



**LITTLE**<sup>®</sup>  
DIVERSIFIED ARCHITECTURAL CONSULTING

## **EVOLVING A COMMUNITY THROUGH EDUCATION DESIGN**

Creating a school at the center of an underserved neighborhood, supporting universal access, and inspiring young students to become future leaders



**SEAN TRACY**

AIA, ALEP, CPTED

Studio Principal



**JOELLE VAILLE**

WELL AP

Interior Designer



**PETE HALL**

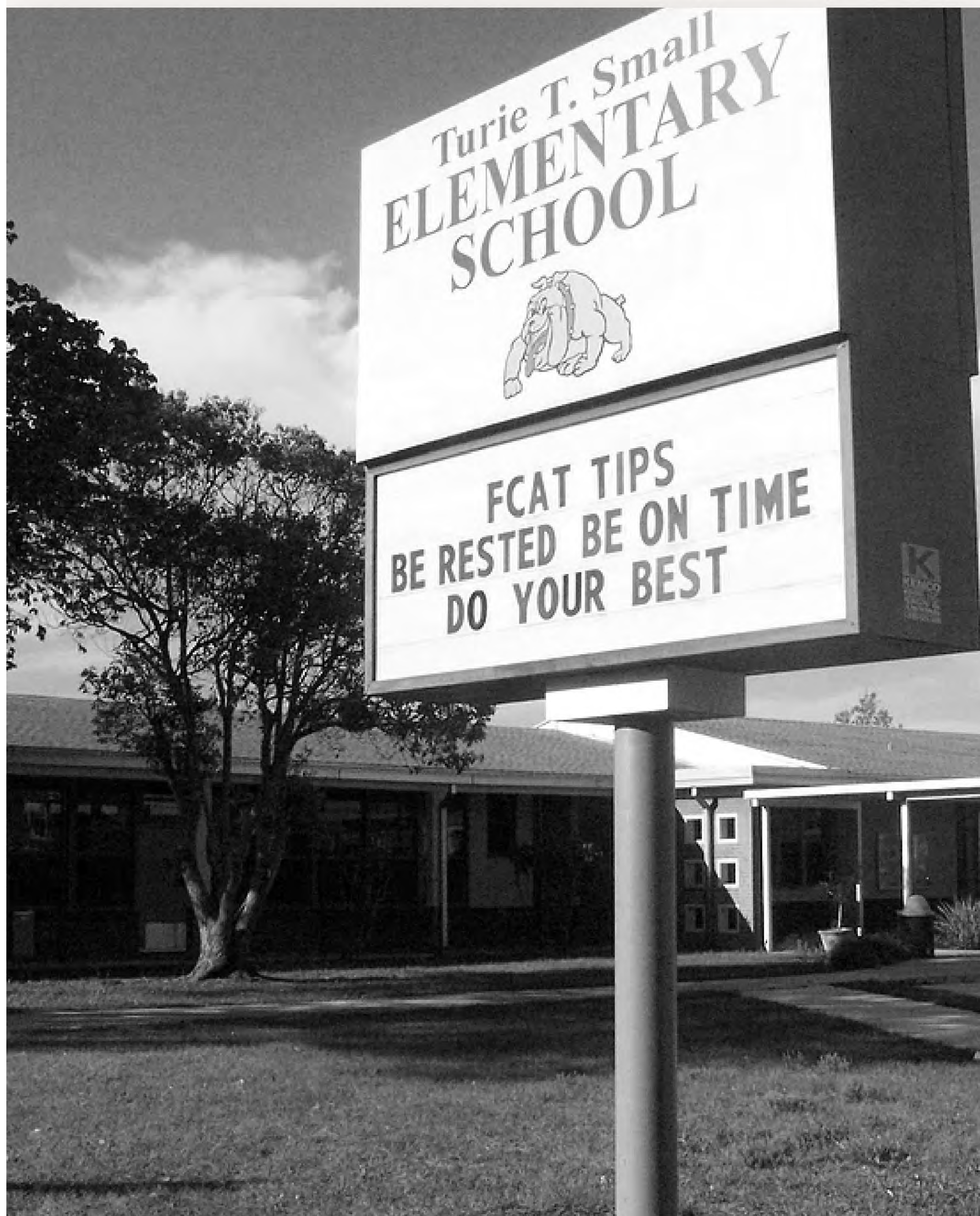
AIA, WELL AP

Sr. Design Architect

# LEARNING OBJECTIVES

---

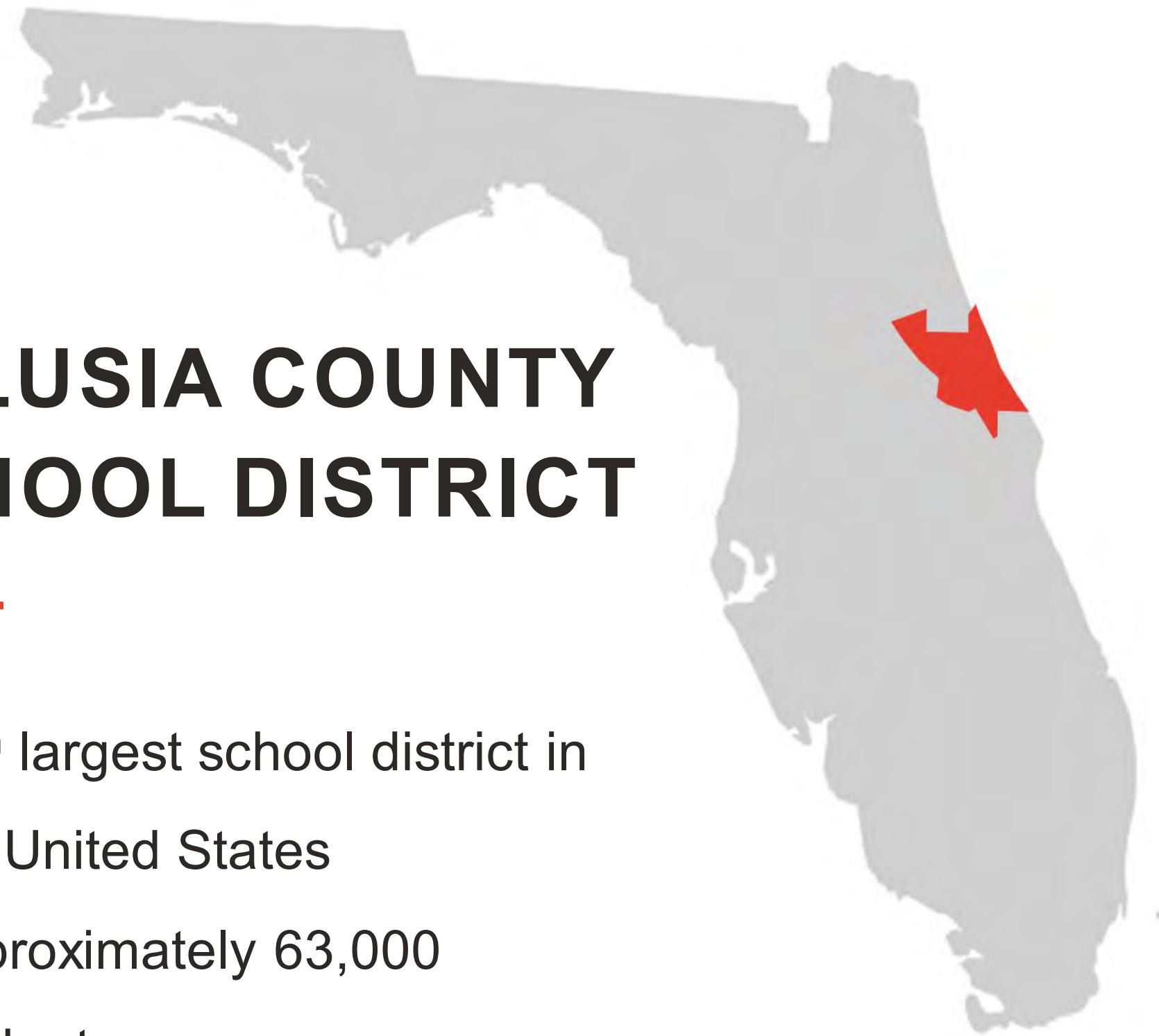
- Understand design strategies and benefits of creating an education facility that serves a greater community and enables equitable access to education.
- Learn design strategies for effectively creating and maintaining a safe and secure learning environment in a disadvantaged neighborhood.
- Understand how to involve the community and all key stakeholders to make a widespread impact through design, addressing community needs (medical, social, etc.)
- Understand best practices for creating sustainable, flexible space that serves students and engages community members while increasing occupants' well-being.



## VOLUSIA COUNTY SCHOOL DISTRICT

---

- 57<sup>th</sup> largest school district in the United States
- Approximately 63,000 students
- 45 elementary schools
- 12 middle schools
- 9 high schools



# AFRICAN AMERICAN EDUCATION IN THE US

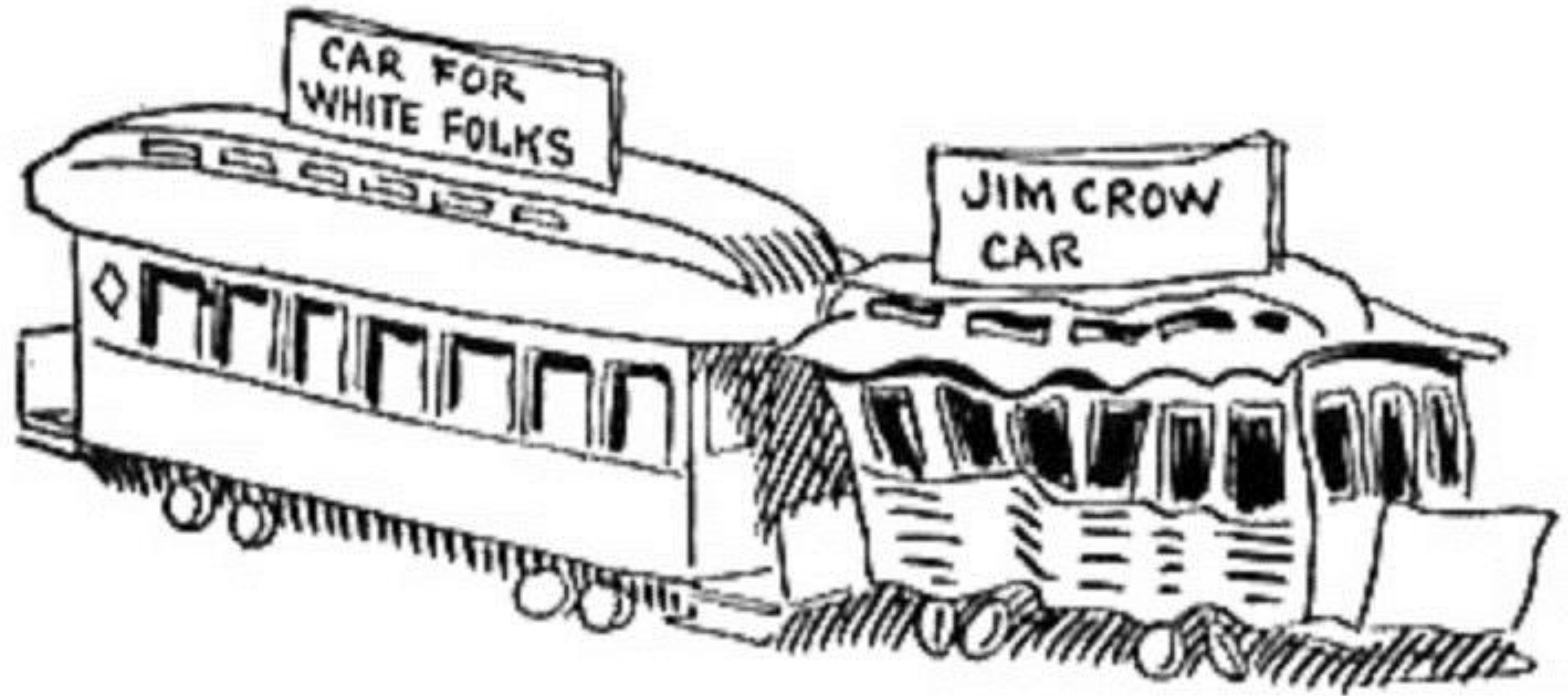
---



**FIRE IN FREEDMEN'S  
SCHOOLHOUSE, MEMPHIS, 1866**

# AFRICAN AMERICAN EDUCATION IN THE US

---



# AFRICAN AMERICAN EDUCATION IN THE US

---



# AFRICAN AMERICAN EDUCATION IN THE US

---





# AFRICAN AMERICAN EDUCATION IN THE US

---



# AFRICAN AMERICAN EDUCATION IN THE US

---





# AFRICAN AMERICAN EDUCATION IN THE US

---

# HISTORY OF TURIE T. SMALL ELEMENTARY



**1884**

Daytona Colored School: served all African American students in the Daytona Beach area with 200 primary school children.

**1954**

A new South Street School was built to address increased student population and renamed Turie T. Small Elementary in 1960. Turie T. Small is the oldest school facility in the Volusia County Schools district.

**1943**

Turie T. Small was named principal of the new South Street school.



**2023**

The 69-year-old school is being replaced

# PROJECT CONTEXT

**95%**

Economically  
disadvantaged  
students

**88%**

Minority  
Enrollment

**50%**

Students bused to  
surrounding  
schools

**94%**

Free or reduced  
lunch



Project site located in  
a significant flood zone area

# CHALLENGES TO CREATE A TRUE COMMUNITY SCHOOL

---

**Historically  
underserved  
community**

**Family issues  
impacting  
student  
achievement**

**Inadequate  
size for  
the student  
population**

**94% free  
and  
reduced  
lunch**

# COMMITMENT TO REGENERATIVE DESIGN

---

H



## HEALTH

We will design environments that elevate health and wellness.

E



## ENERGY

We will use a smart, responsible design approach to reduce the energy demand of our projects.

W



## WATER

We will design for the preservation and conservation of water.

S



## SOCIAL EQUITY

We will address universal design and social inequities through empathetic and intentional planning.

# VISIONING





“As we rebuild this school, we want to make sure we are capturing the vision of this community moving forward. you only get this opportunity every 50 years to rebirth a school - we want to make sure we get it right.”

-Volusia County Superintendent



# VISIONING SESSION

---

22 separate stakeholders attended including Volusia County Schools personnel, Turie T. Small staff and teachers, City of Daytona Beach staff, local higher education representatives, and surrounding community and church organizations.



# VISIONING EXERCISES

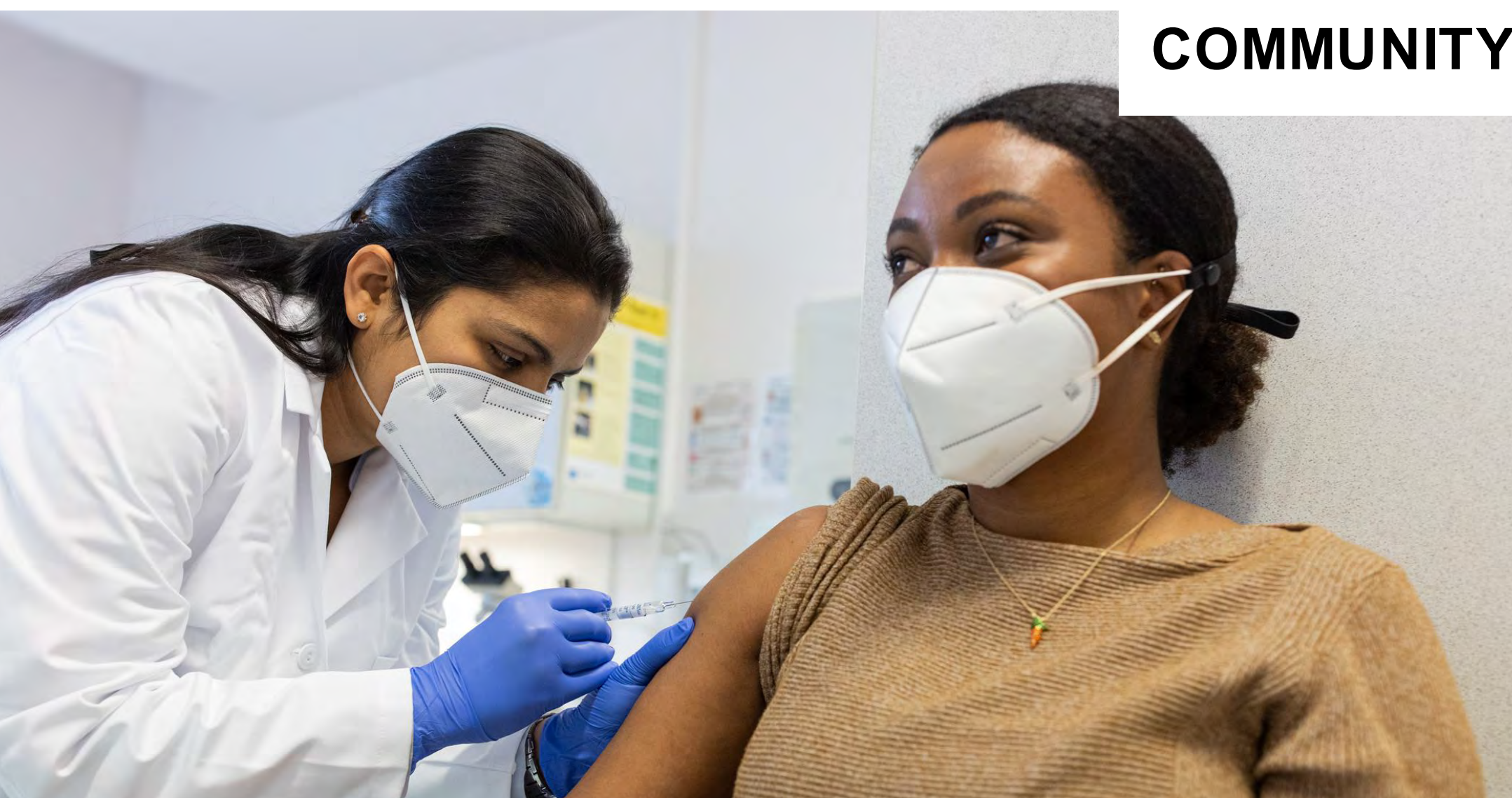
---





# **FINDINGS**

## **COMMUNITY DRIVEN NEEDS**





# FINDINGS

## EDUCATIONAL GOALS





# FINDINGS

---

## FACILITY GOALS



# DESIGN DRIVERS

---

Strong Connection  
to Community

A 21st Century  
Learning  
Environment

High Performance  
Design  
(EUI 25)

Student Health  
and Well Being

Welcoming  
and Inclusive  
Environment

Flexible and  
Adaptable

Colorful and  
Energetic  
Environment

# INTERNAL CHAMPION

---







# DESIGN

105,000 GSF  
859 Student Stations  
\$47.6 m

# YEARLY ENERGY COSTS

STATE OF FLORIDA | VOLUSIA COUNTY SCHOOLS



An aerial photograph of a modern, multi-story building with a flat roof covered in solar panels. The building is surrounded by a courtyard with greenery, palm trees, and a paved area. In the foreground, there is a curved solar tracking array with orange support structures. A white van is parked in a parking area near the tracking array. The text "Net-Zero Energy Ready" is overlaid in large white font across the top half of the image.


**Net-Zero Energy Ready**

**vs**

**Net-Zero Energy**

Any building  
can be zero-  
energy...



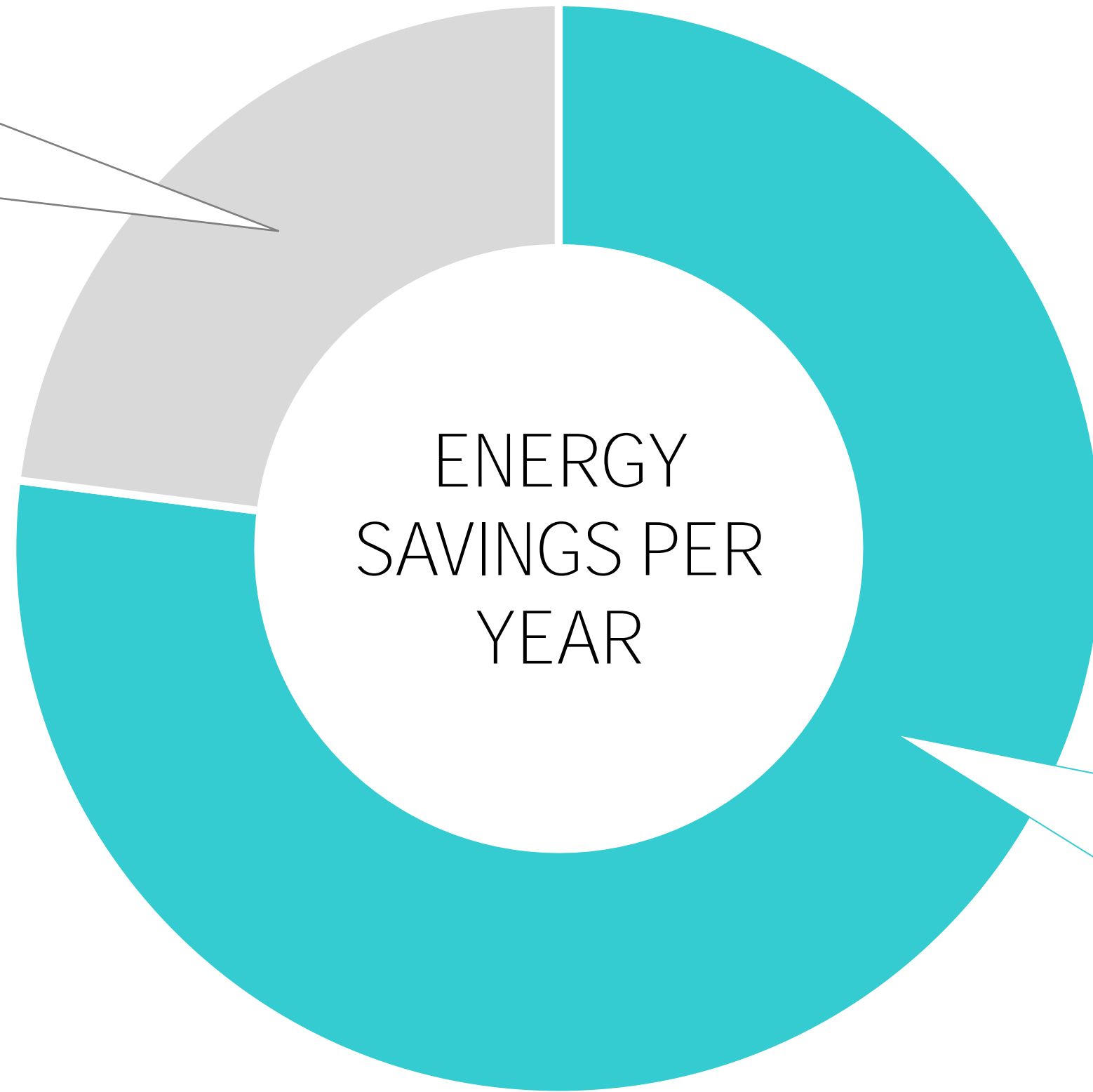
An aerial photograph of a vast solar farm. The solar panels are arranged in neat, parallel rows that stretch across a large area of land. The surrounding landscape includes green fields, a body of water, and some industrial buildings in the distance. A black circular graphic is overlaid on the left side of the image, containing white text.

If you have  
a solar array  
big enough

One rule remains constant for new construction and retrofits:

REDUCE DEMAND FIRST,  
SUPPLY SECOND

23%  
Solar Panel Production



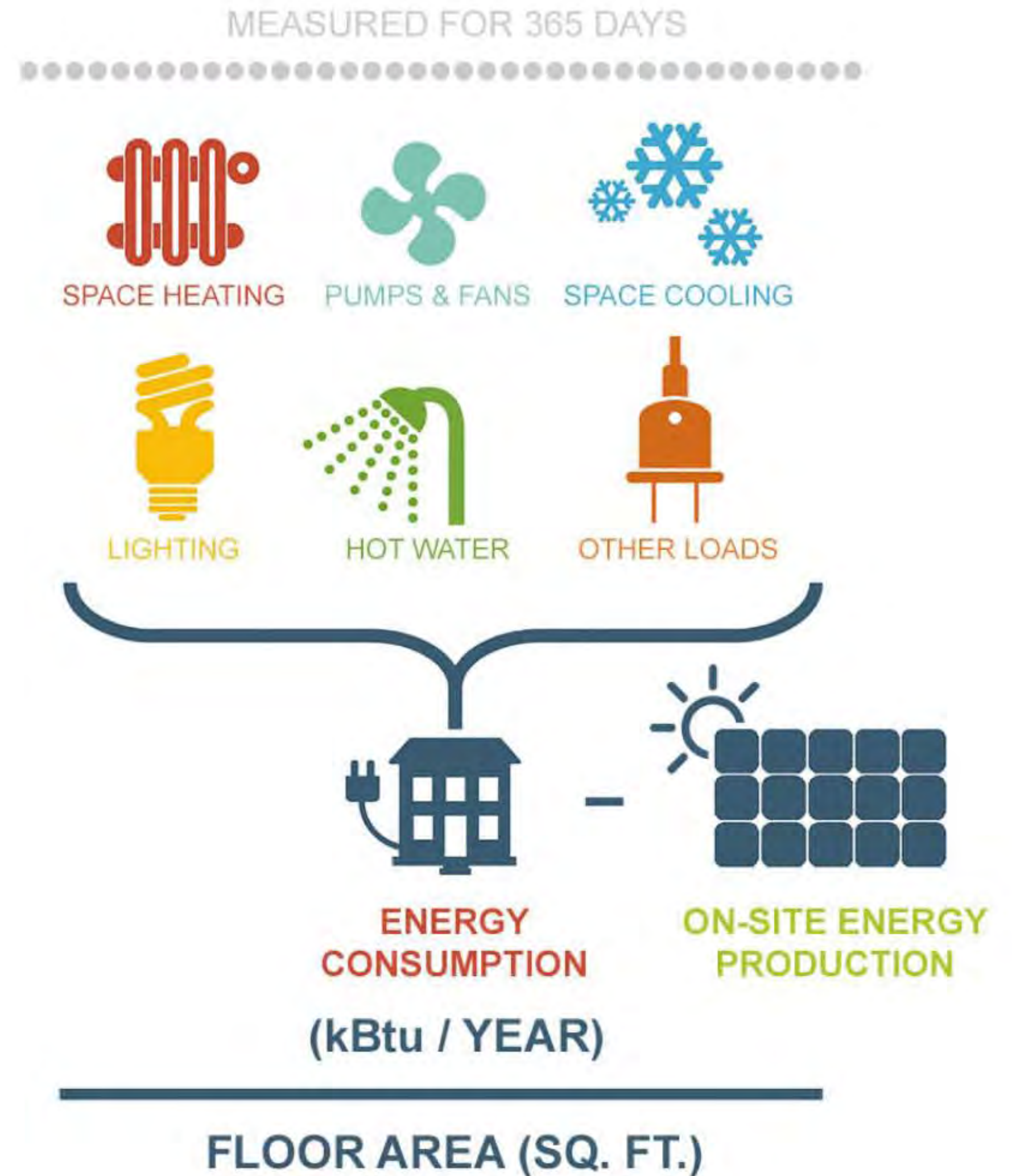
Approximately  $\frac{1}{4}$  of the savings are from solar panel production

77%  
High-performance Building Design

# WHAT IS EUI

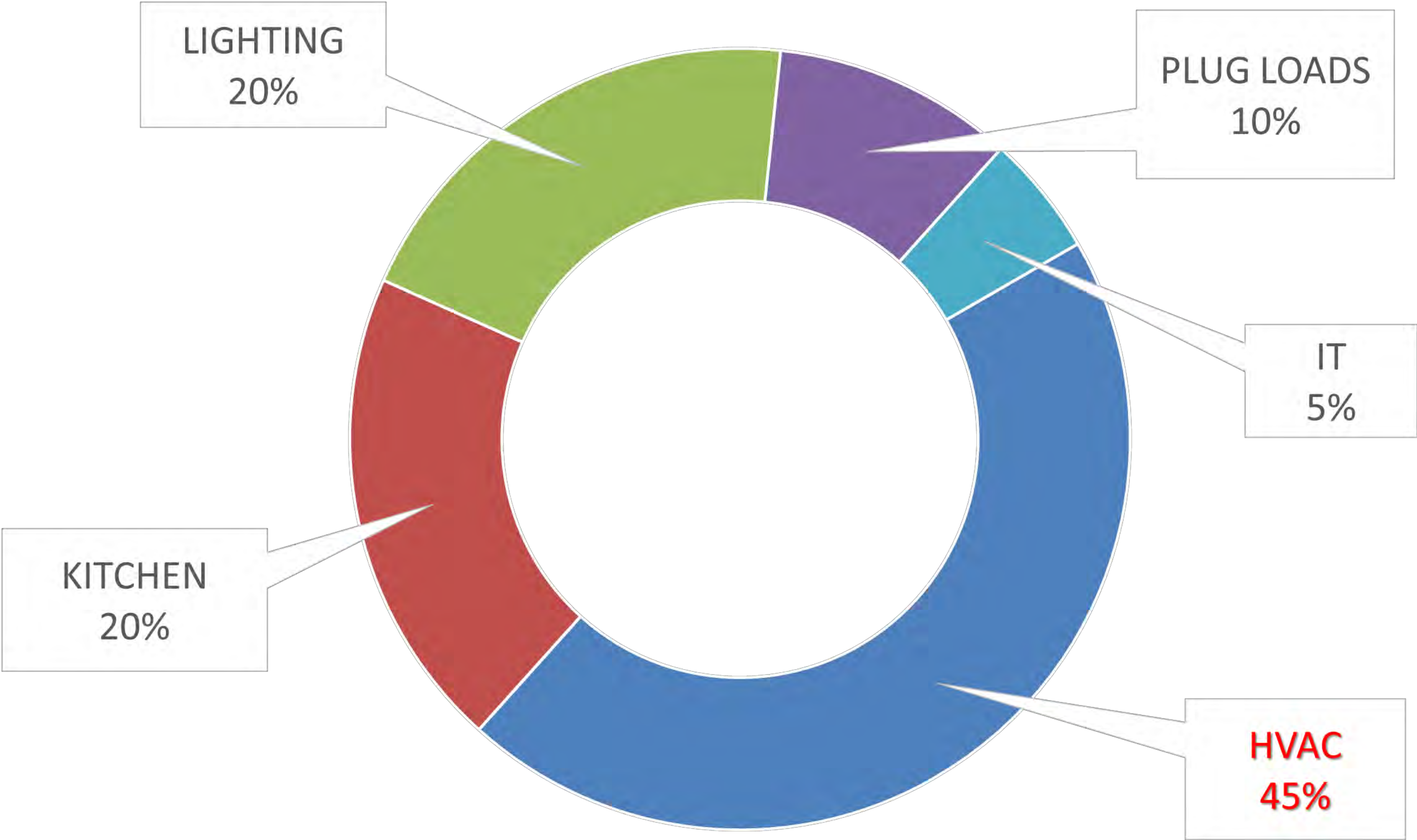
**Energy Use Intensity (EUI)**  
...the lower the number  
...the lower the energy use

A net-zero energy building returns as much energy to the power grid as it uses in a year



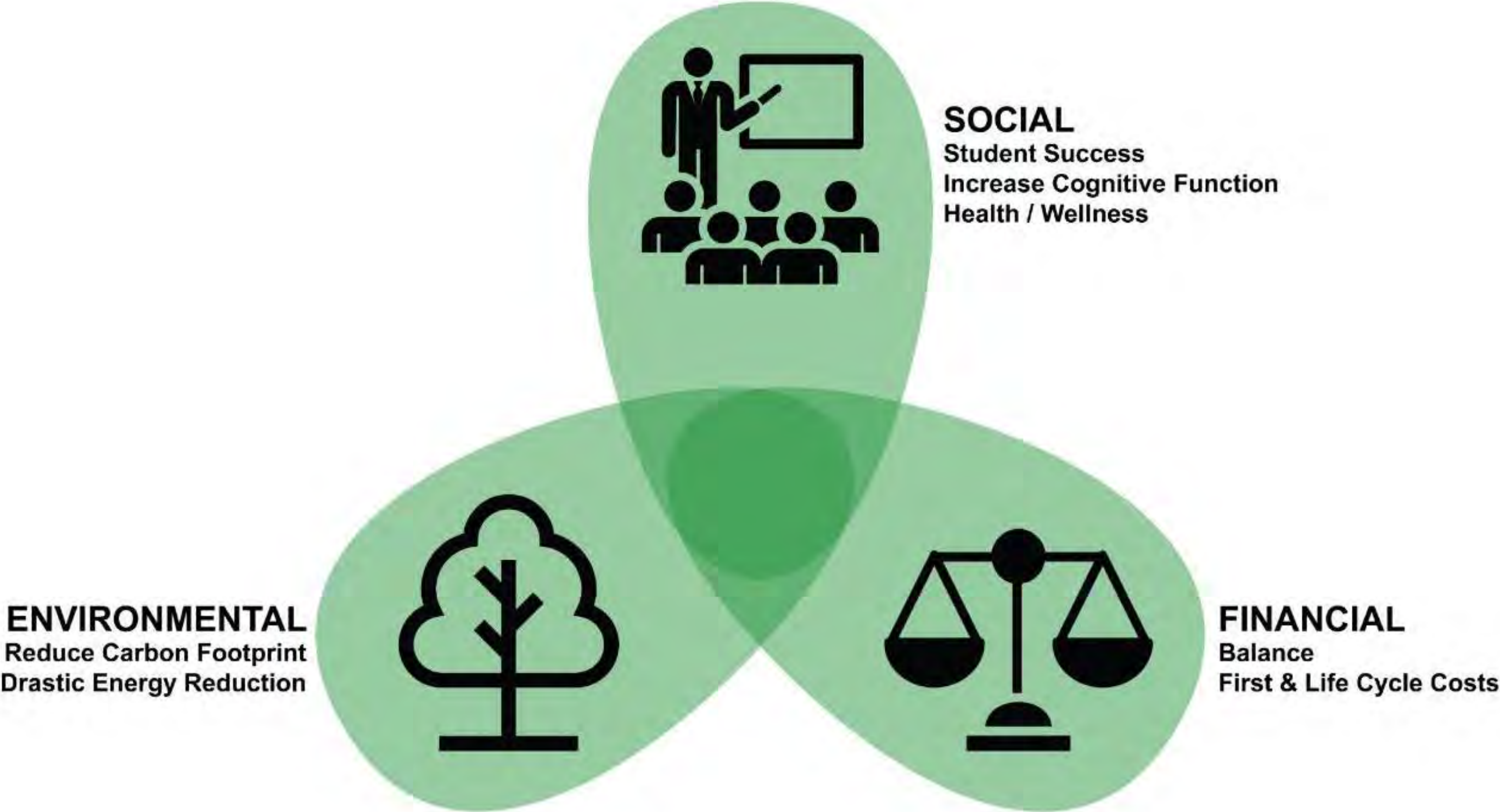


# FOLLOW THE ENERGY



# HIGH PERFORMANCE

---



ALLOW  
ME TO HAVE  
A FUTURE



MAKE HUMANITY  
GREAT AGAIN



SO



# HEALTH & WELLNESS

---

OVER 46% OF US  
PUBLIC SCHOOLS  
HAVE POOR  
INDOOR  
ENVIRONMENTAL  
QUALITY




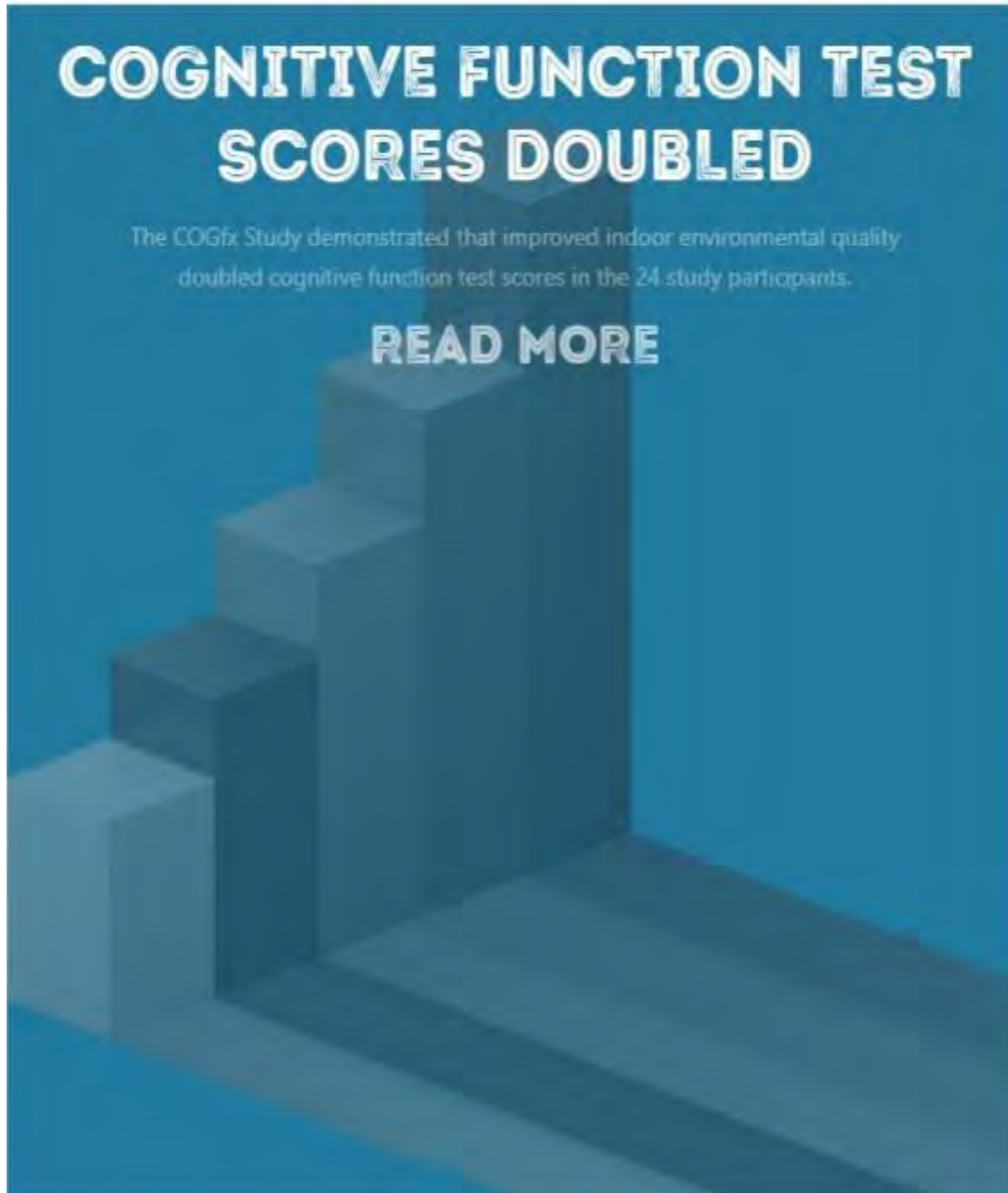
# HEALTH & WELLNESS

## BETTER AIR QUALITY = BETTER MENTAL PERFORMANCE

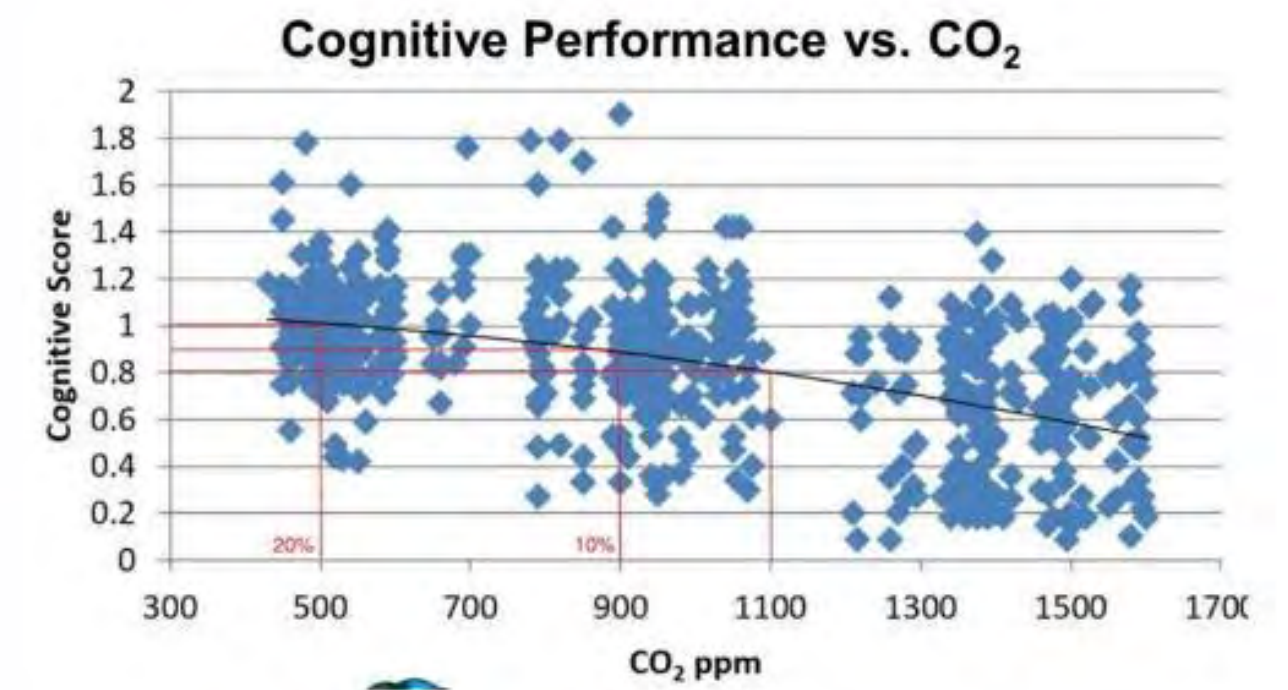
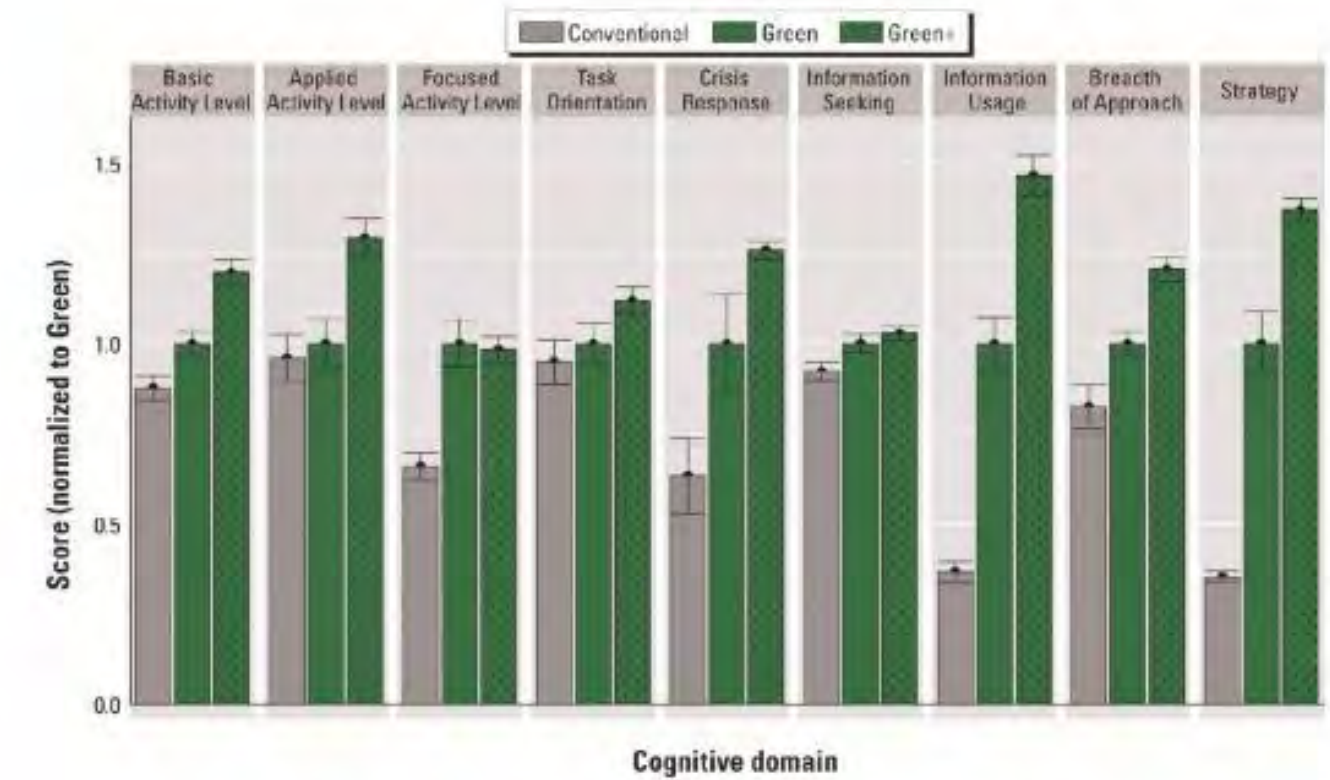
### COGNITIVE FUNCTION TEST SCORES DOUBLED

The COGfx Study demonstrated that improved indoor environmental quality doubled cognitive function test scores in the 24 study participants.

[READ MORE](#)

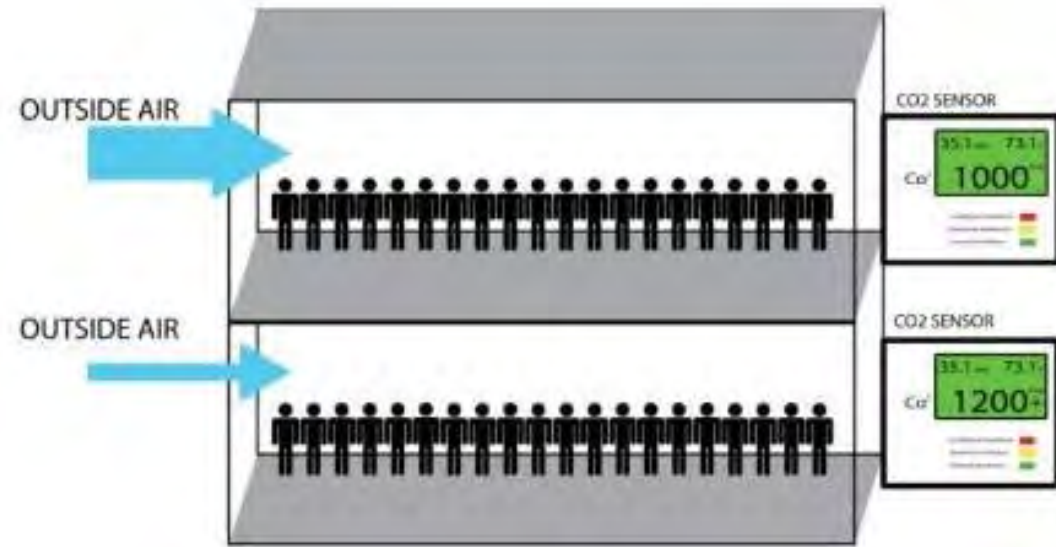


NASA noted changes that include not just headaches and lethargy but also **“not following procedure” ...**

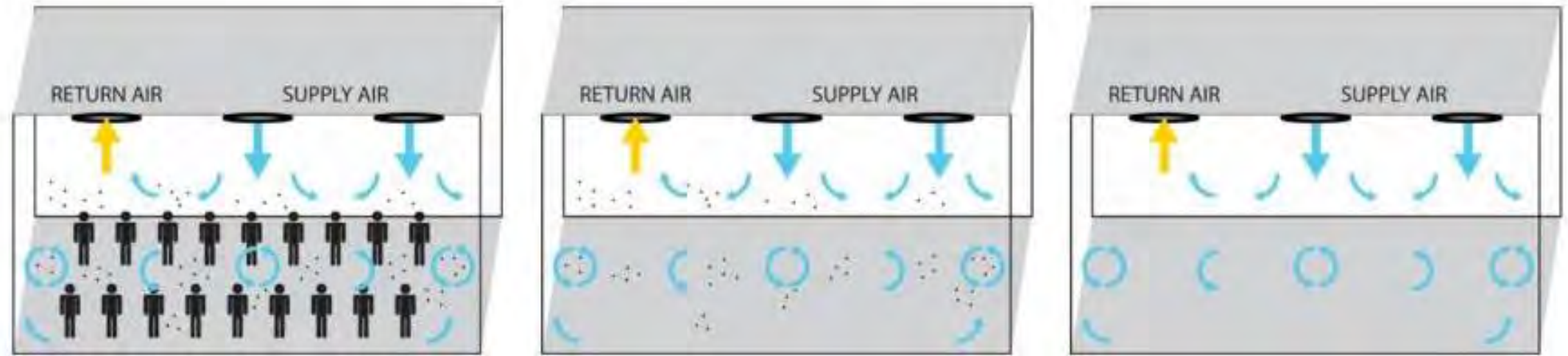


# HEALTH & WELLNESS

## STUDENT SUCCESS | INCREASE COGNITIVE FUNCTION



DEMAND CONTROLLED VENTILATION



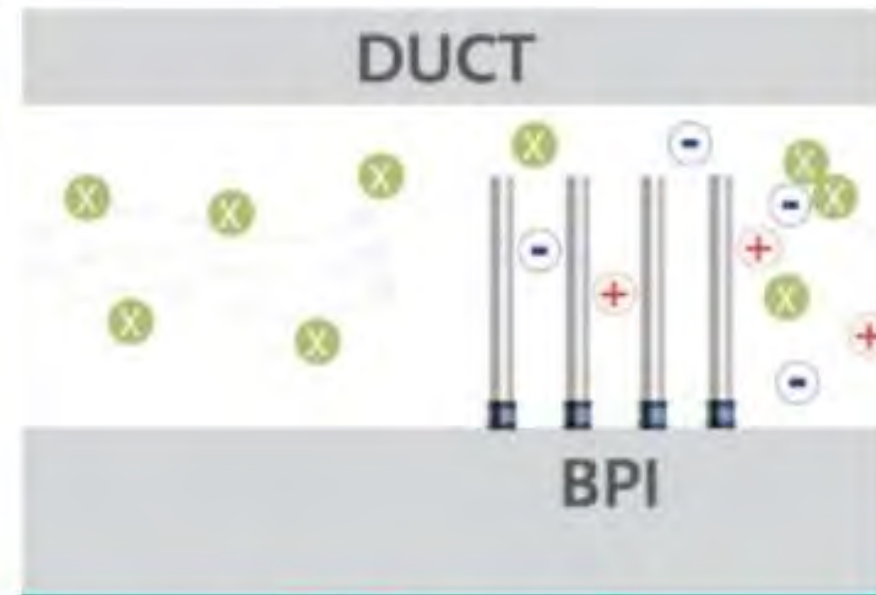
CLASSROOM CO<sub>2</sub> FLUSH



MERV 13 FILTER READY



UV LIGHTS



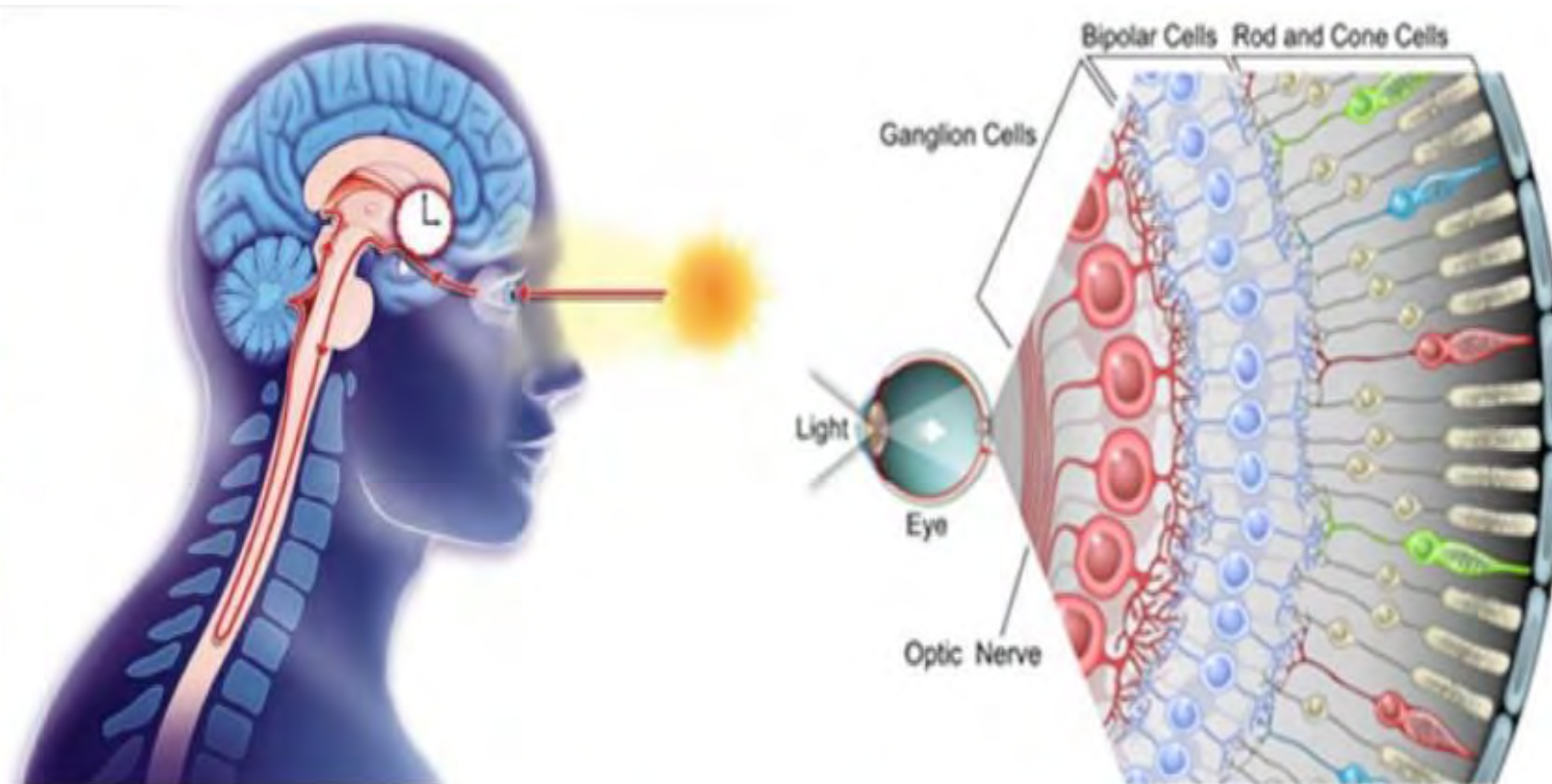
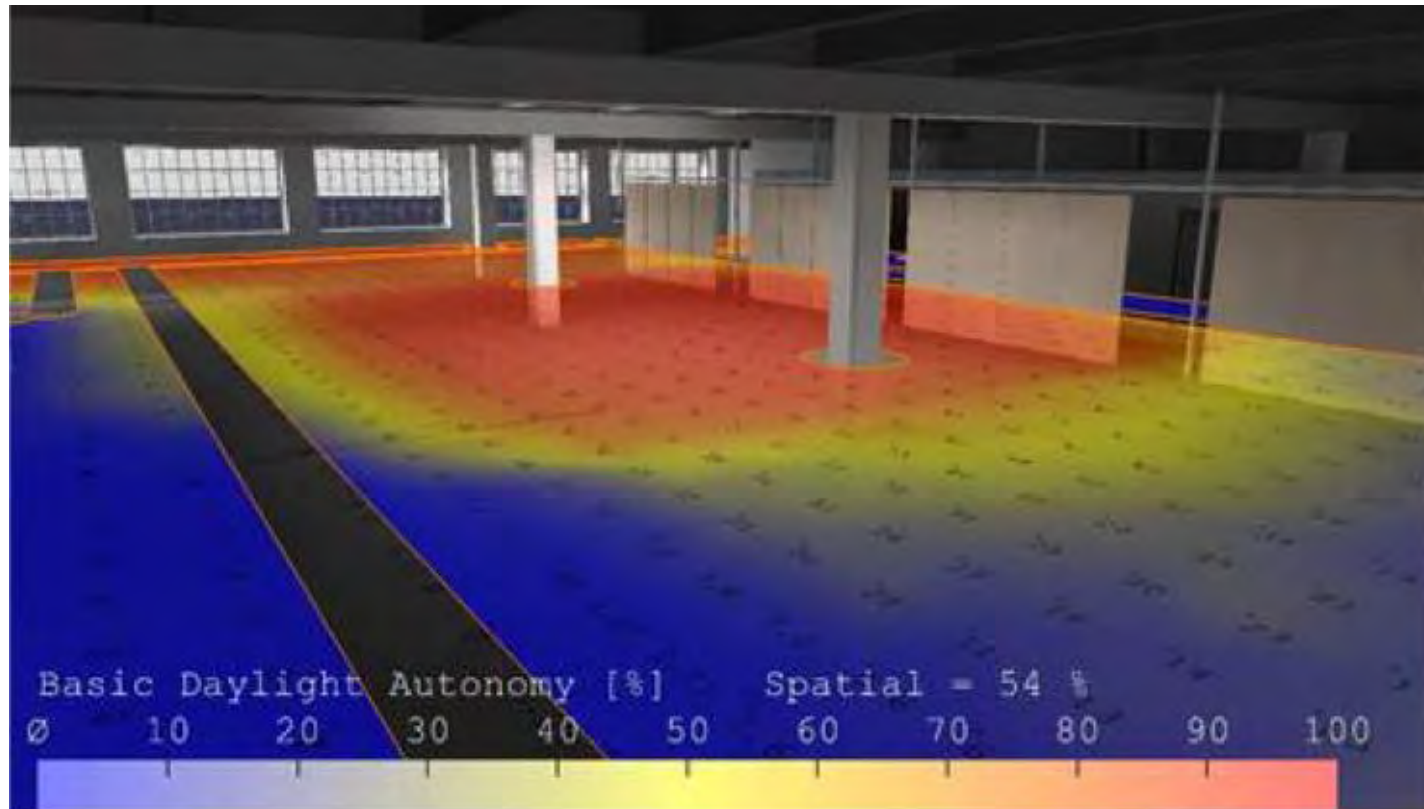
BIPOLAR IONIZATION  
(Does NOT Reduce CO<sub>2</sub>!)



DEHUMIDIFICATION

# HEALTH & WELLNESS

## BENEFITS OF DAYLIGHTING

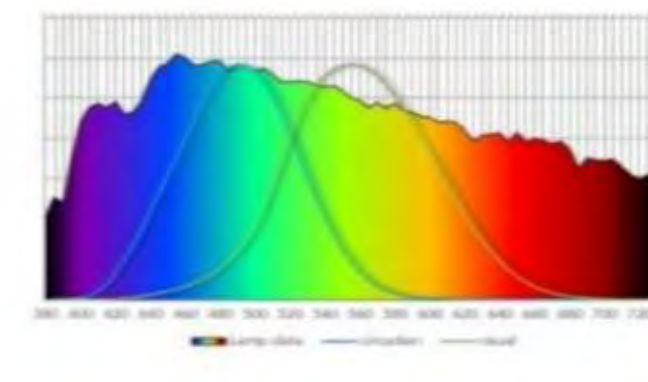
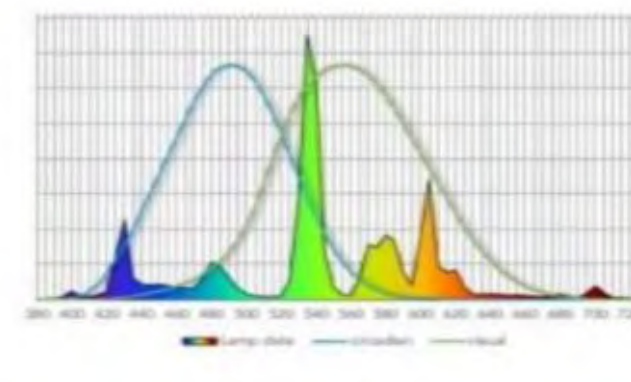
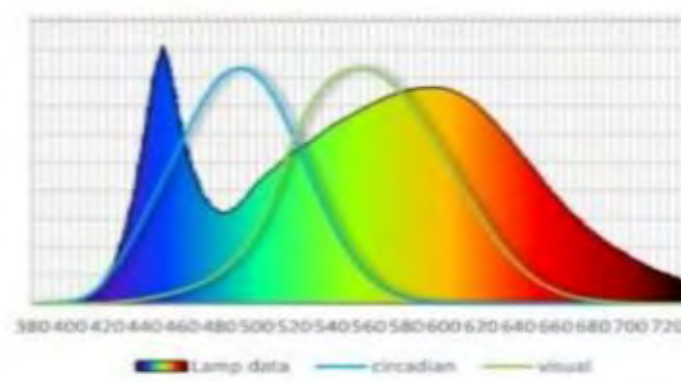
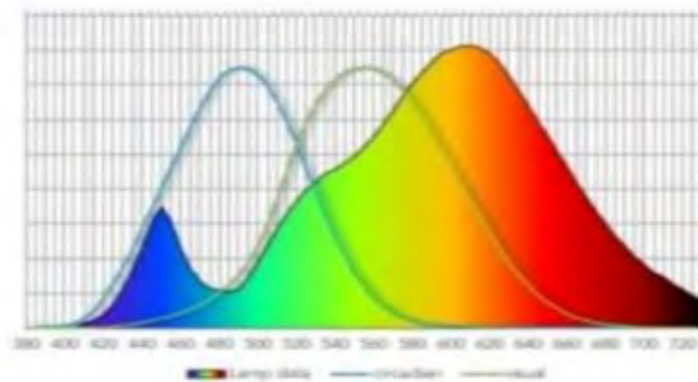


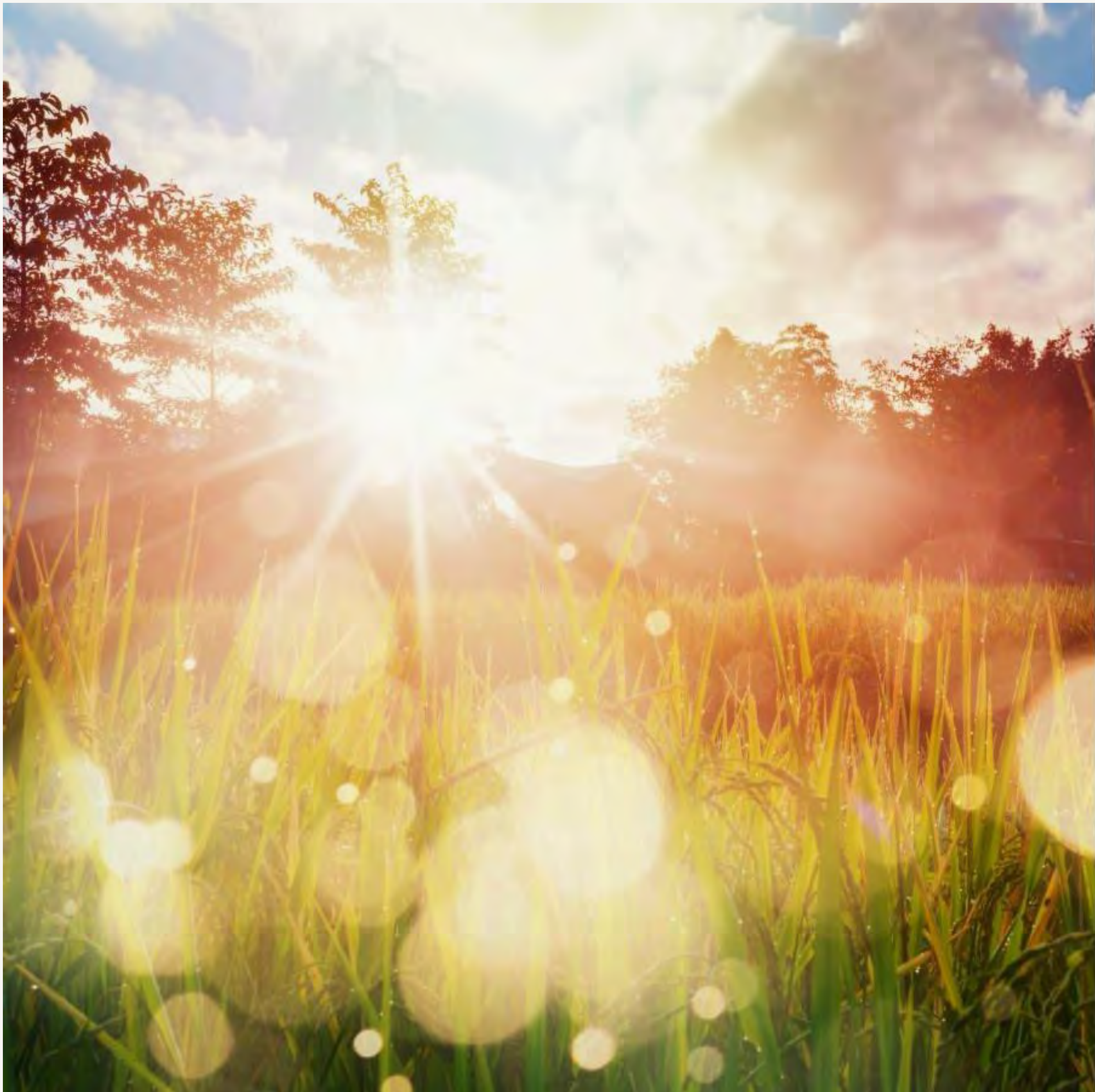
2700 K LED:  $R_M = 0.44$

4000 K LED:  $R_M = 0.76$

4000 K FLUORESCENT:  $R_M = 0.59$

NATURAL LIGHT:  $R_M = 1.13$





## **Daylight improves test scores in three school systems by up to 26%**

The Benefits of Daylighting.  
Northwest Energy Efficiency  
Alliance





**“...there was on average a 21% improvement in student learning rates.”**

(2009, June). Boulder School Installs Daylighting Device. The Daily Journal, McGraw-Hill Construction



**“...light exposure has an impact on the mood and reduces symptoms of depression in individuals.”**

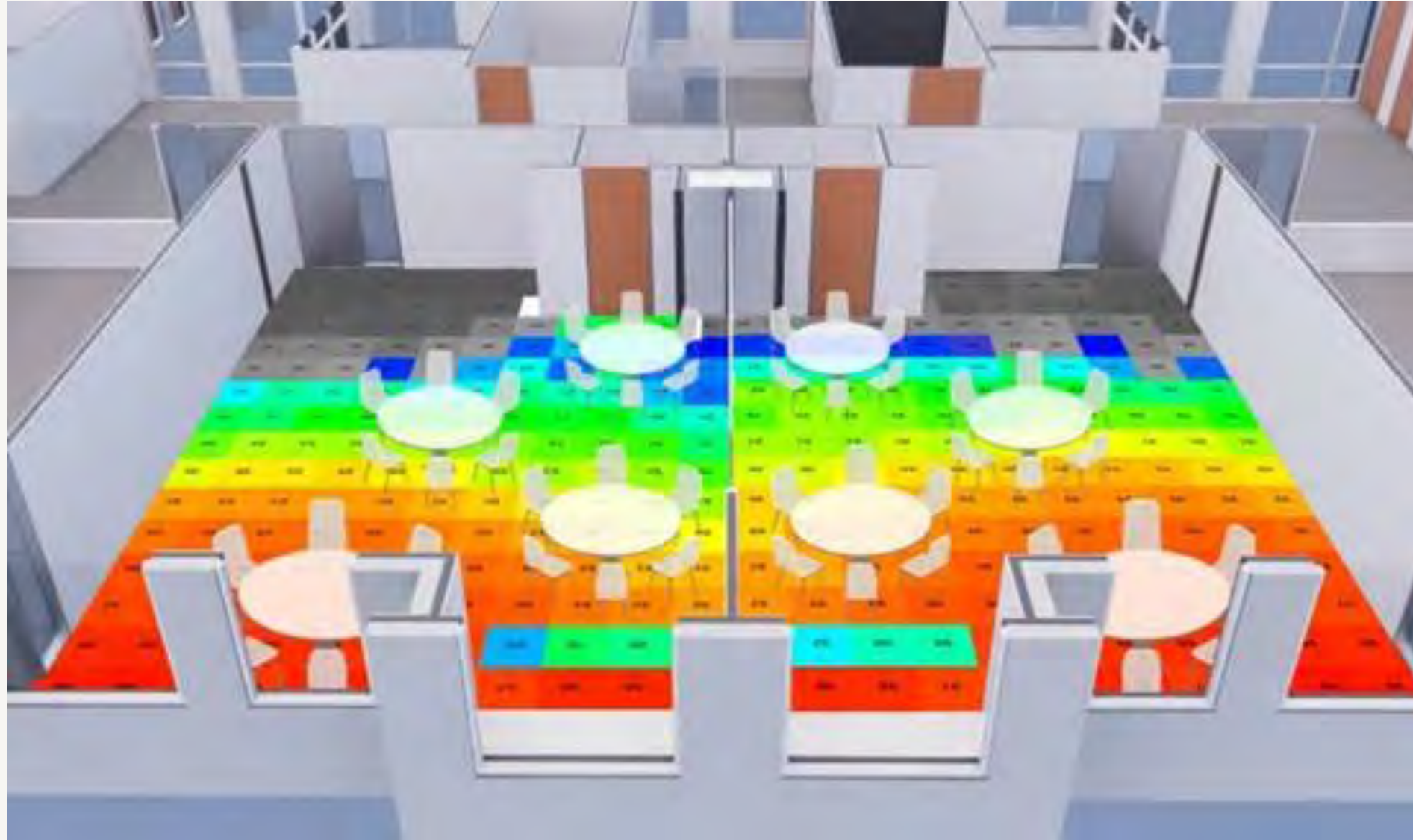
Taylor, Shaun. 2019.

Incorporating Productivity Improvements Into Cost-Benefit Analyses of Lighting

# HEALTH & WELLNESS

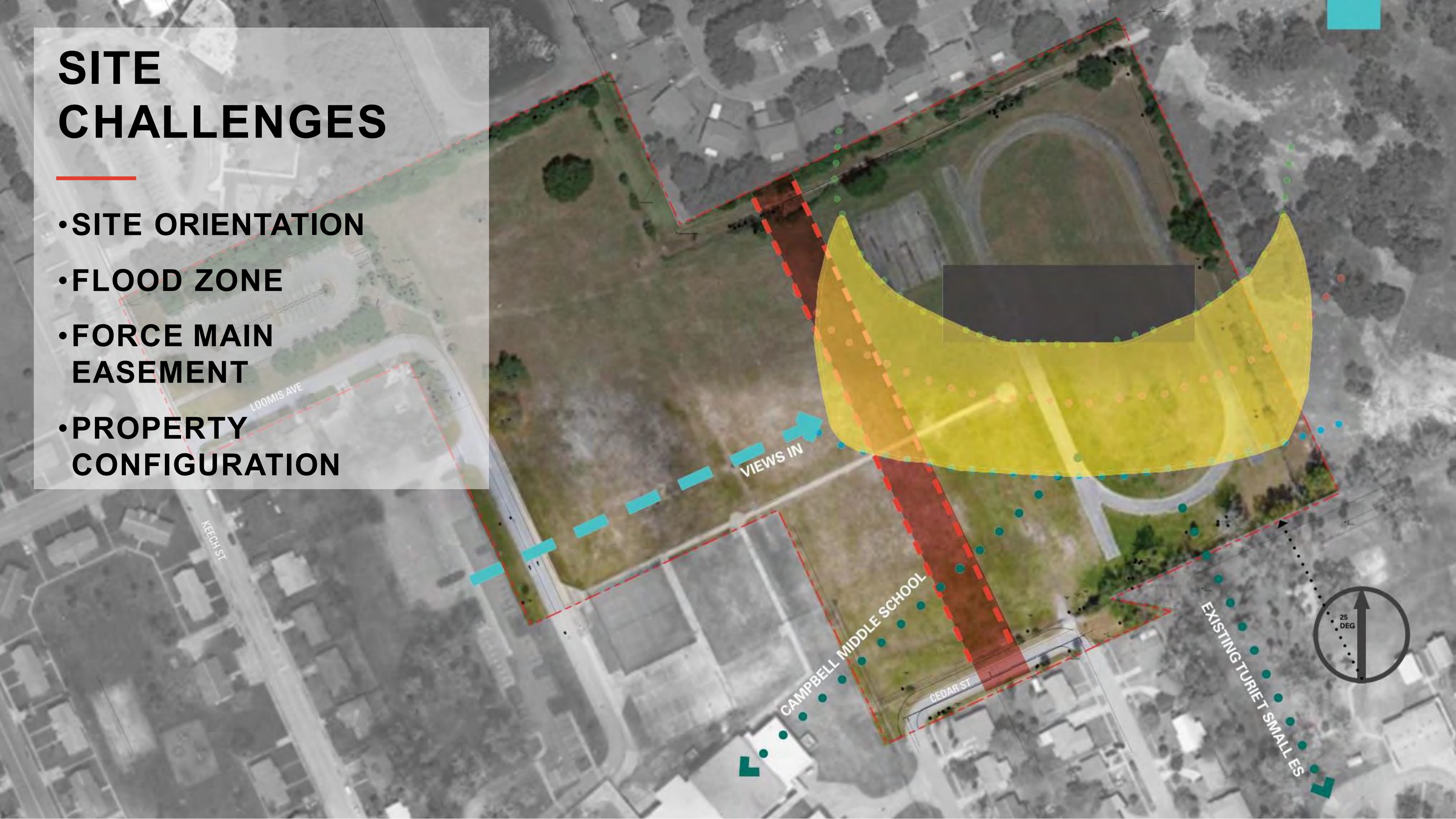
---

## THE BENEFITS OF INTEGRATIVE DESIGN



# SITE CHALLENGES

- SITE ORIENTATION
- FLOOD ZONE
- FORCE MAIN EASEMENT
- PROPERTY CONFIGURATION

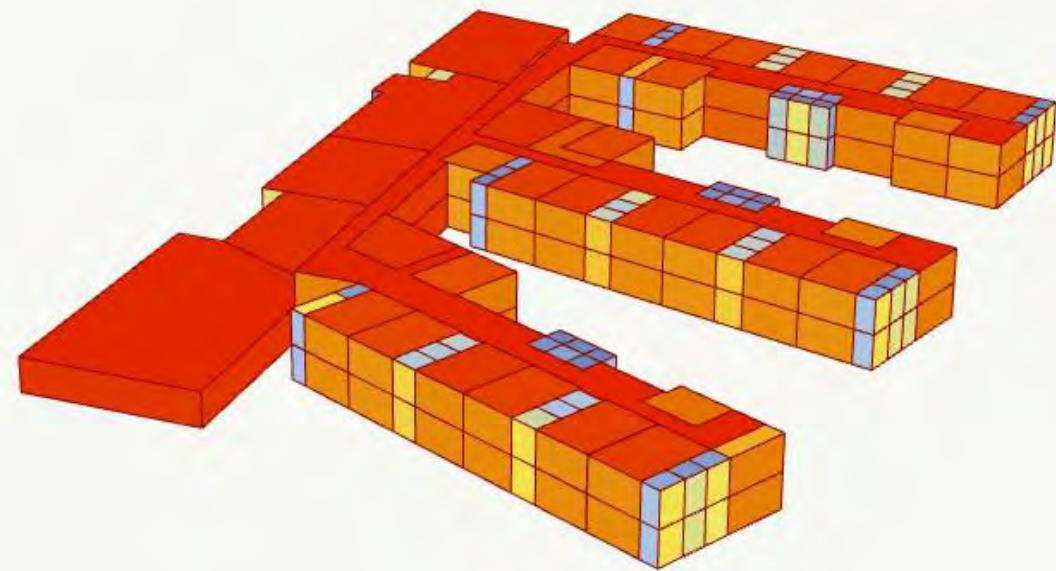


# CONCEPT EUI COMPARISONS

---

23.6

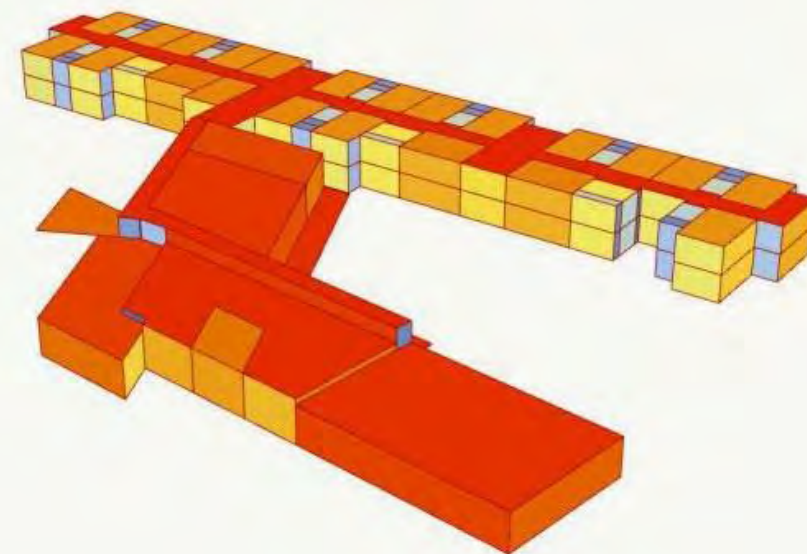
EUI



OPTION 1

23.3

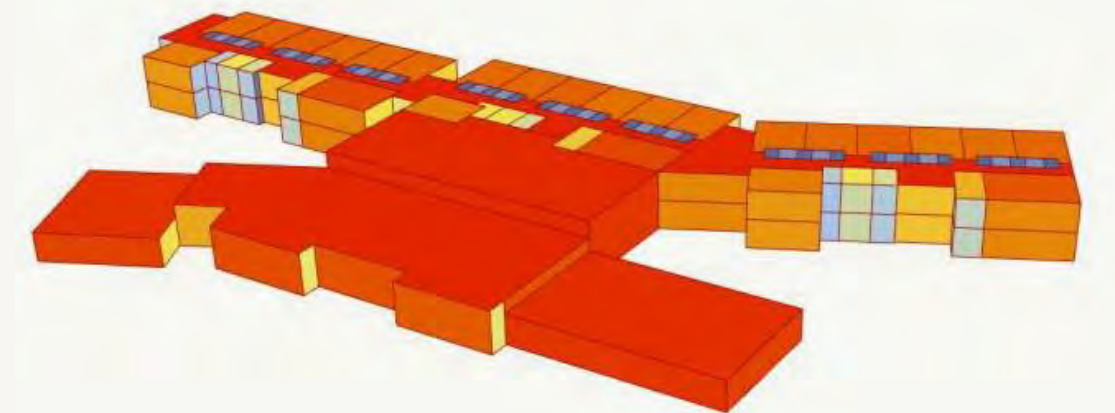
EUI



OPTION 2

22.8

EUI







OPTION 3

# SITE DESIGN

## Safety and Security

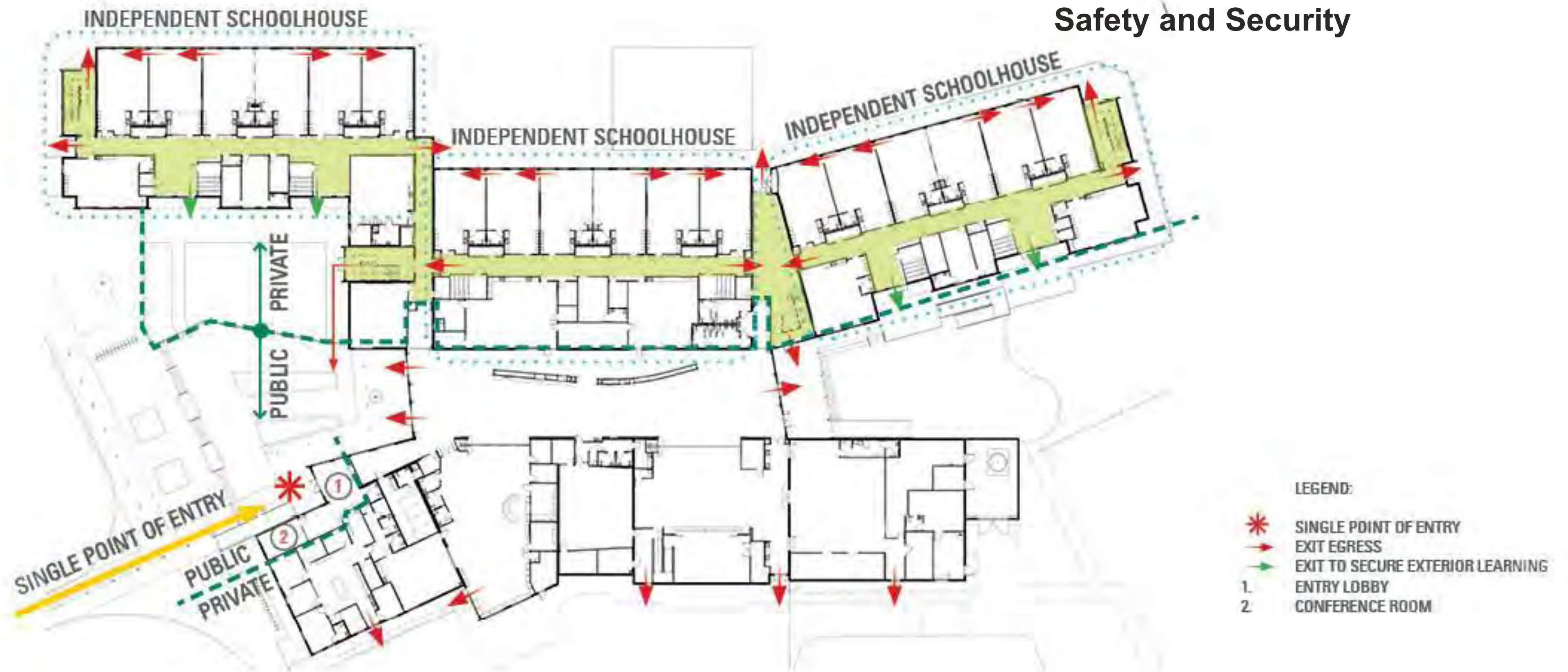
LEGEND:

-  SINGLE POINT OF ENTRY
  -  BUILDING SECURITY
  -  VEHICLE SECURITY
  -  SITE PERIMETER SECURITY
1. COMMUNITY FIELD
  2. PARENT DROP OFF
  3. BUS LOOP
  4. SERVICE
  5. PE BUILDING & COVERED PLAY
  6. ENTRY PLAZA
  7. OUTDOOR DINING
  8. KINDERGARTEN PLAY
  9. OUTDOOR PLAY
  10. OUTDOOR LEARNING
  11. RETENTION






# BUILDING DESIGN

## Safety and Security



### LEGEND:

-  SINGLE POINT OF ENTRY
-  EXIT EGRESS
-  EXIT TO SECURE EXTERIOR LEARNING
- 1. ENTRY LOBBY
- 2. CONFERENCE ROOM

# LEARNING ENVIRONMENT STRATEGIES

---





# IMMERSIVE LEARNING

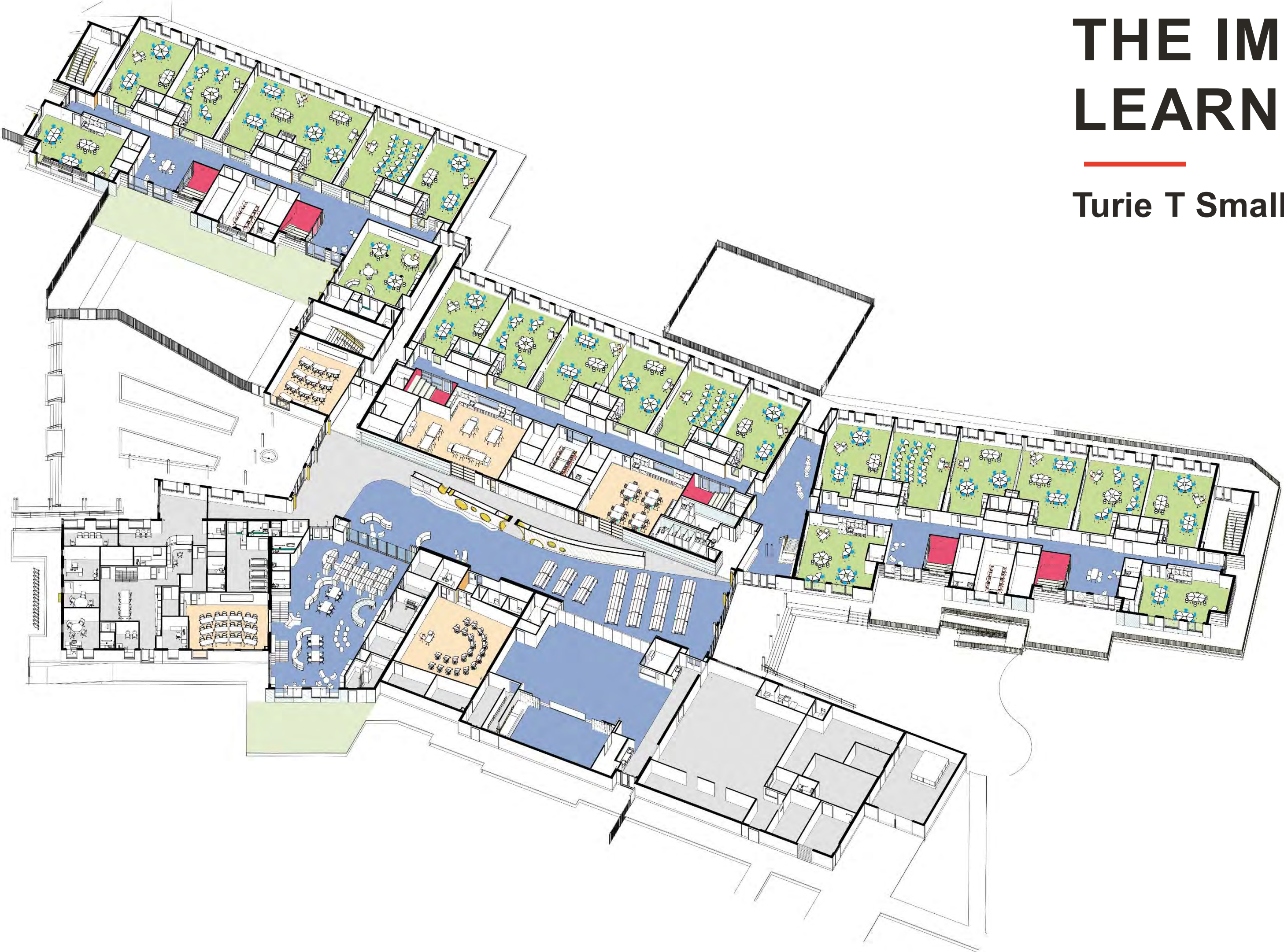


Learning is  
Everywhere




# THE IMMERSIVE LEARNINGSCAPE


Turie T Small





**LEGEND**


 SINGLE POINT OF ENTRY

- 1. ADMINISTRATION
- 2. MEDIA
- 3. DINING
- 4. MULTI-PURPOSE
- 5. MUSIC
- 6. ART
- 7. MAKER SPACE
- 8. SKILLS
- 9. SKILLS (ADULT ED.)
- 10. KITCHEN

 DISCOVER

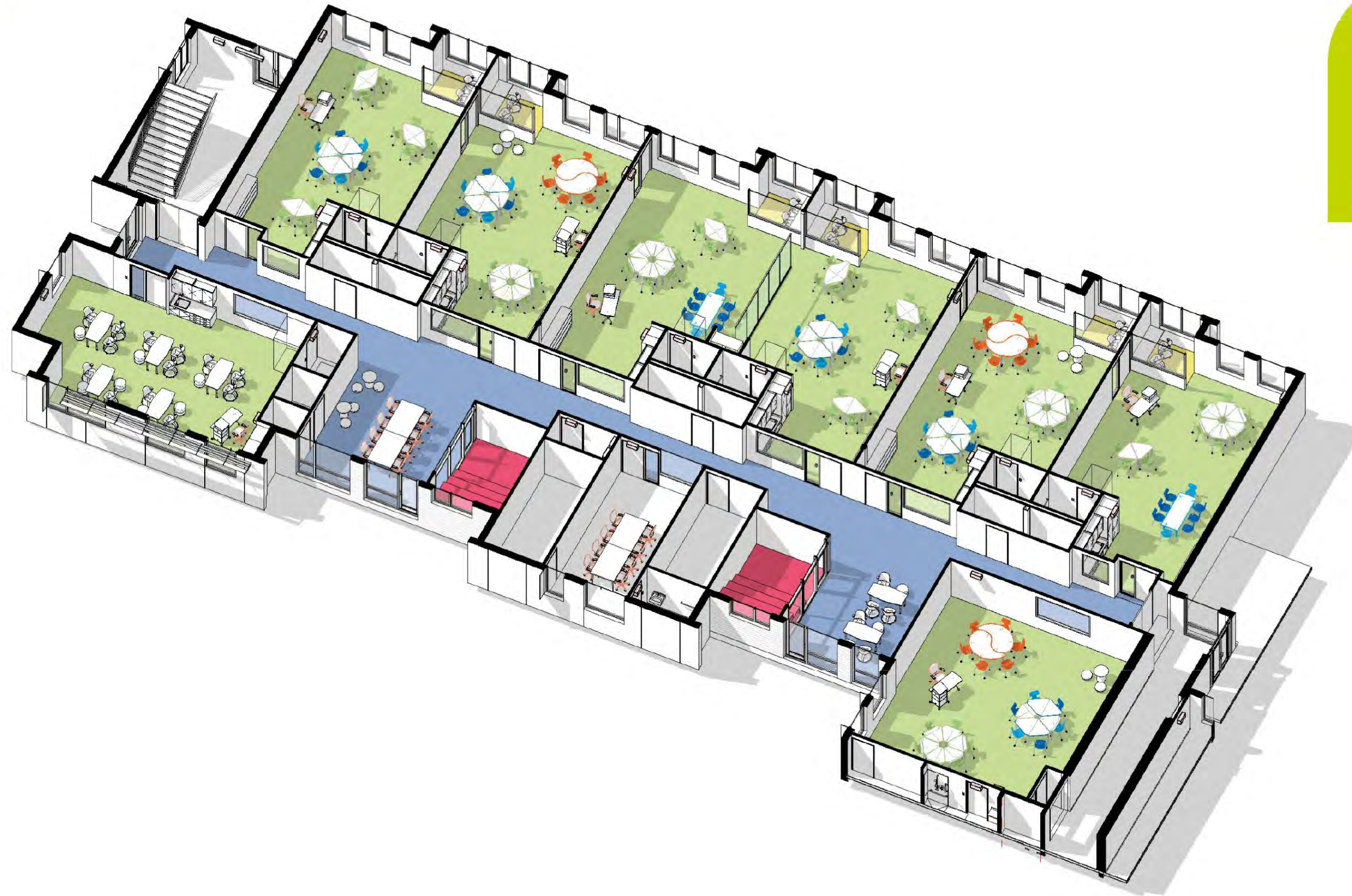
 EXCHANGE

 IMPART

 CREATE - CLASSROOM

# IMMERSIVE LEARNING - SCHOOLHOUSE

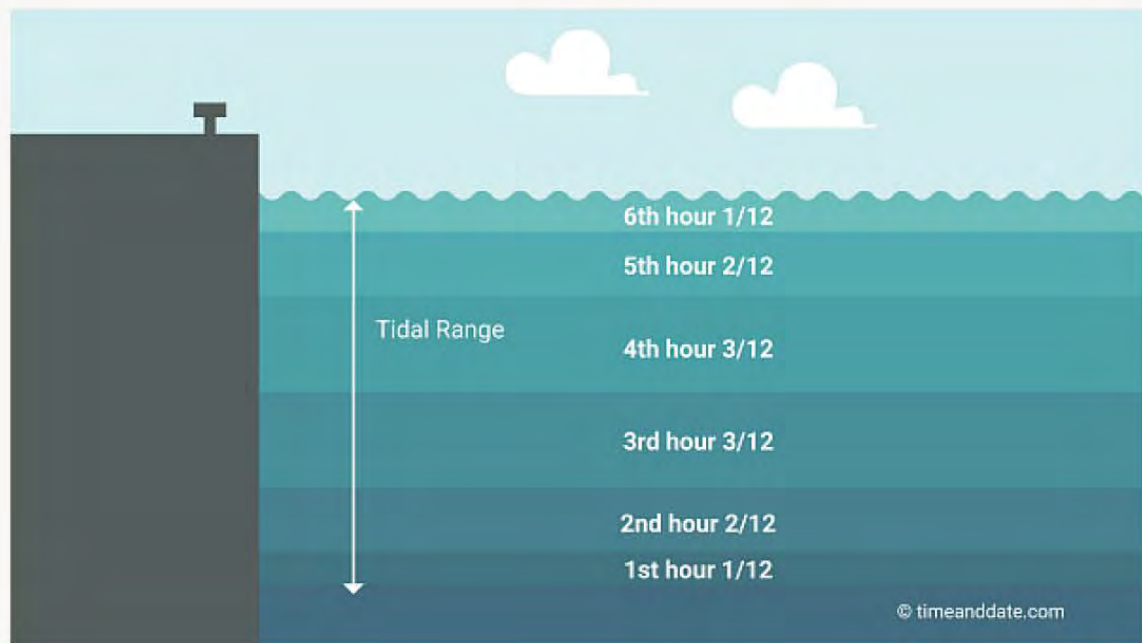
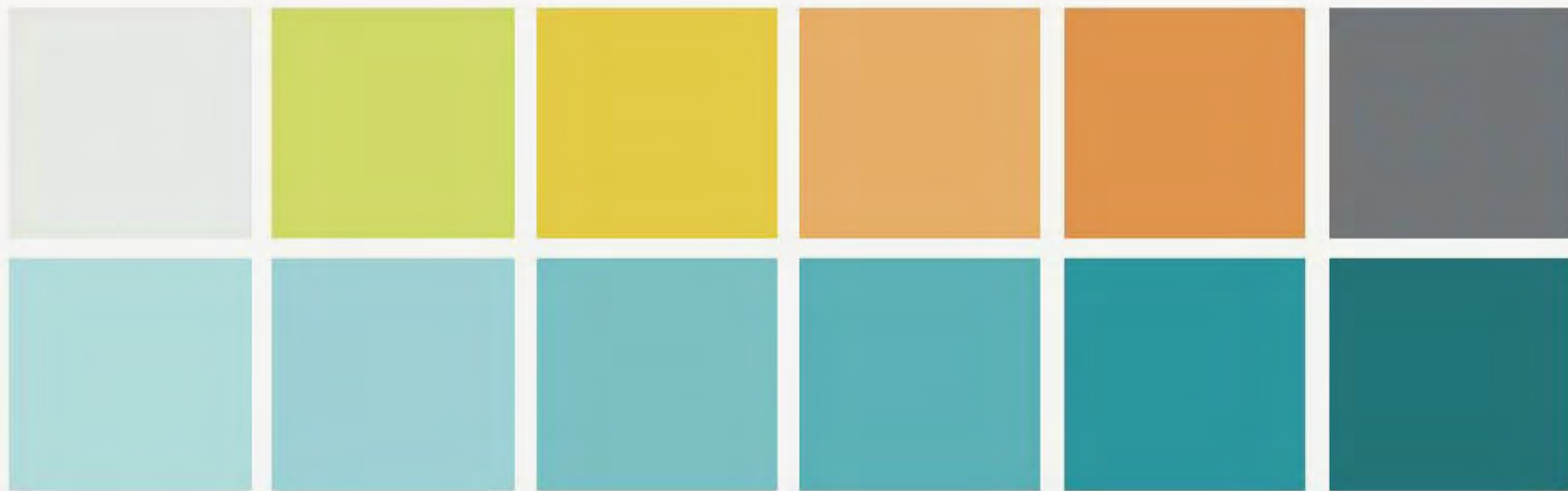
**Immersive Learning  
spaces that support  
& enhance curriculum**



- CREATE - TEAM
- DISCOVER
- EXCHANGE
- THINK
- IMPART
- CREATE - CLASS

# BUILDING DESIGN CONCEPT

## EBB AND FLOW





TURIET SMALL

WELCOME



# EXCHANGE

# DISCOVER





**IMPART**



# CREATE





# EXCHANGE



EXCHANGE

# COMMITMENT TO REGENERATIVE DESIGN

---

H



## HEALTH

We will design environments that elevate health and wellness.

E



## ENERGY

We will use a smart, responsible design approach to reduce the energy demand of our projects.

W



## WATER

We will design for the preservation and conservation of water.

S



## SOCIAL EQUITY

We will address universal design and social inequities through empathetic and intentional planning.



### ENERGY PRODUCTION

SOLAR PANELS (AS PART OF FUTURE PROJECT) PROVIDE SITE ENERGY PRODUCTION, OFF-SETTING BUILDING ENERGY USE TO ACHIEVE NET-ZERO



### COMMUNITY RESOURCE

EXTERIOR GATHERING SPACE FOR SCHOOL AND COMMUNITY EVENTS



### RESILIENCY

BUILDING RAISED BY 2' TO REDUCE FLOODING RISK DUE TO LOCATION



### HIGH PERFORMANCE ENVELOPE

HERMETICALLY SEALED BUILDING ENVELOPE FOR LOW AIR LEAKAGE RATE



**HEWS**

-  HEALTH
-  ENERGY
-  WATER
-  SOCIAL EQUITY





\*NATIONAL AVERAGE K-12 SCHOOLS = 68

23  
E.U.I.\*

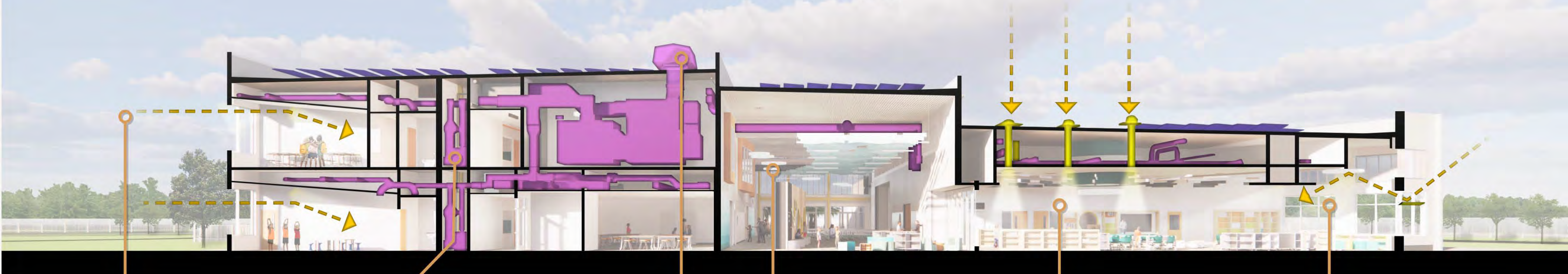
\$252,500  
PER YEAR  
SAVINGS\*\*

15 YR  
R.O.I.

**HEWS**

-  HEALTH
-  ENERGY
-  WATER
-  SOCIAL EQUITY

\*\* High Performance Savings = \$163,500 py  
+ Photovoltaic Savings = \$89,000 py



 DAYLIGHTING

 HIGH PERFORMANCE HVAC  
DISTRIBUTED HEAT PUMPS TO  
REDUCE ENERGY LOAD AND AVOID  
CLASSROOM DISRUPTION FROM  
MAINTENANCE

 COMMUNITY HUB  
FLEXIBLE FOR USE OUTSIDE  
SCHOOL HOURS

 INDOOR AIR QUALITY  
DEDICATED OUTDOOR AIR  
SYSTEM MAINTAINS LOW CO2  
LEVELS, IMPROVING STUDENT'S  
ABILITY TO CONCENTRATED

 ENERGY REDUCTION  
BRINGS NATURAL LIGHT  
DEEP INTO A SPACE,  
REDUCING ARTIFICIAL ENERGY  
USAGE

 GLARE CONTROL  
EXTERIOR SHADING TO  
PROVIDE A FOCUSED,  
DISTRACTION FREE,  
LEARNING ENVIRONMENT

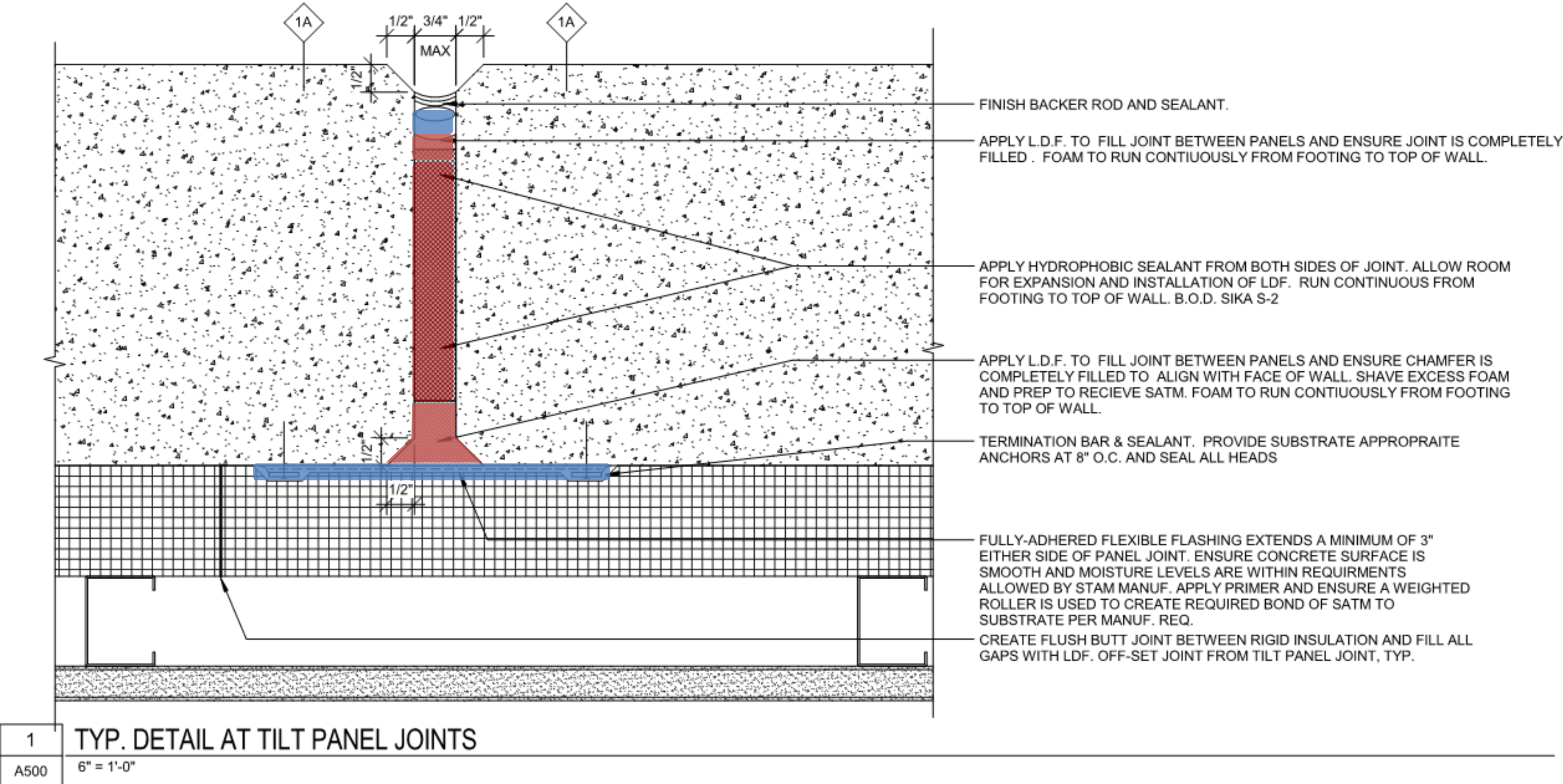


# NEXT STEPS

CONSTRUCTION  
AND  
POST OCCUPANCY

# “BELT & SUSPENDERS”

## APPROACH TO RISK MANAGEMENT



1 TYP. DETAIL AT TILT PANEL JOINTS  
 A500 6" = 1'-0"



TESTING



AND MORE TESTING



# POST OCCUPANCY

---

- Ongoing resolution of issues with City of Daytona Beach (replacement/relocation of force-main, compensating water storage)
- Having teachers trained to use school
- Monitoring energy use – researching financing for photovoltaic array



# CONTROLS & COMMISSIONING

---

- Completed the controls after occupancy
- Identified a missing blank-off from the energy recovery wheel
- Running extra reheat to dehumidify until the building was under control
- No summer schedule for building conditioning – Conditioning 75% of the building for the office space



# OCCUPANCY & OPERATIONS SURPRISES

---

- Janitor hours added after design and reduced impact to a floor-by-floor cleaning to un-occupy
- HVLV fans operating 24-7
- Added a hydroponics lab
- Monitors not turned off when the building is unoccupied
- 2020 Extended ventilation schedules (COVID related)





**THANK  
YOU!**

**LITTLE**<sup>®</sup>  
DIVERSIFIED ARCHITECTURAL CONSULTING