LEARNING ENVIRONMENTS
Enhancing the Educational Experience

New Horizons at
18°20'N 64°44'W

Date: 11.01.2025
Time:9-10;30am

VIRGIN ISLANDS JULIUS E. SPRAUVE

JULIUS E. SPRAUVE
PRE KINDERGARTEN THROUGH 12TH GRADE

SAINT JOHN
JULIUS E. SPRAUVE SCHOOL

SAINT JOHN VIRGIN ISLANDS
JULIUS E. SPRAUVE

JULIUS E. SPRAUVE
PRE K THROUGH 12TH GRADE

New Horizons at 18°20'N 64°44'W
Date / Time: November 1, 2025 | 9:00 am – 10:30 am

Room: 164-165

Audience: Architects, Engineers, Educators, Facility Personnel, Contractors / Suppliers / Manufacturers, Consultants

Call to Action: Leave the session with an understanding of how the impact of place can elevate a design solution, considering all elements of a site to the natural beauty of the surroundings. They'll also hear new and proven ideas to achieve resilient, high-performing schools in any environment.

Abstract: A unique culture and context, a unique story and certainly a unique PreK-12 program for a maximum of 550 students on St. John, USVI that turns challenges to opportunities while also leveraging unique funding streams that are centered on resilience. The site is located at 18°20'N 64°44'W with approximately 4,000 residents located on this 20 square mile island. The United Sates Virgin Islands is leveraging the unique opportunities afforded by FEMA funding for prudent replacement of public buildings post Maria/Irma with a vision to transform. Through the development of Vision 2040, the Virgin Islands Economic Development Authority (USVIEDA) in the spirit of collaboration, led a Task Force of government officials and agencies, local non-profits, and stakeholders was assembled to oversee the vision. Vision 2040 will reinforce New Horizon for Learning Environments. Join us to hear the journey of discovery, planning and design that resulted in the transformation of the US Virgin Islands School District with a particular focus on the Julius E. Sprauve PreK-12. Based on all of the unique requirements for resiliency, Sprauve is seeking Living Building Challenge certification. We will be presenting how the vision for education in this special place that requires a robust approach to resilience aligns with the four core foci that and their related imperatives of place, education + inspiration, beauty + biophilia, and water + energy.

Learning Objectives:
1.Hear the impact of place during this session. The site slopes over 130 feet from the northern most location of the building to the low point adjacent to Highway 10 on the south side of the site. This large change in elevation led to the creation of a series of bridges and connections across the site to make the site and program accessible connecting the various buildings and their respective teaching and learning opportunities, always considering the views both internal and external of the site.
2.Understand the team's unique approach to curriculum that combines core academics and career and technical education within the parameter set by the National Parks Service's MOU for a historic land swap that provided the land for a new school.
3.Explore the new Sprauve PK-12 campus that combines a light building footprint, resiliency, and innovative building systems to create a flexible and forward-thinking learning environment for the students, faculty, and St. John community. Working with the site's steep topography, the building is designed to grow from the earth (Grotto) to the sky (Altana) with various opportunities for discovery along the journey.
4.Discover the requirements for working building systems and how they informed the design of this LBC building. Net positive energy systems will feature a combination of high-performance building systems, including both active and passive strategies. Everything from water collection and treatment for potable water, waste treatment on site, ventilation and air conditioning systems which were designed to be energy efficient. In addition, the PV panels are provided to allow 100% on site generation of the school's power needs with batteries and battery storage infrastructure to allow continuous operation of school when power from PV panels is not available.

Core Competency: Design of Educational Facilities
Aligning Educational, & Community vision with design to support a regenerative mindset for a sustainable and future ready Educational Facility.

Agenda

01 Culture and Context
02 Design Concept
03 Interiors
04 Connections
05 Lifelong Learning
06 Water
07 Energy
08 Resilience
09 Equity and Inclusion

Speakers

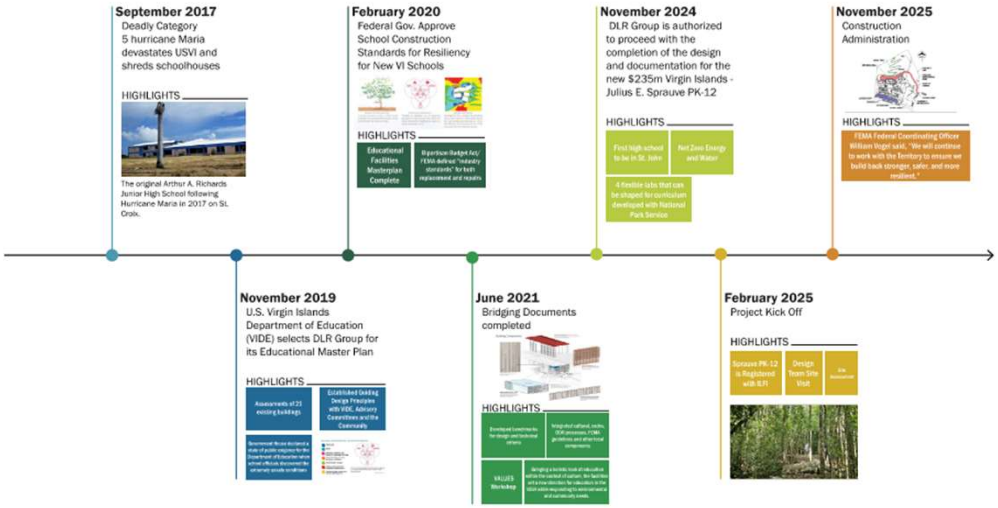
Pam Loeffelman, FAIA
DLR Group
Matt Brehmer, AIA
DLR Group

Pam Loeffelman, FAIA
DLR Group
Llyod Ramsey
DLR Group

Dr. Spurgeon, Superintendent
West-MEC, Phoenix, AZ

Context + Culture

Timeline

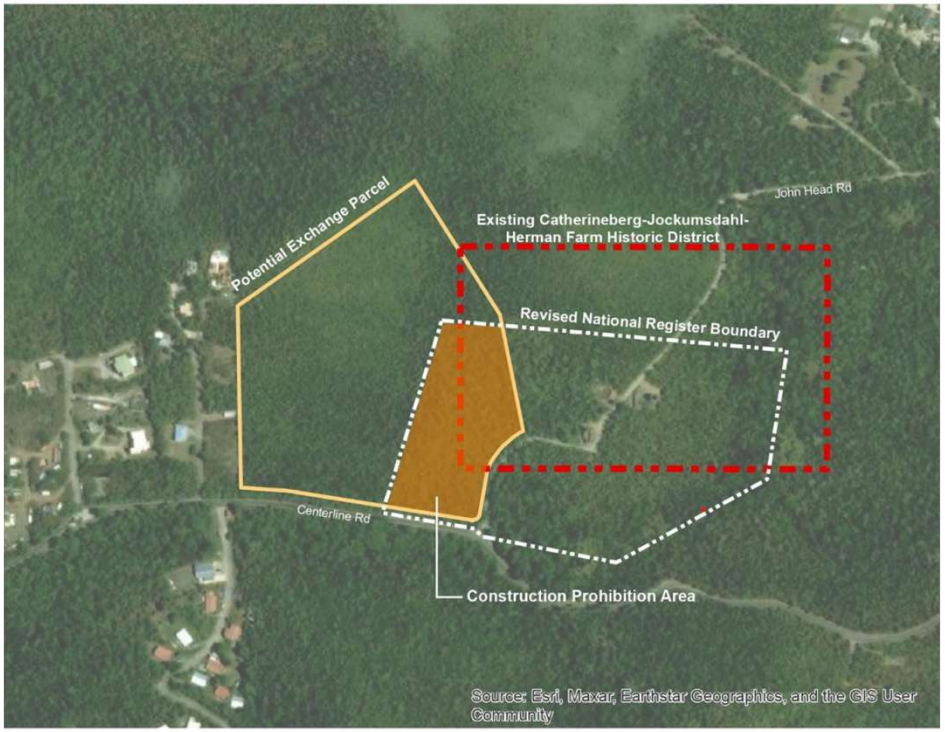


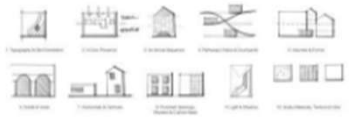
01

CULTURE + CONTEXT

Understanding the Roots

1977 Catherineberg-Jockumsdahl-Herman Farm Historic District





Comprehensive Adaptive Plan - Baseline

ABSENCE OF THREATS:
There has been no dumping observed on site, but there could be remnant chemicals from the site's previous use as a sugar plantation. More information will be gleaned from the soils report once completed. The presence of residential homes is a potential source for pollution throughout the life of the project. No invasive species were observed, and the biological system seems healthy and natural. Human use of the site has dropped off since the dissolution of the sugar plantation, and the site benefits from a remote location. Use of the site will increase when the site is developed as a school.

PHYSICAL CONDITIONS:
There is potential of residual chemicals and deteriorated soil health on the site due to its history as an agricultural site and the surrounding residential areas. However, close to 200 years have passed since the site supported a functioning sugar plantation and the physical substrate has had time to recover well.

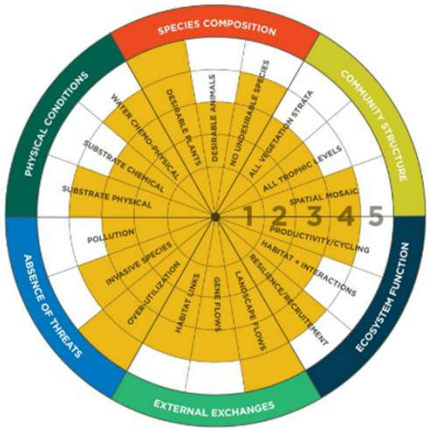
SPECIES COMPOSITION:
The range of flora on site appeared healthy and part of a functioning system on its way to maturity. The species seemed varied and the distribution pattern appeared to be natural. No undesirable species were observed on site.

COMMUNITY STRUCTURE:
Due to the site's history as a sugar plantation up until the 1800s, the vegetation is still in the process of regrowth. However, there is a good variety of species present on site to support this succession and the regrowth appears to be ongoing and happening at a healthy pace.

ECOSYSTEM FUNCTION:
The habitat here has recovered well from its history as a plantation, but still has a way to go. Luckily, it is part of a much larger preserved forest system that is able to cycle resources (See external exchanges below). With the adjacent National Park, the site is unlikely to ever be "landlocked" by development and will remain a section of a larger functioning habitat.

EXTERNAL EXCHANGES:
This site is adjacent to a national park where very limited development is expected. Natural plant and animal systems are well connected and are able to support a diverse range of native flora and fauna.

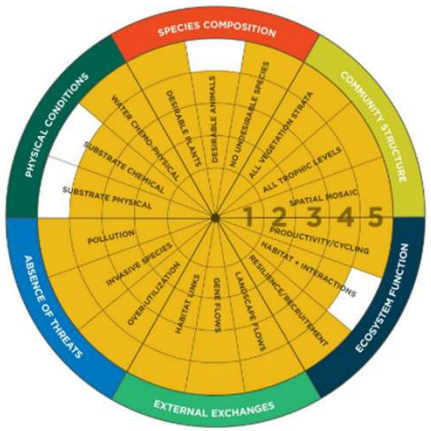
SENSITIVE HABITAT BUFFERS :
There is a ghut (intermittent stream) running across the site that needs to be preserved to support the surrounding ecosystem. Other than this, there is no surrounding old-growth forest on site, as everything in the area was once part of the Catherineberg sugar plantation.



Comprehensive Adaptive Plan - Target Restoration Goals

ABSENCE OF THREATS:
By placing a school on this site, managing overutilization will be important – the school should be light on the ground and support regrowth in any areas disturbed by construction. Additional measures will be taken to mitigate any pollution during construction, including barriers to prevent erosion and sediment pollution since the site is located on a hillside.

During construction, invasive species can be identified and removed, and native plants can be added to further support a healthy ecosystem.



PHYSICAL CONDITIONS:
There is a heritage tamarind tree on site that will be preserved with a large buffer around it. It is located in a portion of the site that also serves as the burial grounds for the enslaved community and thus holds deep cultural significance for the local community. There is also a ghut that runs diagonally across the site. Both of these sensitive features are to be preserved with a landscape buffer to keep them in their natural state. Fencing keeps unwanted species of fauna from entering the site.

SPECIES COMPOSITION:
As the site is developed, it will be crucial to preserve species diversity on site – areas disturbed by construction will be minimized as much as possible and replanted with native material that matches existing species.

COMMUNITY STRUCTURE:
Since this site is currently in the process of landscape regrowth, there is an opportunity to positively guide succession through encouraging native species that support local fauna and create a complex spatial mosaic that connects to the larger system of the surrounding national park. The project serves as a template for prioritizing native species in the Virgin Islands, rather than commonly used species from other islands such as Guam, the Philippines, Borneo, and Java or regions such as Mexico, Australia, Brazil and Asia.

ECOSYSTEM FUNCTION:
Post-construction, the ghut should function to channel water and support a microhabitat of plants and animals. The natural process of succession should be supported by the plants added to the site and the influence of the surrounding forest. Older plants on site should be preserved as much as possible, while new plants are incorporated to support a broader range of species. The site stays ecologically connected to the national park and the surrounding areas. It is not a "controlled tract" within a larger system but part of that system.

EXTERNAL EXCHANGES:
This design should strengthen the links between the site and the surrounding national park and further create positive exchanges through the health of the ghut and the site's species diversity, while supporting wildlife and enhancing biodiversity.

02

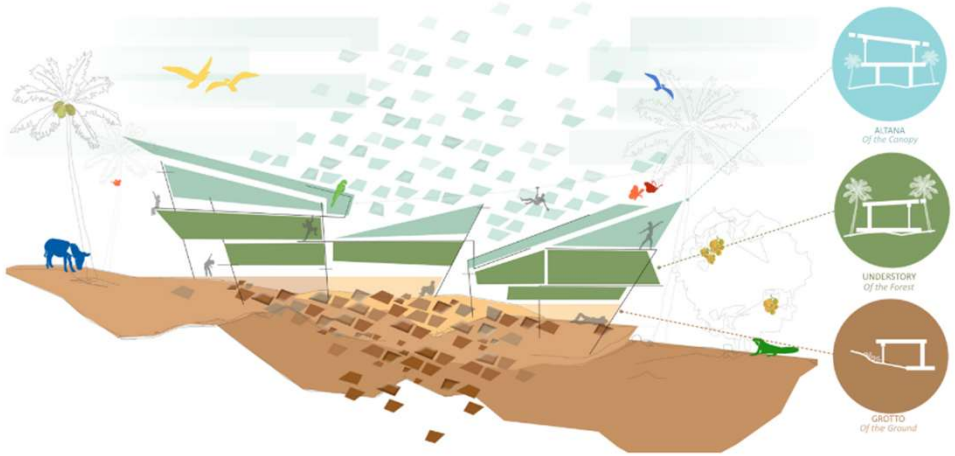
DESIGN CONCEPT

Touching Lightly on the Land







Discovering the Virgin Islands: The Altana

"Once you have tasted the taste of sky, you will forever look up."

-Leonardo da Vinci, Italian artist

Top of the Canopy! The upper floors of each building will have the strongest connection to the outdoors, creating a light and airy sense of space. This experience will be enhanced by natural breezes and elevated views to evoke a sensation of being in the treetops. Materials in these upper areas will be the most vivid, chosen to feel light and breezy as if you are standing at the horizon of the treetops and the sky!

Discovering the Virgin Islands: The Understory

"Sunlight seeped through the thickly-bunched leaves of the towering [...] trees, the clearing beneath them riddled with chaotic patches of brilliant light and gray shadow."

-Mickey Zucker Reichert, American author

Of the Forest. These spaces will balance outward connection with internal moments of seclusion, serving as a transitional zone. They are designed to include some sense of mystery and movement, like walking through a forest canopy or zip-lining(!) The color palette will gradually lighten, creating the feeling of approaching the leaves and seeing more daylight filter into each space.

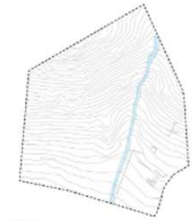
Discovering the Virgin Islands: The Grotto

"The frame of the cave leads to the frame of the man."

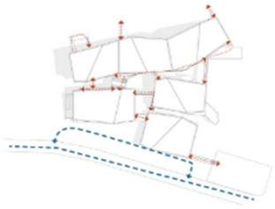
-Stephen Gardiner, English bishop & politician

Of the earth. These spaces will offer selective connections to the exterior, with a stronger emphasis on inward focus. These spaces will feel cooler in temperature through the use of deeper, earthier colors inspired by the ground, while still incorporating pops of color drawn from minerals and rocks found from within.

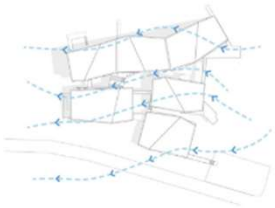
Project Overview



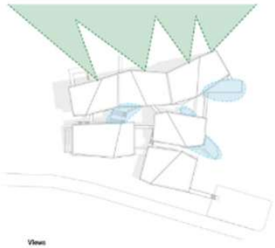
Existing Site



Proposed Circulation

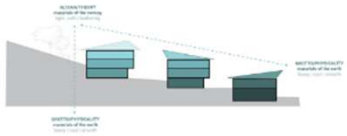


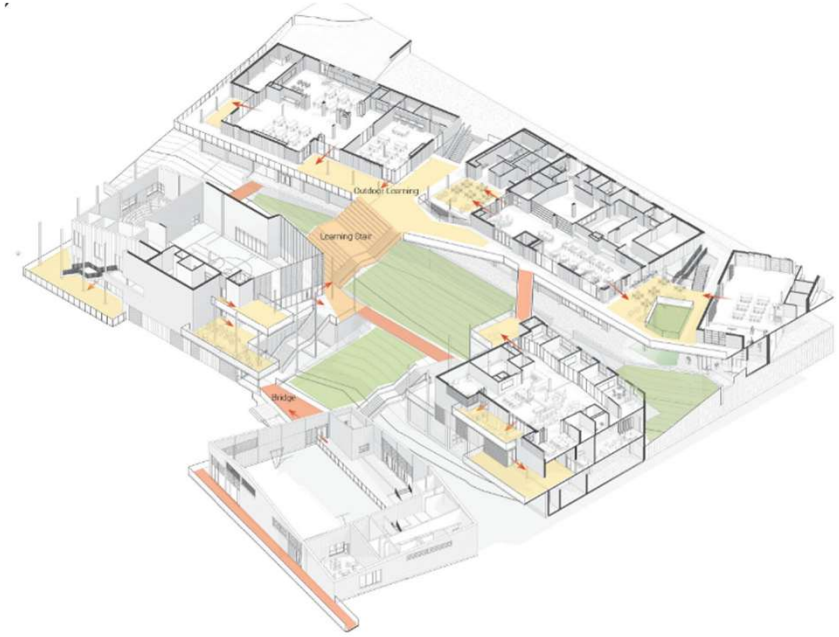
Winds

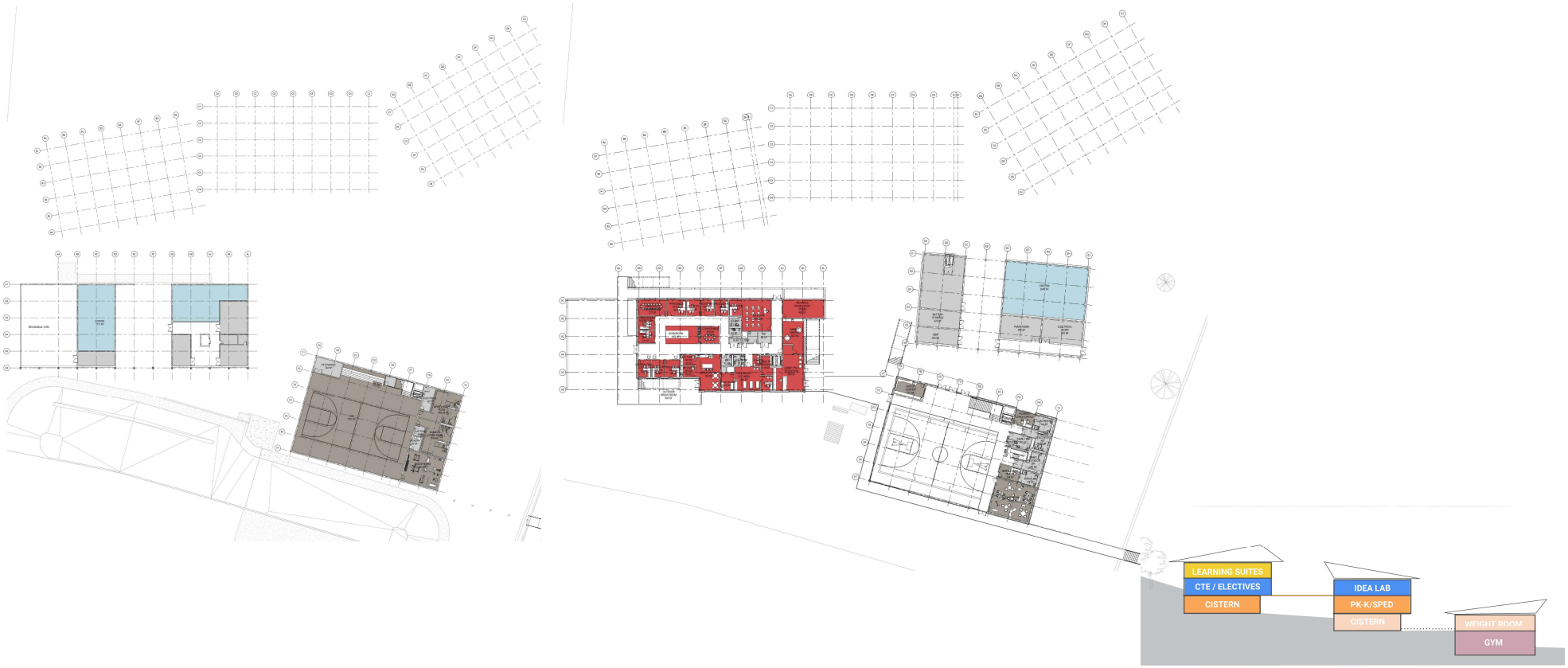


Views

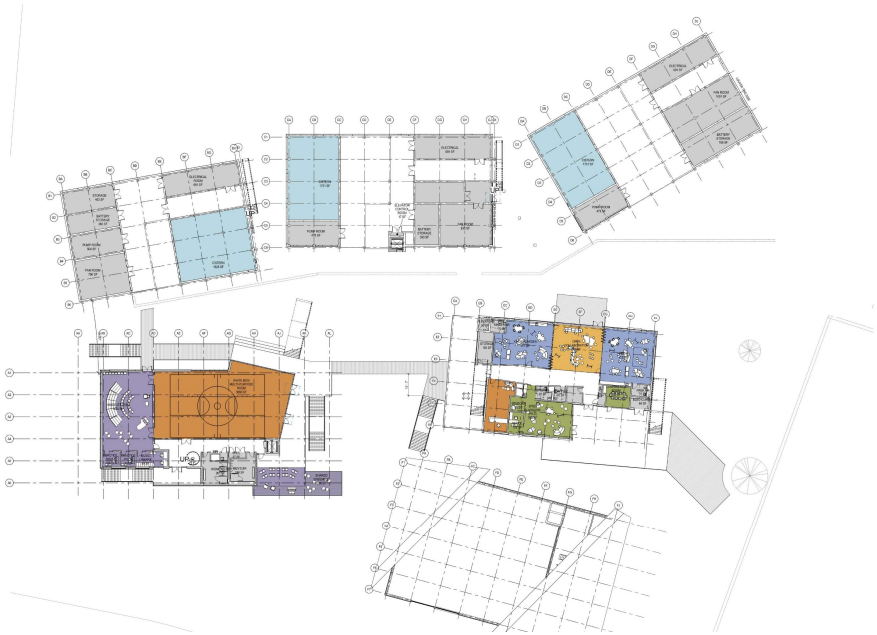
CONCEPT

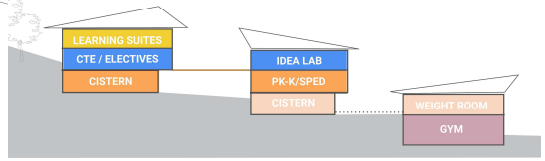






Grotto/Understory





Grotto/Understory

Ⓐ- Lappset Fairy's Waterfall

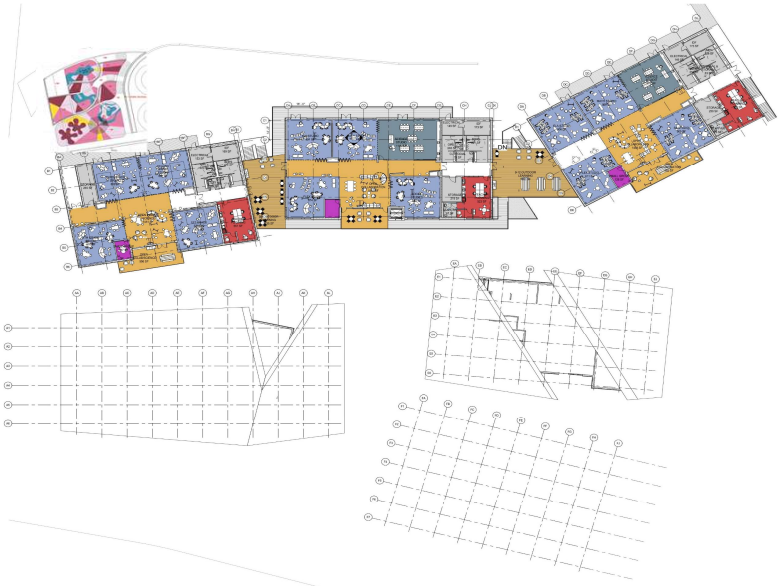
Ⓑ- Covered Tube Slide

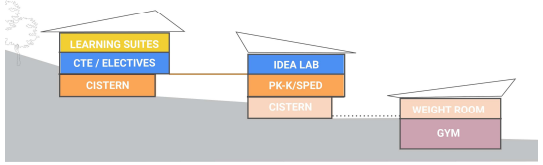
Ⓒ- Lappset Fairy's Circus

Ⓓ- Lappset Fairy's Carousel

Playground surfacing color concept image

Outdoor play



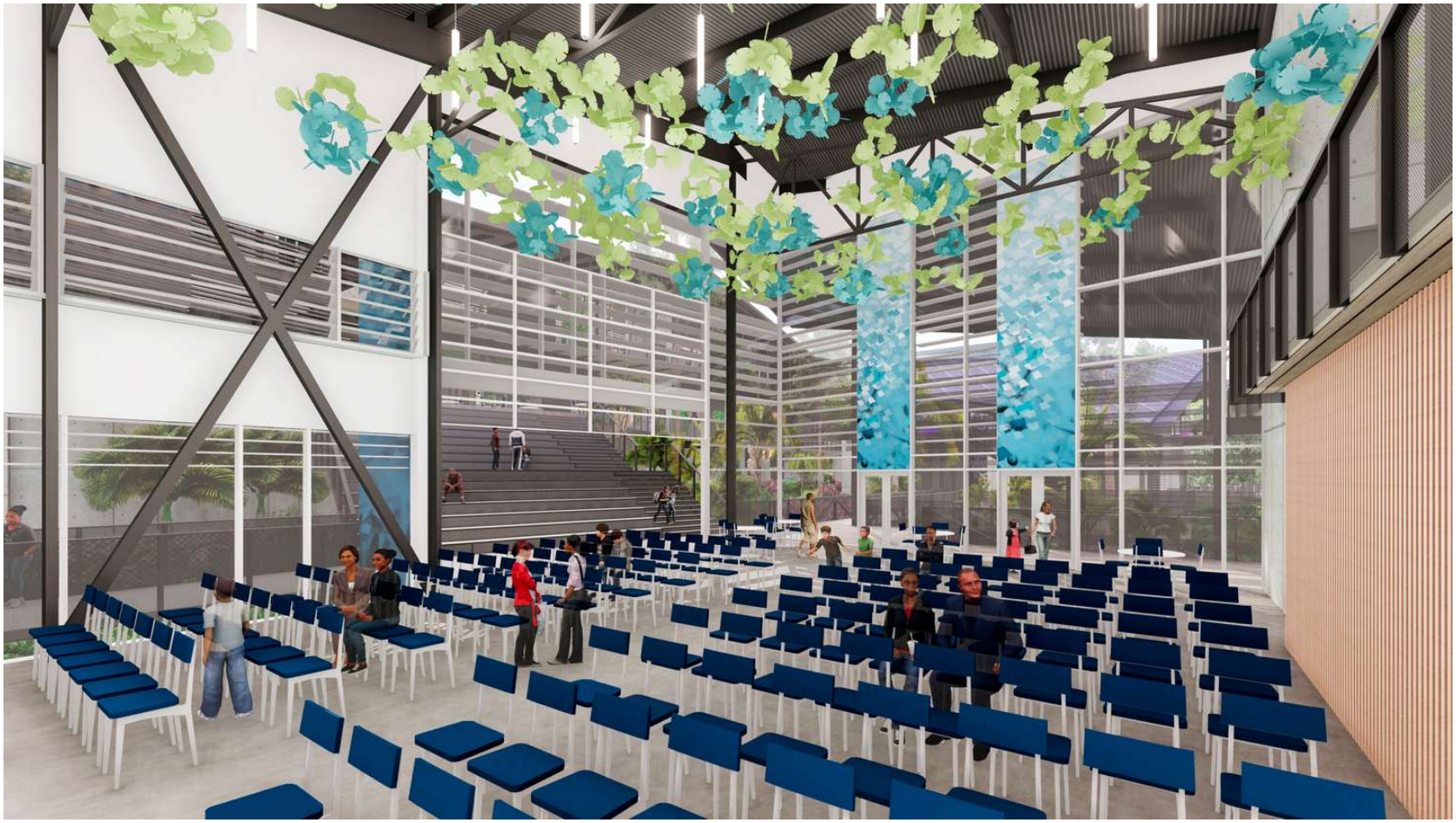


Altana/Canopy

03

INTERIORS

Mold Resistant + Durable



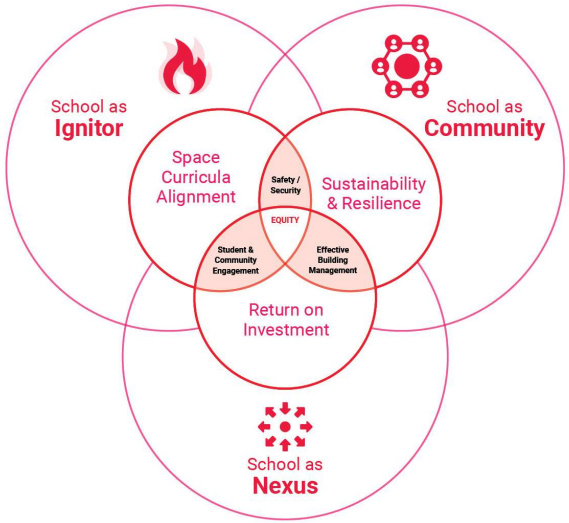
Insert updated flythrough

04

CONNECTIONS
Culture and Context

Leveraging a Dynamic Interplay

- **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 + Guiding Principles

Maker learning isn't just a subject or a space in a school; it is a hands-on, design-centered way of engaging learners that can enhance learning in both formal and informal environments. Maker Learning embodies Powerful Learning that is:

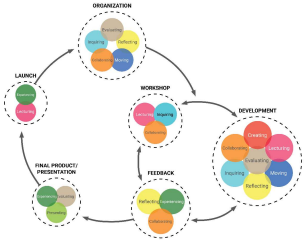
Personal and Accessible: Learners own the process as they work to build meaningful physical and digital products. By tapping learners' interests and talents, engagement and accessibility increase investment in the learning process.

Authentic and Challenging: Maker learning is rooted in real and relevant skills, concepts, and issues. Learners are challenged in core content, maker modalities, and their combined impact on the real world.

Collaborative and Connected: Learners work together to harness the skills and knowledge of their peers and the local and global community. These connections create opportunities for learners to make meaningful change alongside those who share their passions

Inquisitive and Reflective: Maker learning is a hands-on way to answer questions and find new questions to ask. It is an iterative process with a continuous feedback and development loop, allowing for reflection on process, product, and impact.

U.S. VIRGIN ISLANDS
st.CROIX st.JOHN st.THOMAS



05

LIFELONG LEARNING

That is Immersive

ASPIRATIONAL GOALS

GOAL 1

Increase locally sourced food from 3% to **35%** of total food demand. Agriculture-related industrial production will increase from 2% of GDP to represent **5%** of GDP.

GOAL 2

The U.S. Virgin Islands will become a Blue Economy **research center of excellence** in the world for ocean-based tropical environments.

GOAL 3

Healthcare and health sciences will increase from 7% of GDP to **15%** of the U.S. Virgin Island's overall GDP.

GOAL 4

Entrepreneurs will have access to support and capital to scale their businesses and the **annual net change** in establishments will increase from 14 (2019) to **50 establishments**.

GOAL 5

Population in the U.S. Virgin Islands will increase **10%** from the official 2020 U.S. Census.

GOAL 6

Renewable sources of energy will represent **75%** of total energy consumption, up from the 1% that they represent currently.

GOAL 7

The U.S. Virgin Islands will have the **highest quality education system** in the Caribbean and the UVI will attract and retain the highest caliber science and technology talent.

GOAL 8

Extended stay visits, authentic experiences, and cultural offerings will increase from 63% of tourism-related revenue to 75%.

CURATING CURRICULUM

USVI History/Archeology/Conservation [25 Careers in Ecotourism (With Salaries and Primary Duties) | Indeed.com]

-Conservation/Stewardship/NPS
-Ecotourism

Are physical simulations as powerful learning tools as virtual simulations?

Can AI help enhance global connections?

Can AI assist in micro-credentialling?

Or is it policies around the talent pipeline and the economy?

CURATING CURRICULUM

Agribusiness/Maritime/Biology Lab [12 Careers in Agriculture To Explore (With Salaries) | Indeed.com]

- -Farm to Table
- -Hydroponics
- -Fishing

The Business of Maritime Computer Lab (CAD) [50 Marine Careers Essential Guide]

- -Ship Building/Boat Management
- -Maritime Environment + Conservation

Carpentry/Construction [15 Careers in Construction (With Salaries and Duties) | Indeed.com]

- -Boat Building
- -Cabinetmaking/Fine woodworking
- -Construction

CURATING CURRICULUM

Arts/Graphic Design/IT 11 Types of Graphic Design Jobs To Explore | Indeed.com

- -Graphic Design
- -Videos/podcasting
- -Gaming/3D Animation Computer Lab
- -Theater Productions

How are arts, sports, science, computational thinking and CTE all connected?

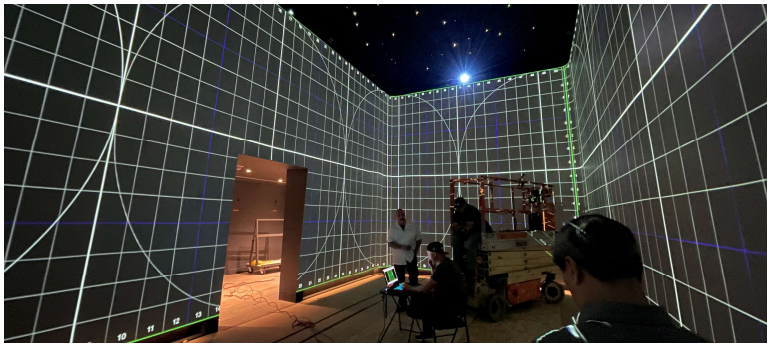
How will we explore the dynamic interplay between neuroscience, the science of learning, and innovative school design, forging a path toward holistic education?

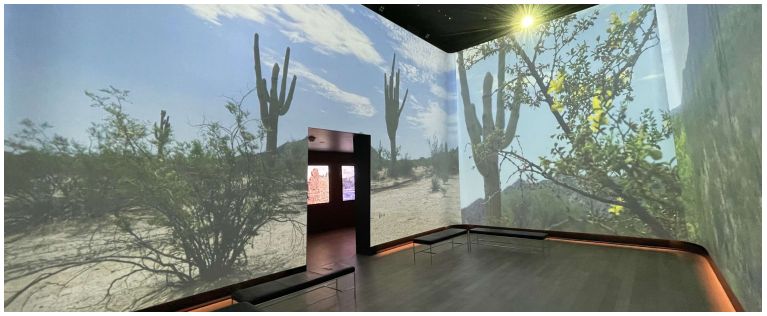
Is there a continuum of learning that connects core academics with maker thinking, computational thinking(CT) and artificial intelligence (AI)?

How does culture and context shape those connections?

Will that reshape learning environments to better enable?

How does policy on academic credits apply?





If CTE represents "applied learning", can it help provide the why of understanding and creation to shape how AI is utilized?

What are key attributes of Artificial Intelligence (AI)?

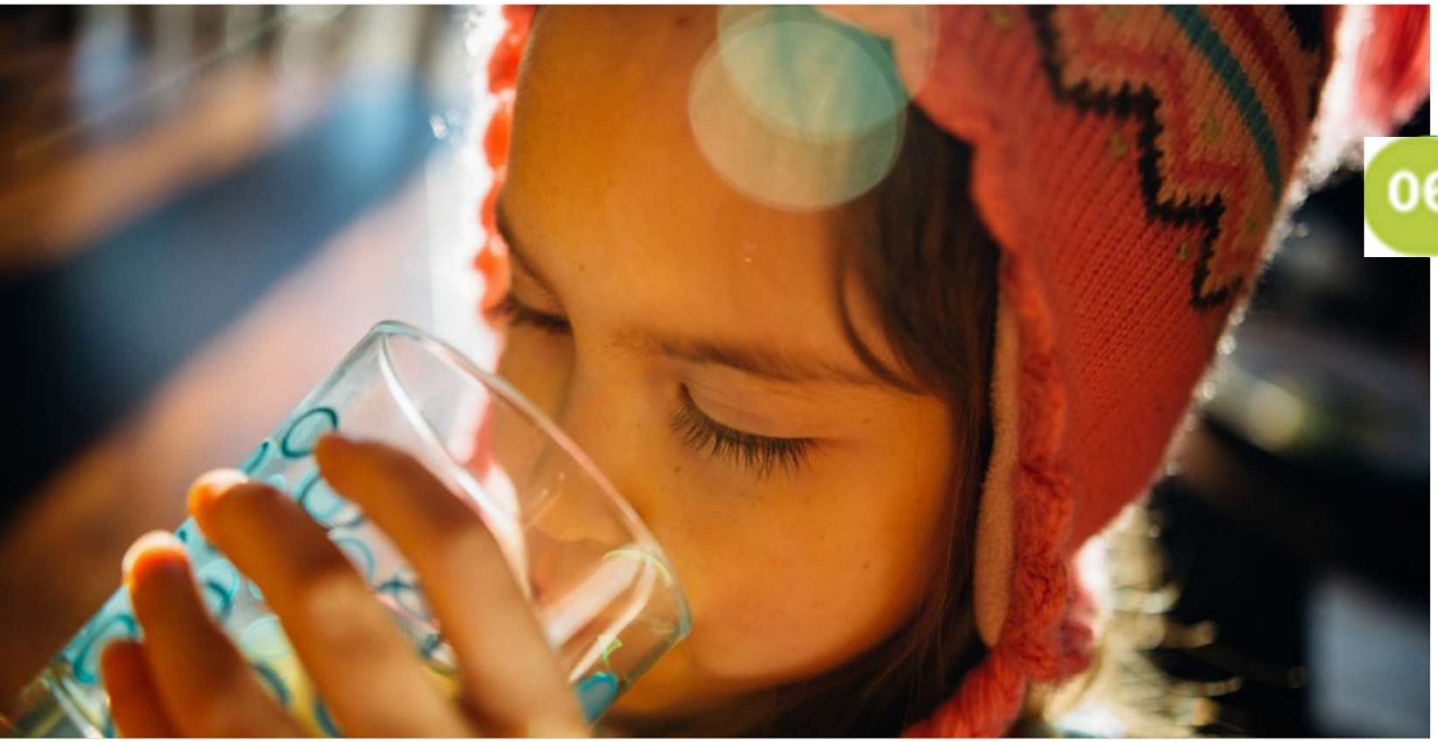
Does AI encourage collaborative thinking versus individual knowledge capture?

Does AI focus primarily on "big data" versus the "why"?

Can architecture enable the successful use of AI?

Or can it offset the individual "processing" of AI with hands on learning?

Is architecture at the intersection of process and engagement?



06

WATER

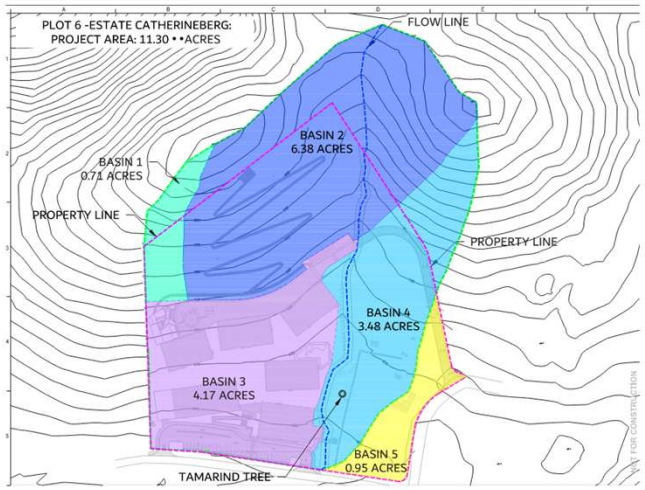
A Hydrological Balance

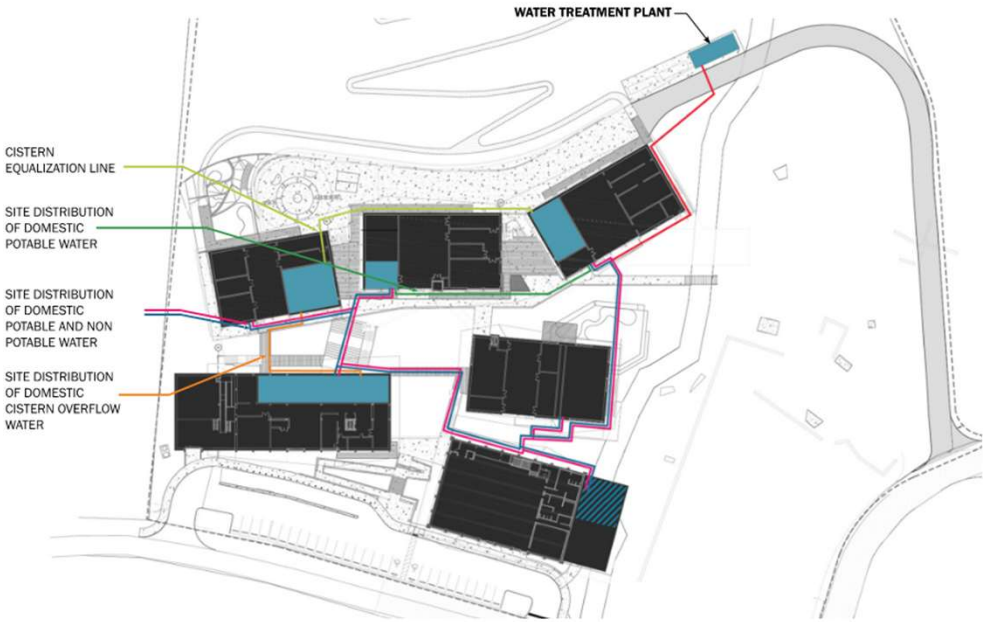
LESSONS LEARNED: Domestic Water

- Evaporation needs to be taken into account for cistern water and can be estimated using the formula shown in the design guide.
- Cisterns at higher elevations can be used to supplement the fire protection cistern in order to increase the total fire water available year round.
- FEMA Shelters require their own break tanks to hold potable and non potable water with their own building pumps in order to allow plumbing fixture usage during emergency events

LESSONS LEARNED: Fire Sprinklers

- Evaporation needs to be taken into account for cistern water and can be estimated using the formula shown in the design guide.
- When adequate city water is not available, the International Fire Code allows the use of NFPA 1142 to reduce the total fire water required to be held in storage.
- Cisterns at higher elevations can be used to supplement the fire protection cistern in order to increase the total fire water available year round.
- If site hydrants are fed by the campus fire pump, a FDC on the building is no longer needed

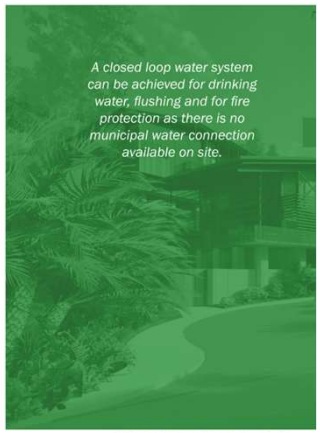


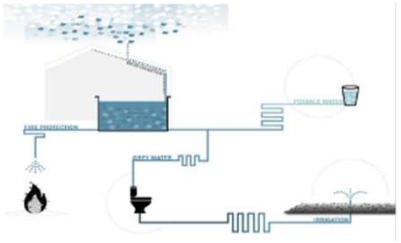


PROJECTED

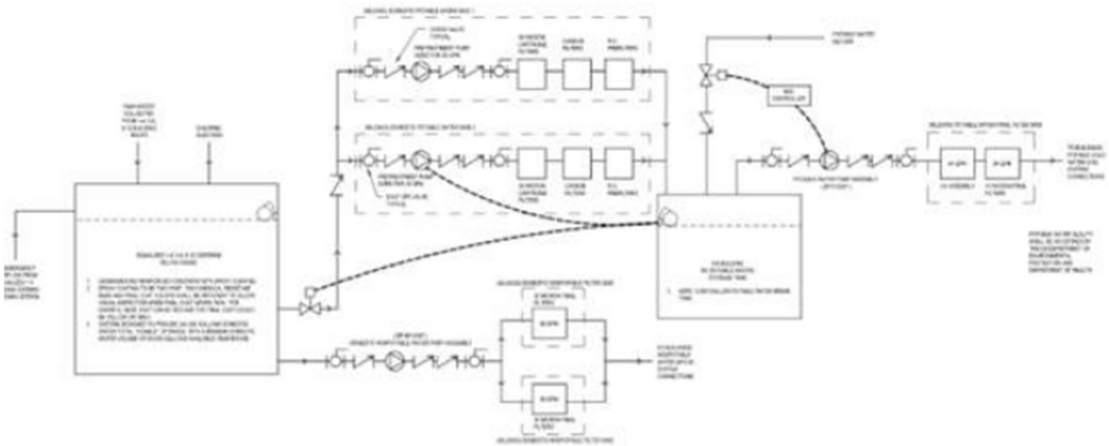
30%

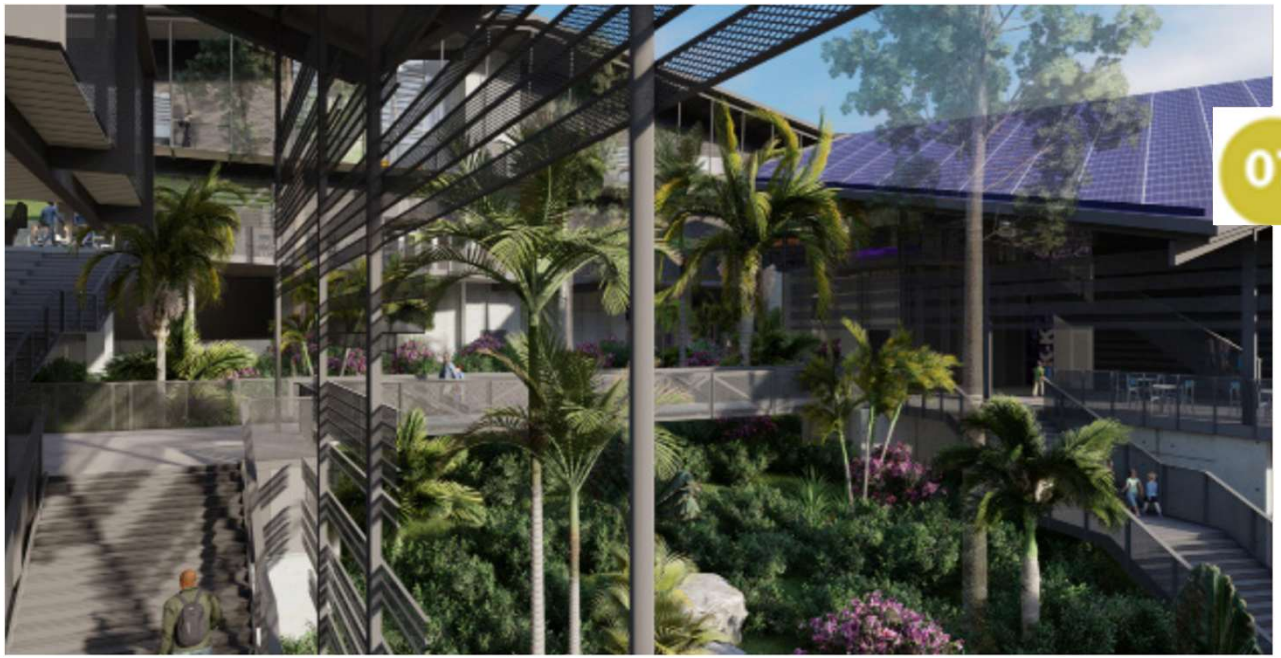
REDUCTION IN WATER USAGE





DOMESTIC WATER SYSTEM DIAGRAM





07

ENERGY

Alternate Sources

LESSONS LEARNED: Microgrid

The microgrid design shall include provision to incorporate future signals from WAPA for Demand Response and Export Limitations. WAPA is in the early stages of developing a demand response program, which would send signals to program participants to reduce demand in exchange for a financial benefit. The details are not yet known. For these VIDE sites, the demand reduction would occur by way of battery discharge.

In addition, WAPA is becoming concerned about periods of excess solar penetration. They may implement signal based export limitations where WAPA would send signals that would reduce the export limit (potentially to zero) during peak solar hours and light load (likely occurring on weekends). Similar to the demand response program, the details are not yet published.

As of now, the microgrid design shall plan for the following:

Provisions for future Remote Terminal Unit furnished by WAPA. This is assumed to be an enclosed 19" rack which will require a 20A, 120V circuit. When installed, it will need a pathway to the microgrid controller to send the appropriate signals. Space for the rack in the electrical room shall be provided. A pathway to the roof should be considered for potential connection to antenna for signal receiving. The connectivity is not yet known, but it is common for signals to be sent via radio.
Provisions within the microgrid controller to receive the future signals. It is not known whether these signals will require contact closures or be sent via another protocol (RS-485 or ethernet). Considerations shall be made with the microgrid controller to receive these signals.

Resilient and Efficient: Net Zero Energy - PV's + Microgrid (

Normal mode – Excess PV/BESS

The microgrid is connected to the utility grid and operates in parallel. During times where the PV generation exceeds the loads (such as midday), PV energy will power the loads, recharge the BESS (if needed), and the excess will be sent back to the grid. Credits at the net metering rate will be applied to the utility bill.

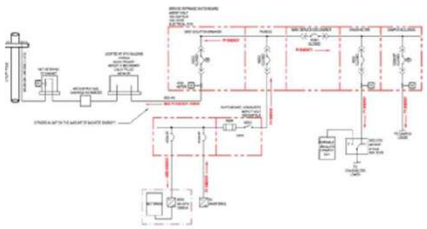


Figure 6: Normal operation with excess PV/BESS energy

Normal mode – insufficient/No PV and BESS discharge

In normal operation, the microgrid is connected to the utility grid and operates in parallel. At certain times (such as early mornings or late evenings) there may not be enough energy from the PV and the BESS will discharge to power the campus. If the BESS is still insufficient, some grid power may be used in addition to the BESS power. Figure 7 shows this mode.

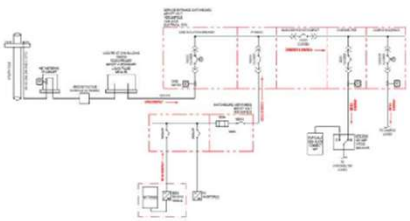


Figure 7: Normal operation with insufficient PV/BESS energy

Island mode – Short Term grid outage

During a short-term grid outage, the microgrid will disconnect from the utility grid by opening the grid isolation breaker and operate autonomously. The PV and BESS will power the loads. In the case of excess PV energy and a fully charged BESS, the microgrid system will curtail the PV production to maintain energy balance. Figure 8 shows this mode.

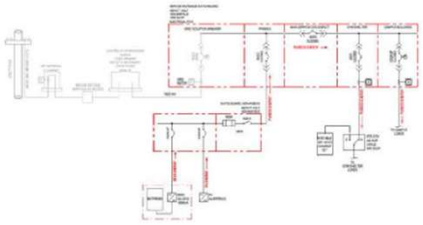


Figure 8: Island mode: Short term outage

Island mode – Shelter mode

During shelter mode, the microgrid will disconnect from the utility grid by opening the grid isolation breaker and operate autonomously. In addition it will shed the non-critical campus loads by opening the campus load breaker. The PV and BESS will power the loads. In the case of excess PV energy and a fully charged BESS, the microgrid system will curtail the PV production to maintain energy balance. Figure 8 shows this mode.

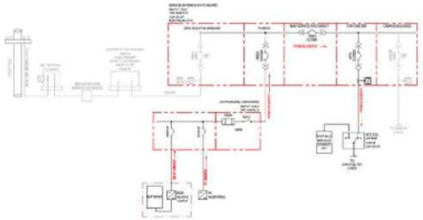
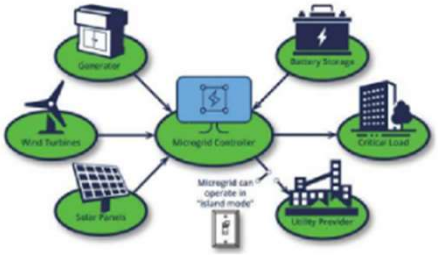
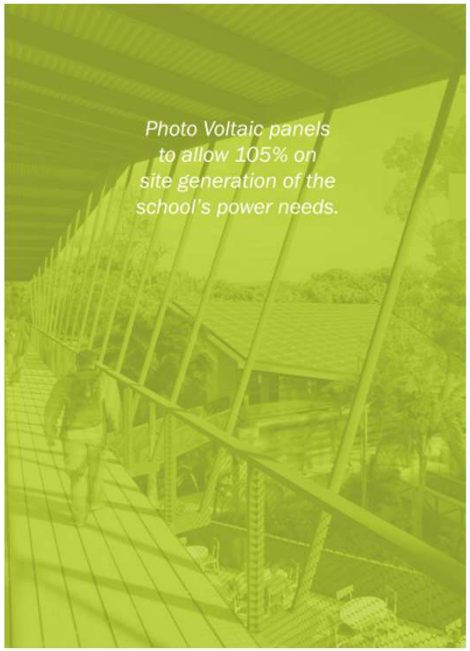


Figure 9: Island mode: Shelter mode





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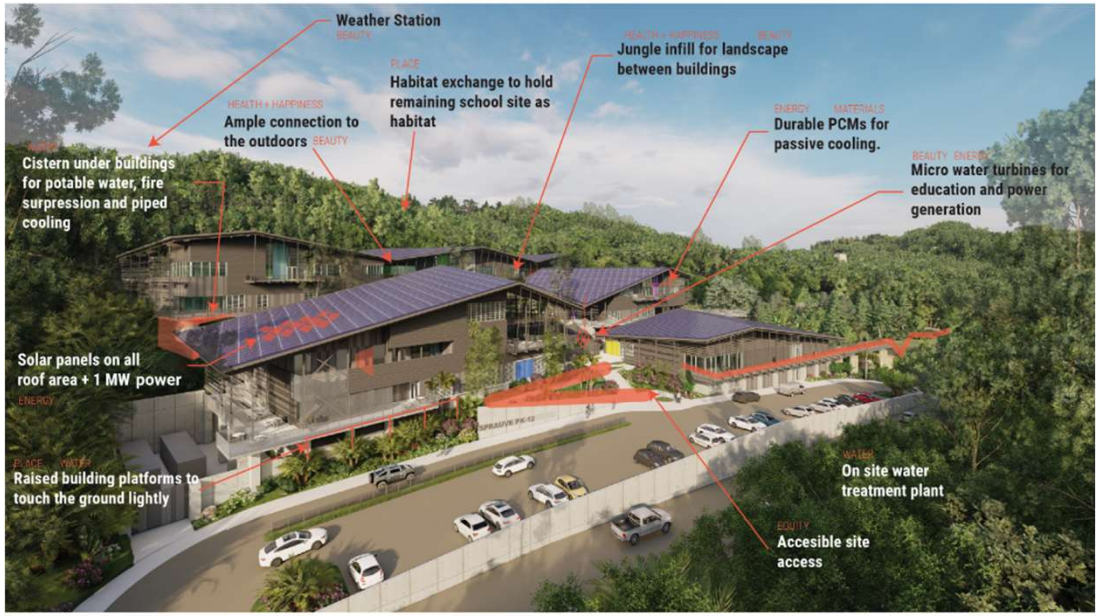
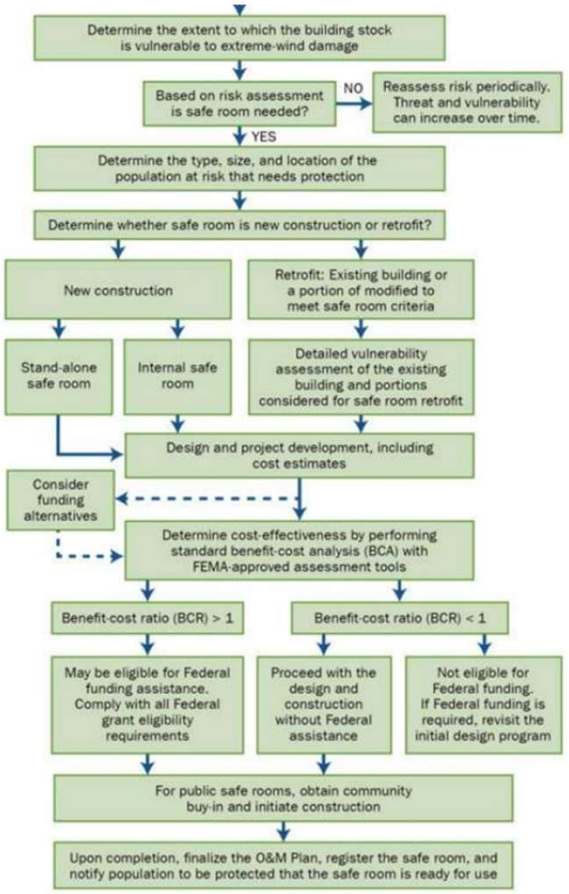
RESILIENCE

To Emergencies



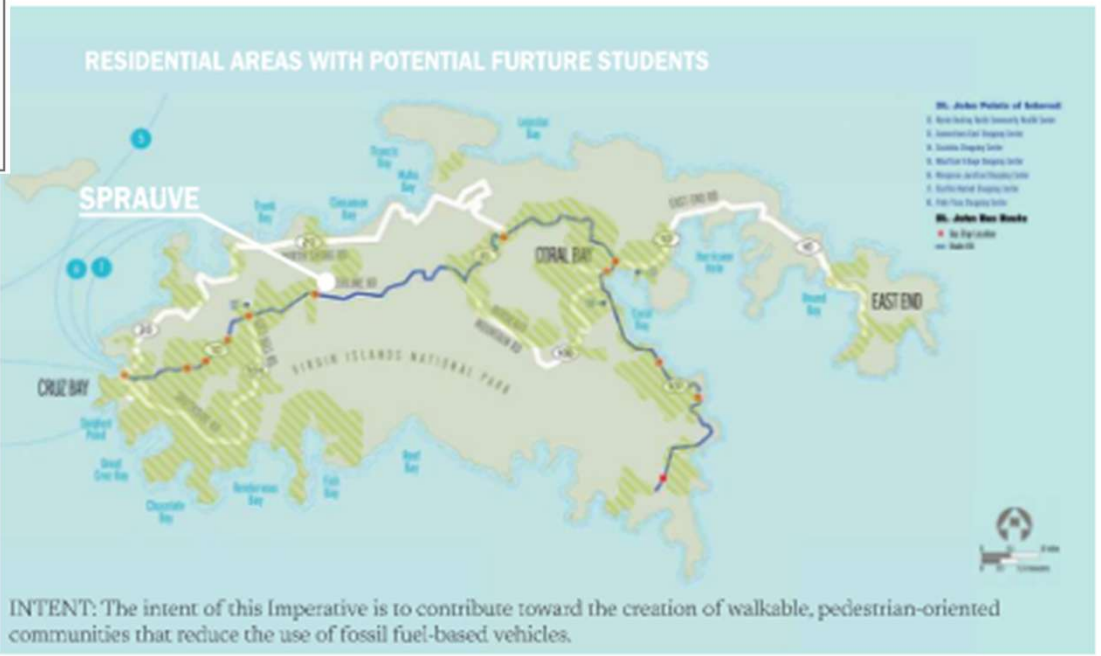


EQUITY + INCLUSION

Access for All: Physically and Technologically

Access for All: Physically and Technologically

SPRAUVE PREK - 12 SCHOOL



INTENT: The intent of this Imperative is to contribute toward the creation of walkable, pedestrian-oriented communities that reduce the use of fossil fuel-based vehicles.

We explore the dynamic interplay between neuroscience, the science of learning, and innovative school design, forging a path toward holistic education. Drawing from the latest research, we uncover how the brain learns and adapts, illuminating strategies to optimize learning experiences for all students. From fostering neural plasticity to embracing neurodiversity, we unveil the keys to unlocking each student's full potential."

-Jean-Claude Brizard

Where is the nexus of inquiry-based learning, maker learning, CTE, computational intelligence and artificial intelligence (AI)?

What is Computational Intelligence? – IEEE Computational Intelligence Society

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

THE VIRGIN ISLANDS DEPARTMENT OF EDUCATION