernacular
Design Solutions: Design Interventions

Colors and textures of St. Croix – Arthur A. Richards PreK-8 School

“Visual surprise is natural in the Caribbean; it comes with the landscape, and faced with its beauty, the sigh of History dissolves.”

Derek Walcott
Caribbean Poet & Nobel Prize Winner
**Design Solutions: Design Interventions**

**Site: Outdoor Learning**
Rooted in its place and studied through the user experience.

1. Tapestry Walk
2. Outdoor Learning Classrooms
3. Permaculture Gardens
4. Amphitheater/Community Asset
5. Outdoor Play
Design Solutions: Applying a framework for curricula

Thru Inquiry-based learning
Design Solutions: Design Interventions

Concept – Kit of Parts

Establishing a kit of parts rooted in the vernacular of the U.S. Virgin Islands:

1. Oculus within Traditional Hip Roof
2. Breeze Block Patterns
3. Brise Soleil Shading Fins
4. Perforated Metal Guardrail
5. Color Accent
6. Punched Opening (With Shading)
7. Custom Wall Murals

Early design interpretation of architectural vernacular.
Design Solutions: Design Interventions

Concept – Campus/Building/Program procession experience
**Design Solutions:** Design Interventions

**Resilient – net-zero energy ready**

Summary of Shading and Daylight Summaries:

Detailed shading and daylight studies demonstrate the oculi will allow for 100% daylight spaces in the learning areas.

Below: Shading and daylight study at ARPKB learning suite.

Right: Left: Agreement in learning zone via models.
Design Solutions: Developing a framework for curricula
Thru connected networks
Design Solutions: Design Interventions

Colors and textures of St. Thomas – Charlotte Amalie High School
Design Solutions: Design Interventions

The “Carnival”: A Learning Extravaganza
Design Solutions: Design Interventions

Concept – Kit of Parts

Conditioned spaces include only the programmed spaces which rely on full climate control. These form the interior ‘heart’ of learning spaces while the Carnival forms the exterior ‘spine’ of learning.

Transitional spaces are covered within the main building massing which form a gradual connection between fully air-conditioned interior spaces to outdoor learning spaces.

Transitional spaces are programmed flexible learning environments that allow open connection to the outdoor front porches weather permitting.

Covered front porches are located to maximize views and natural trade winds while remaining accessible to all of campus.

Deep Overhangs cover the front porches to provide protection from the sun and rain while also creating relief in building massing with views into the transitional spaces.

The Carnival forms the exterior ‘spine’ of campus connecting all building entries via accessible routes and celebrating the unique landscape and culture of the islands.
Design Solutions: Design Interventions

Concept – Kit of Parts

Building Components

- **Masonry Veneer System**: Provides a durable envelope antimicrobial, providing soaking and movement of facade.
- **Operable Exterior Glazing Wall System**: Allows transitional acoustic glazing over awnings during the season, with trap cooler exhaust air from builtspace. Temper air and make space more comfortable.
- **Traditional Hipped Roofs**: Emulate spatial verticals, architecture with predictable means of protection from horizontal force winds and downpours.
- **Vertical占比 Pins**: Provide protection from prevailing sun and are angled at an optimal 45 degrees, sustained trade winds from mountains.
- **Breez Block Wall**: Provides privacy between transitional walking spaces and picnic areas, creating amazing light patterns throughout the day.
- **Aluminum Stainless Steel Mesh Guardrail**: Systematic maximum airflow and serenely frames while providing a scale and rhythm to outdoor spaces.
Design Solutions: Design Interventions
Procession – unconditioned to conditioned
Design Solutions: Design Interventions

Procession – unconditioned to conditioned
Applied Learning: Career Technical Education

Enhanced Career Preparedness in the VI: Potential Pathways for All Students

- Business Services
  Entrepreneurship
- IT & STEAM
- Infrastructure Engineering
  Carpentry, Masonry, HVAC, Electrical
- Energy & Industrial Technology
  Energy, Renewables, Agriculture
- Hospitality & Tourism
  Culinary, Hotel Management, Eco Tourism
- Health & Wellness
  CNA, Behavioral, Cosmetology
- Welding Technologies
- Education
- Performing Arts
Pathways and Curriculum

Advanced Manufacturing  Business Services  Infrastructure Engineering  I.T. and STEAM

Hospitality and Tourism  Health and Wellness  Transportation (Automotive)  Transportation (Aviation)
Design Solutions: Design Interventions
The Colors and textures of St. John – Sprauve PreK-12
New Build Recommendation: St. John Sprauve Prek-12

New Building 108,463 SF
New Capacity 460 Students (Additional 331)
GOAL: To create a learner-centered, inquiry-based, future-ready school that is off the grid and can support its own needs for energy, water, fire protection and sewage while maintaining as much of the natural environment as possible and teaching lightly upon the land so as not to disrupt the native ecology and hydrology.
Drivers of the Need: for social and emotional resiliency in the Virgin Islands

crises

2020 IBC special wind zones

- 2020 IBC special wind zones
- vernacular architecture
- innovative use of natural light

- outdoor learning places
- net zero ready
- cisterns
- photo voltaic
- building systems dashboard

- thermal envelope that is mold resistant
- mildew and mold

- creation of mini-eco systems
- storm strong

- 501c's
- FEMA Shelter

- bi-partisan budget act
- introduction of passive systems
- definition of FEMA industry standards

- food and water as a resource
- water resource institute, uvi
- marine + environmental studies, uvi

- an engaging master plan process
- CTE/industry partners

- storm strong
- CTE/industry partners

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### A Framework: How can we better prepare our students for the now, near and far

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Drivers of the Need: for social and emotional resiliency

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- crisis
- architecture that enables
- building Systems
- curricula
- community engagement
Drivers of the Need: For social and emotional resiliency

- Crisis
- Architecture that enables building Systems
- Curricula
- Community engagement
Policy and Practice: Resiliency for social and emotional resilience

Fig. 1. Resilience as a component of sustainability. Proponents of this organization structure assert that systems that are more resilient can better achieve and maintain sustainable operations.

reTHINKING
K-12 EDUCATION

now  near  far

people
buildings
businesses
infrastructure

pandemic  hurricanes  fires  tsunami  landslides  volcanos