EASTSIDE EARLY COLLEGE AND INTERNATIONAL HIGH SCHOOLS AT ORIGINAL ANDERSON CAMPUS

Department Head Review– January 17, 2019

PERKINS+WILL

DESIGN DEVELOPMENT REVIEW

PROJECT OVERVIEW

SUMMARY

Project Budget:

$80.7M Total Project Budget

$63.2M Construction Budget

Project Schedule:

Design

Construction Documents: May 24, 2019

Construction

Abatement/Selective Demo Start: Fall 2018

Substantial Completion of Construction: June 2021

Project Delivery Method:

Construction Manager at Risk (CMAR)

Campus Architectural Team:

Miguel Garcia, Principal of Eastside Memorial ECHS

Leticia Vega, Principal at International HS

Yesica Diaz, EMHS ECHS Coordinator

Eric Ramos, Martin Middle School Faculty

Megan Buchanan, Eastside Memorial ECHS Faculty and Parent

Sanford Jeames, Eastside Memorial ECHS Faculty

Sean Storrud, International HS Faculty

Donna Drake, Eastside Memorial ECHS Campus Partner

Ofelia Zapata, PTSA President and Grandmother

Emily Sawyer, Vertical Team Parent

Michael Barron, Parent and Johnston Alumna

Vincent Tovar, Vertical Team Parent

Barbara Spears Corbett, Original L.C. Anderson HS Alumna

Linda Moore, Original L.C. Anderson HS Alumna

Pamela McCullough, Original L.C. Anderson HS Alumna

Design + Construction Team:

Architect- Perkins+Will

Civil Engineer- Civilitude

Landscape Architect- Coleman & Associates

Structural Engineer- IES

MEP Engineer- Jose I. Guerra

Technology- True North

Food Service- Worrell Design Group

Construction Manager- Cadence McShane

COMMUNITY WORKSHOP

STUDENT WORKSHOP

FACULTY WORKSHOP

DEPARTMENT MEETINGS

STAKEHOLDER TOURS

STUDENT TOURS

BRAND + HISTORY WORKSHOP

PROCESS TO DATE

Engagements

4 Community Visioning Workshops

5 Community Presentations

2 Student Workshops

2 Faculty Programming Meetings

2 AISD Departmental Reviews

3 School Tours with Stakeholders

1 Student School Tour

12 Historic Preservation Meetings

10 CAT Meetings

3 Faculty Workshops

2 City of Austin Commission Presentations

PLANNING CRITERIA

HISTORY

- The Road to Desegregation
- The Original L.C. Anderson Journey through the Years
- Anderson Legacy
- Anderson Alumni Group

COMMUNITY

- Original L.C. Anderson's role in East Austin
- Community Education
- Community Engagement

DIVERSITY

- Bilingual / Multilingual
- Countries Represented
- Languages Represented

ACADEMICS

- STEM
- Project Based Learning
- Quality of Education
- Academic Excellence
- College Preparation

ATHLETICS

- Panther Pride
- Yellow Jackets
- Team Sports
- Individual Sports
- Mascot / Colors
- Achievements

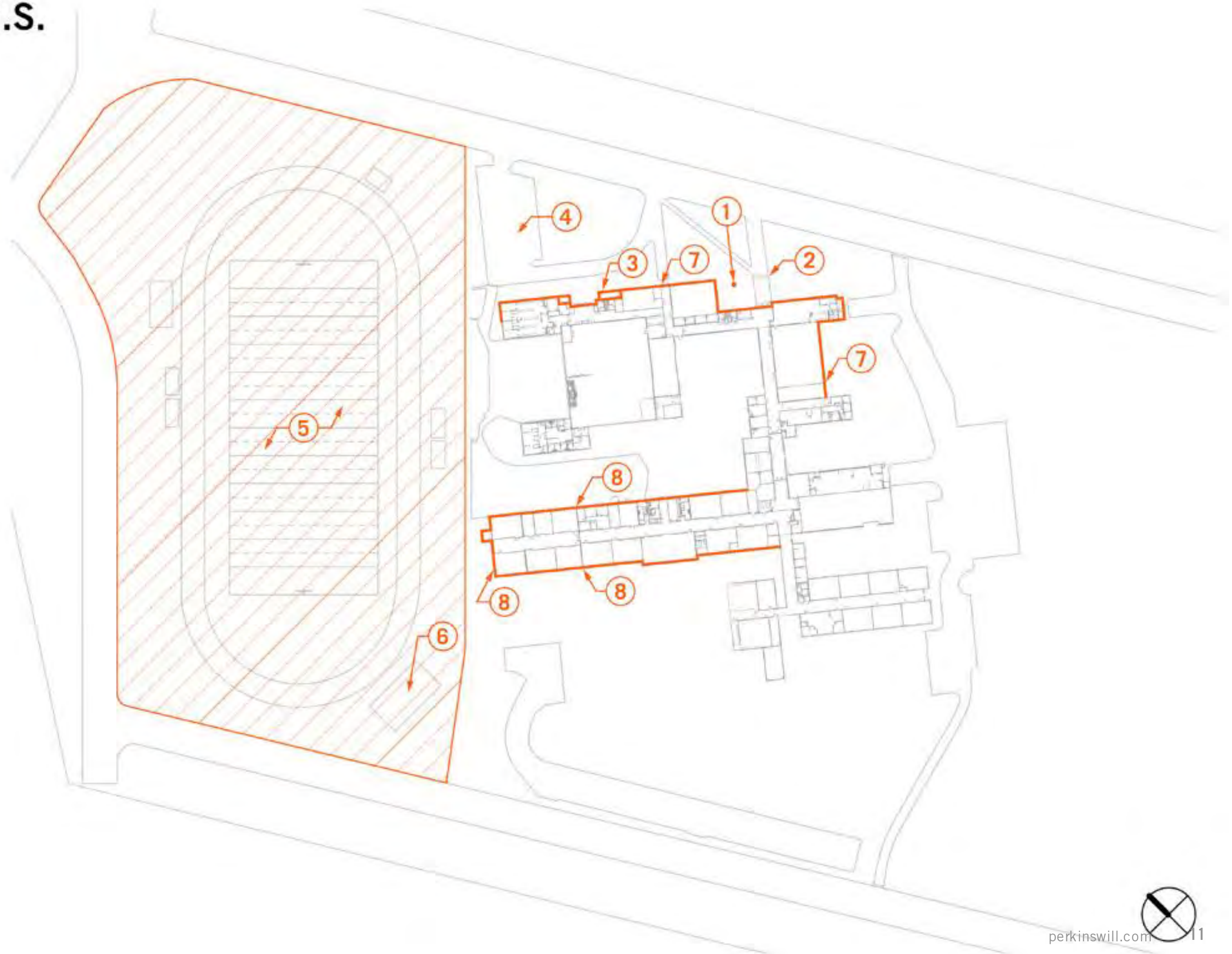
PERKINS+WILL

ORIGINAL L.C. ANDERSON H.S.

EXISTING FLOOR PLAN
EXTERIOR PRESERVATION

LEGEND

- FACADE TO BE REBUILT TO RECREATE LOOK AND FEEL OF ORIGINAL CONSTRUCTION
- AREA TO BE PRESERVED (WITH ADA AND CODE MODIFICATIONS AS NECESSARY)
- # REFER TO EXTERIOR KEYNOTES LIST
- TRUE NORTH

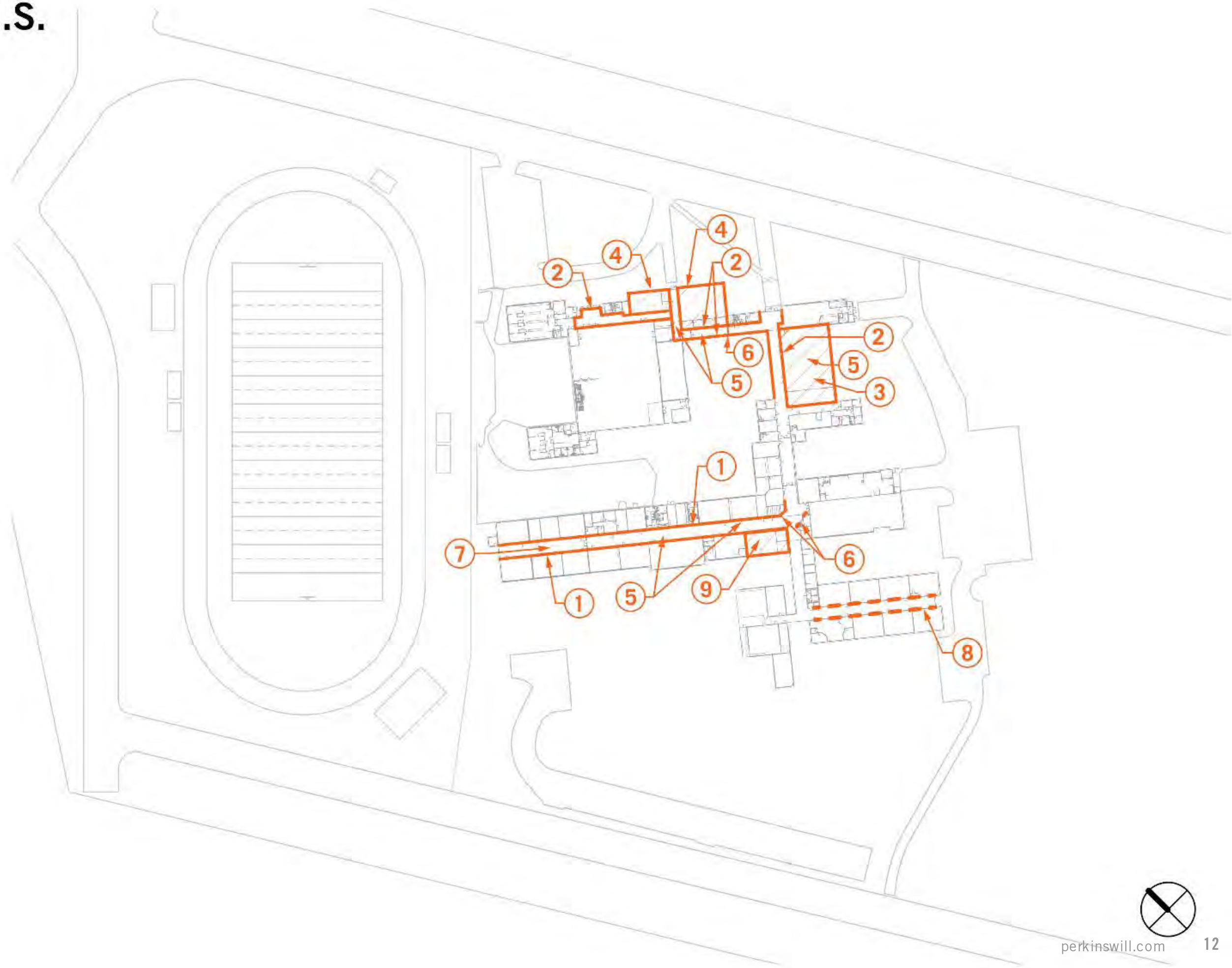


ORIGINAL L.C. ANDERSON H.S.

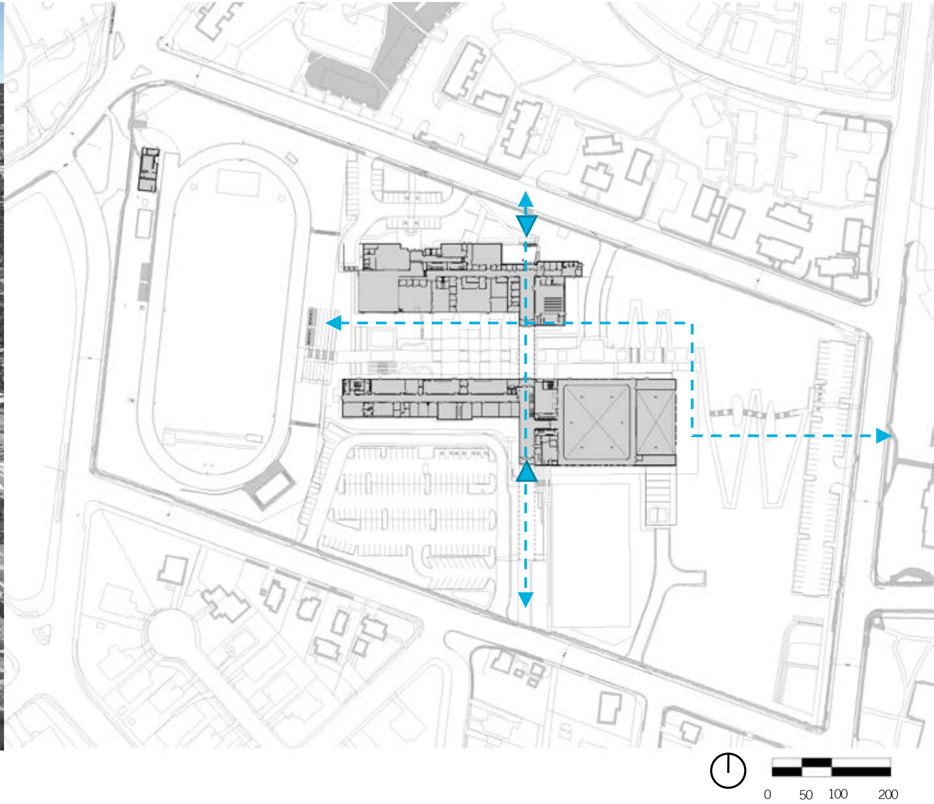
EXISTING FLOOR PLAN
INTERIOR PRESERVATION

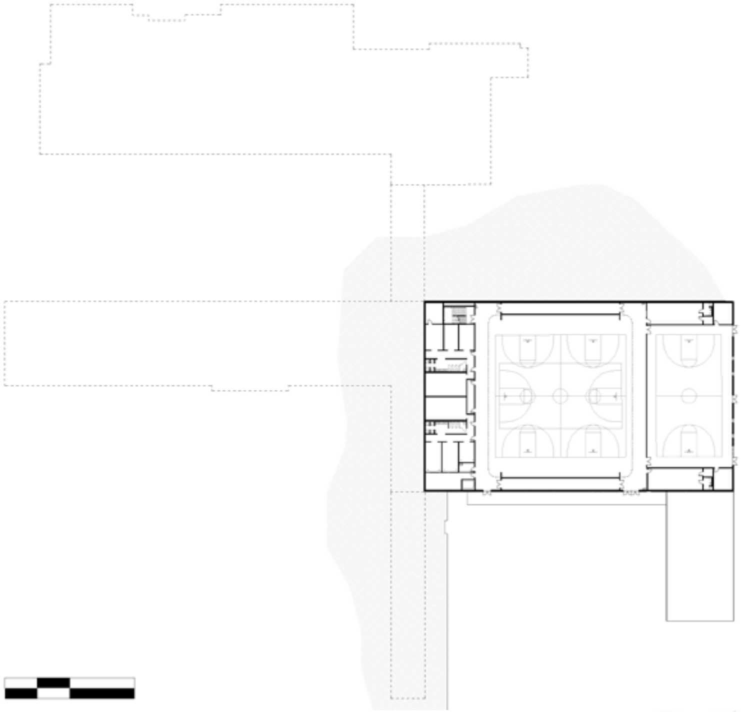
LEGEND

(solid orange line)	INTERIOR WALLS TO BE REBUILT TO RECREATE LOOK AND FEEL OF ORIGINAL CONSTRUCTION
(hatched orange box)	AREA TO BE RECONSTRUCTED (WITH ADA AND CODE MODIFICATIONS AS NECESSARY)
#	REFER TO INTERIOR KEYNOTES LIST
(dashed orange line)	AREA OF ITEMS TO BE SALVAGED
(north symbol)	TRUE NORTH



EASTSIDE MEMORIAL ECHS AND INTERNATIONAL HIGH SCHOOL AT THE SITE OF THE ORIGINAL L.C. ANDERSON HIGH SCHOOL





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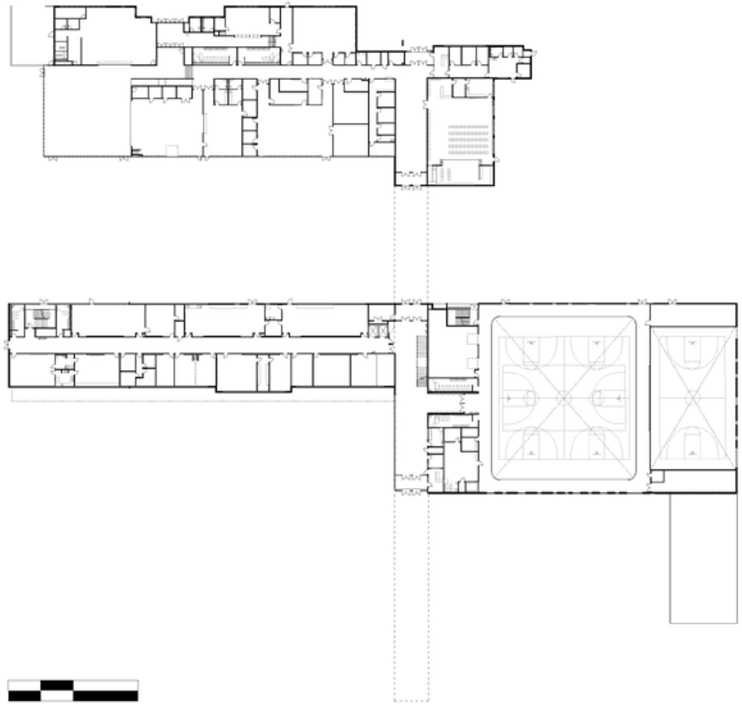
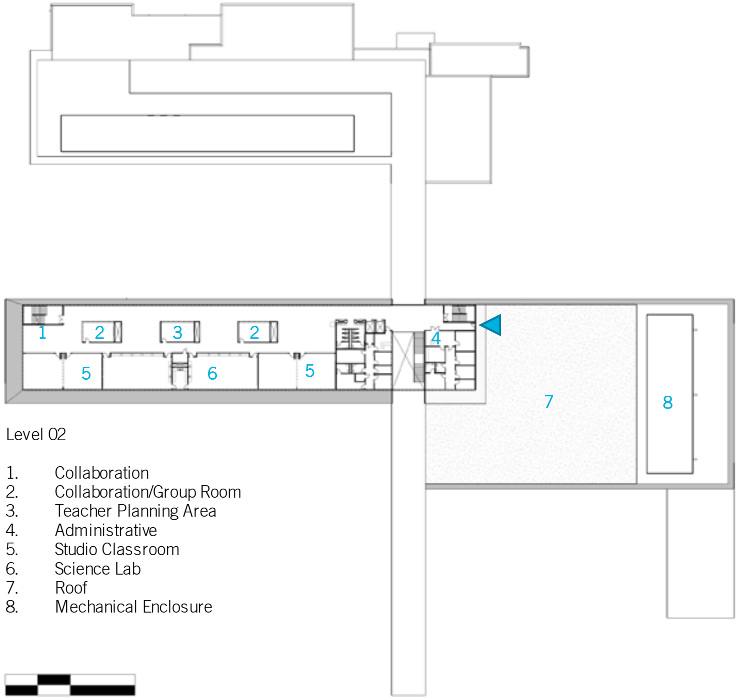
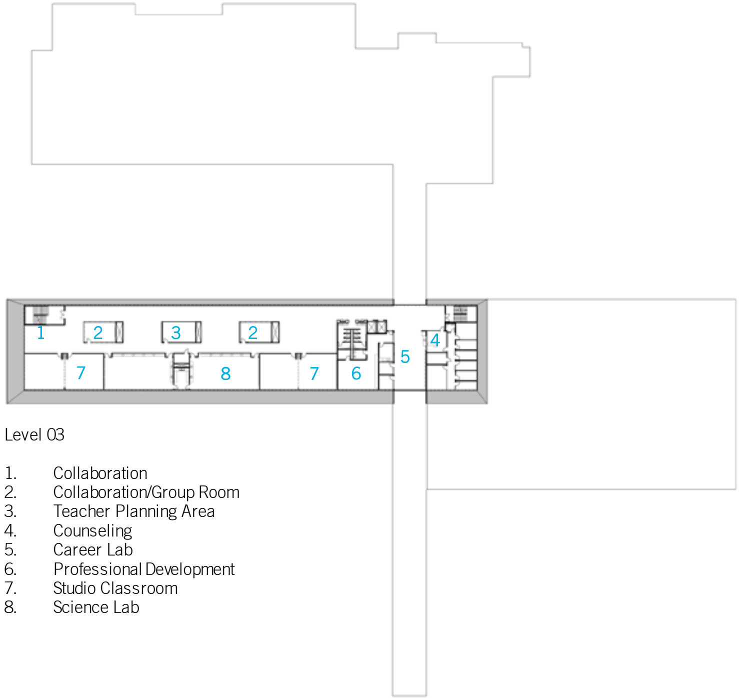


12. Track
13. Administration
14. Audio/Visual + Graphics Lab
15. Life Skills



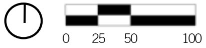
Level 02

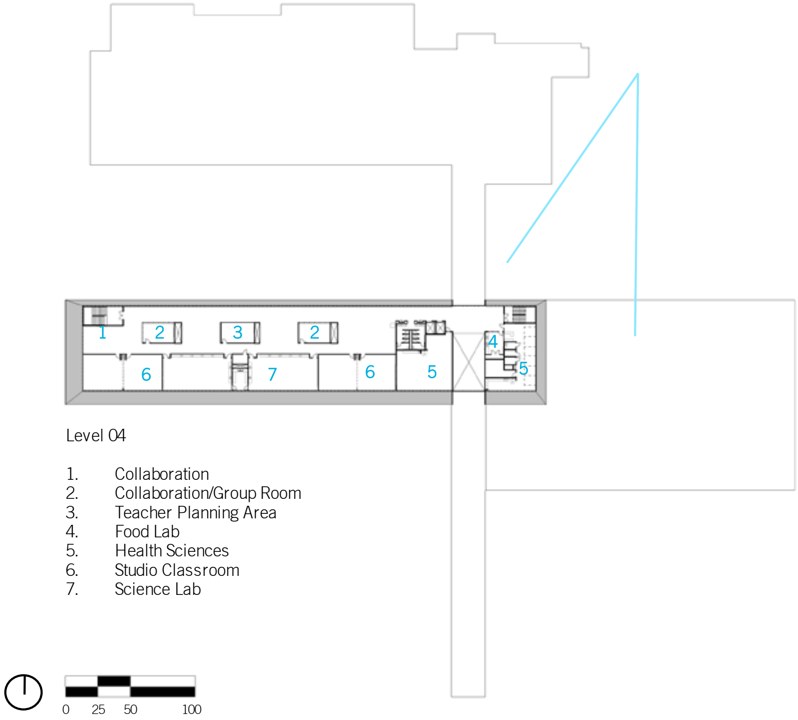
1. Collaboration
2. Collaboration/Group Room
3. Teacher Planning Area
4. Administrative
5. Studio Classroom
6. Science Lab
7. Roof
8. Mechanical Enclosure



Level 03

1. Collaboration
2. Collaboration/Group Room
3. Teacher Planning Area
4. Counseling
5. Career Lab
6. Professional Development
7. Studio Classroom
8. Science Lab





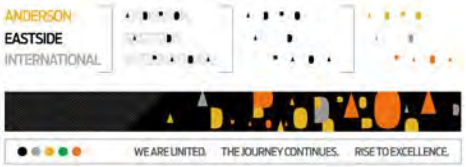
Level 04

1. Collaboration
2. Collaboration/Group Room
3. Teacher Planning Area
4. Food Lab
5. Health Sciences
6. Studio Classroom
7. Science Lab

INTERIOR + BRANDING

Design Concepts

GRAPHIC SYSTEM + MESSAGING




THE JOURNEY CONTINU
ARE
UNITED.
HOME OF THE
PANTHE

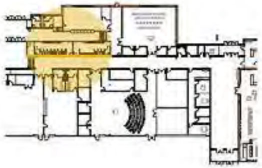
THE ORIGINAL L.C. ANDERSON
1907 - 1971

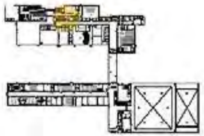
ANDERSON

Design Concepts

THE PAST

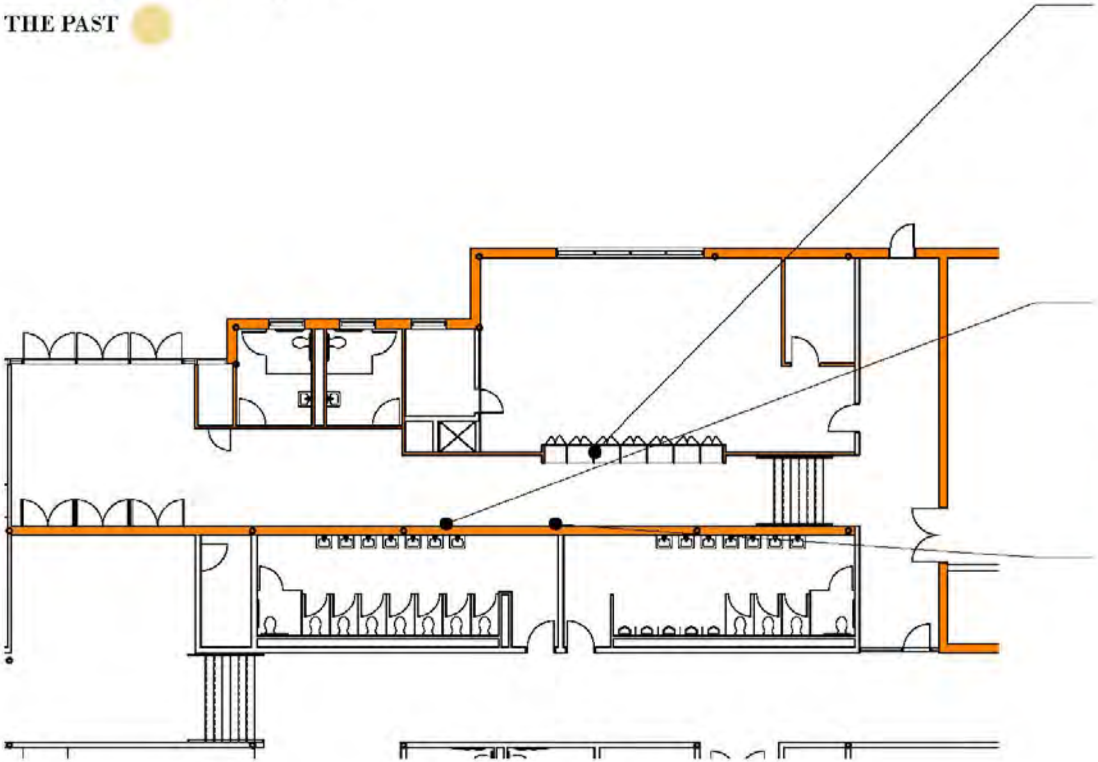
600 Wing - Historic Corridor





Design Concepts

THE PAST



600 Wing - Historic Gallery and Community Room

Double-sided Display Cases

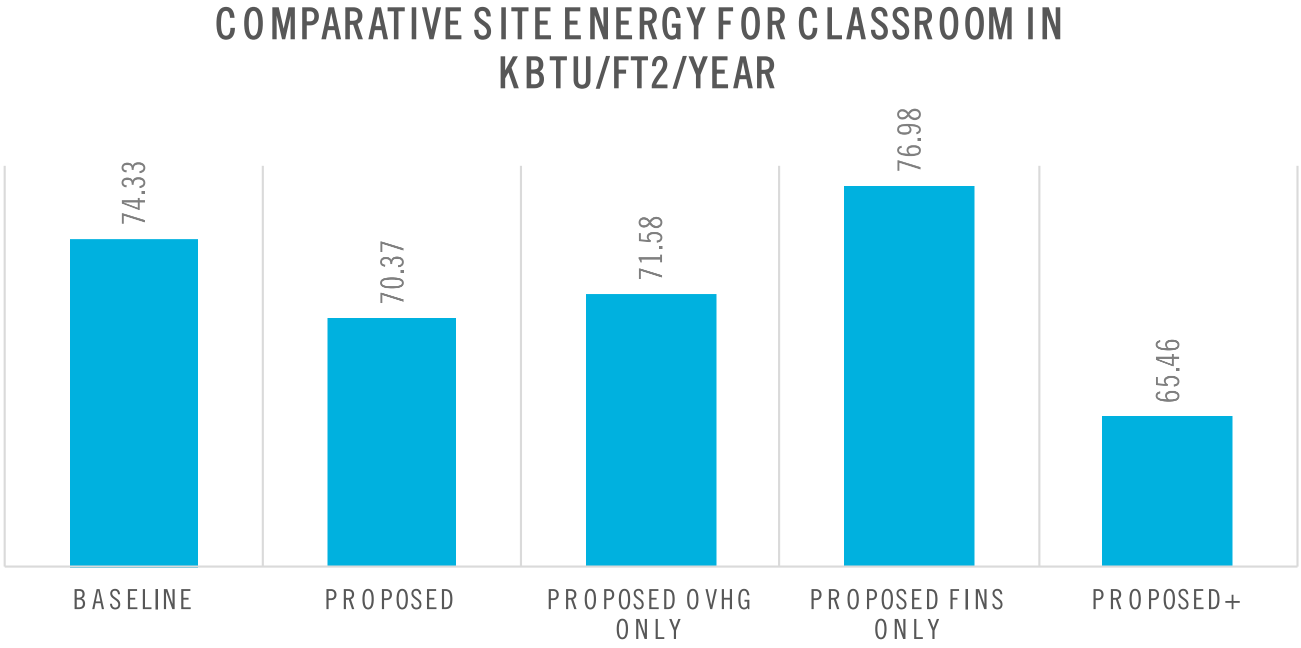
Metal Legacy Medallions

History Timeline

EARLY ENERGY ANALYSIS

ENERGY AND DESIGN PROCESS LAB | TYRONE MARSHALL & MARCELO BERNAL

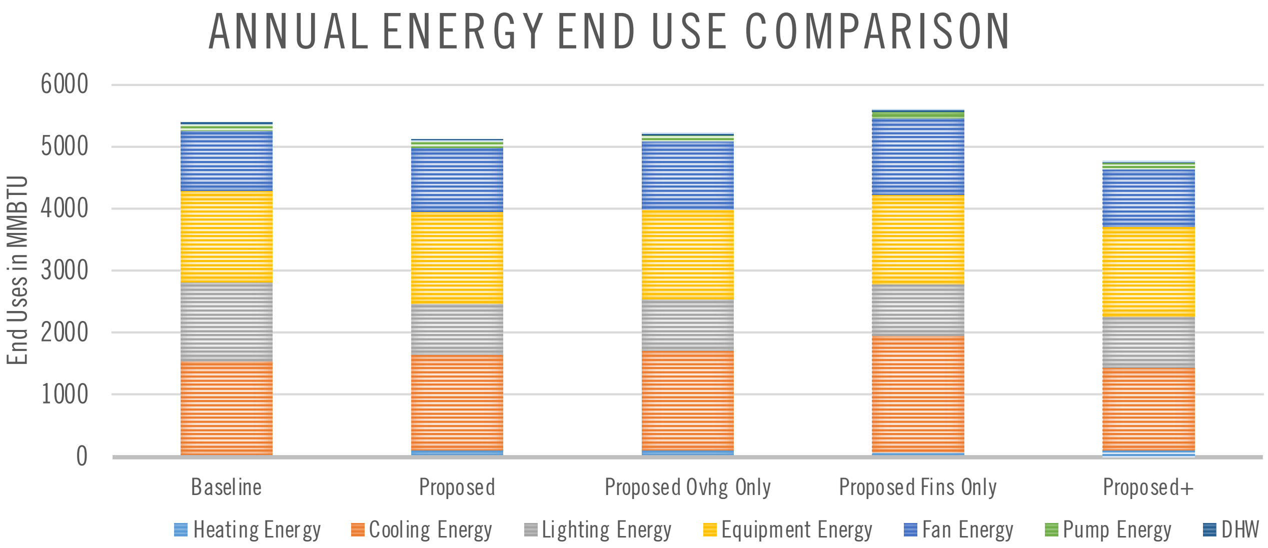
EASTSIDE HIGH SCHOOL
EARLY STAGE ENERGY MODELS FOR CLASSROOMS



Proposed Design Assumptions

- IECC 2015 (Energy Code)
- ASHRAE 90.1-2013 (Energy Code)
- Climate Zone 2A
  - ASHRAE Standard 169-2013
- Architecture 2030 Zero Tool Climate Specific Site Energy 66 kBtu/sf*year Benchmark
- Roof Overhangs N,E,S,W
- Vertical Shading Devices N,E,S,W
- High-performance Cool Roof, Exterior Walls and Glazing Performance
- LED Interior Lighting
- Variable Air Volume with Water Distribution for Heating and Cooling with Room Temperature Control

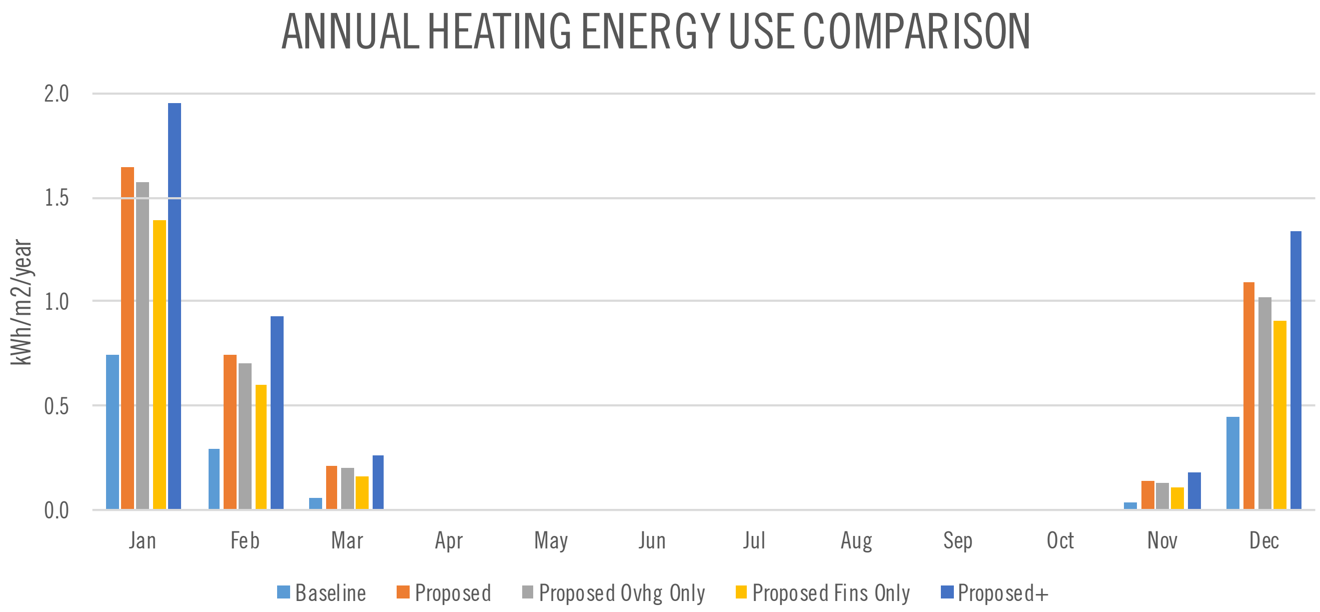
EASTSIDE HIGH SCHOOL
EARLY STAGE ENERGY MODELS FOR CLASSROOMS



Baseline Performance Assumptions

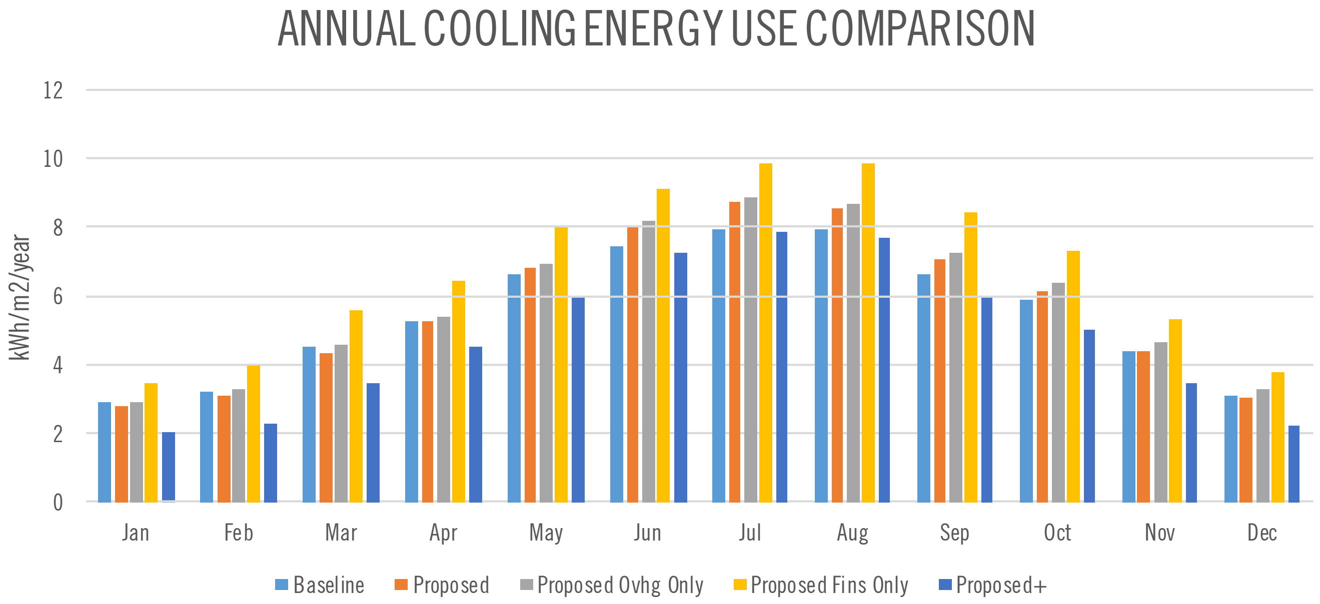
- Baseline Model
  - Average of 4 simulations from 0, 90, 180, and 270 degrees without overhangs, and vertical shading devices, LED interior lighting, standard roof and wall insulation and insulated glazing units.
  - The window to wall ratio for the baseline model uses 22%

EASTSIDE HIGH SCHOOL
EARLY STAGE ENERGY MODELS FOR CLASSROOMS



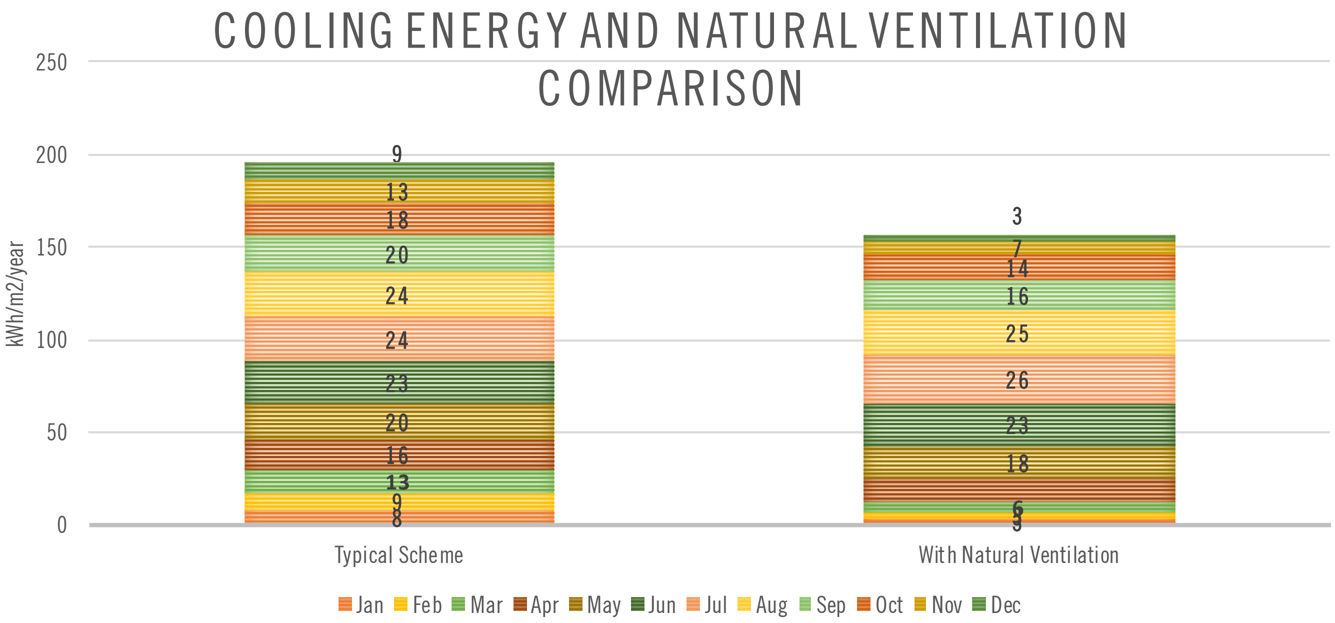
The proposed design uses better insulated glazing units with lower SHGC for East, South, West orientations. The design criteria uses higher insulated steel-framed walls and deeper overhangs on the south and east orientations.

EASTSIDE HIGH SCHOOL
EARLY STAGE ENERGY MODELS FOR CLASSROOMS



The proposed design uses better insulated glazing units with lower SHGC for East, South, West orientations. The design criteria uses higher insulated steel-framed walls and deeper overhangs on the south and east orientations.

EASTSIDE HIGH SCHOOL
EARLY STAGE ENERGY MODELS FOR CLASSROOMS



There is a 20% improvement in lowering cooling energy demand passive design strategies such as natural ventilation with automatic building energy management control of single-sided ventilation flaps, cross ventilation flaps, and wall and roof stack ventilation flaps.

EASTSIDE HIGH SCHOOL
EARLY STAGE ENERGY COST SAVINGS FOR CLASSROOMS

The simple life cycle cost analysis considering the savings from the energy cost between four schemes uses up to a 50-year utility price escalation without consideration for the mechanical system and its maintenance or replacement or the operating and maintenance annual costs or the first costs for the project.

Energy Cost Savings Comparison	Utility Cost $	Annual Energy Cost Savings	Payback Years
Proposed	88,769	4,995	None; 32 Years
Baseline	93,764		
Cost of Borrowing Money	8%		
Life Cycle Cost Comparison	Utility Cost $	Annual Energy Cost Savings	Payback Years
Proposed	88,769	1,524	None more than 50 years
Proposed with Overhangs Only	90,293		
Cost of Borrowing Money	8%		
Life Cycle Cost Comparison	Utility Cost $	Annual Energy Cost Savings	Payback Years
Proposed +	82,574	(11,191)	Yes, 18 year
Baseline	93,764		
Cost of Borrowing Money	8%		

When we look at the utility savings for the baseline, proposed design, proposed design with overhangs only, and then a version of the proposed with better performance (proposed+) the following combination of monthly costs from electric and gas demand from the classroom building area for the three levels shows the following annual utility cost per area:

- baseline: $1.30/sf
- proposed: $1.23/sf
- proposed with overhangs only: $1.25/sf
- proposed+: $1.14/sf

EASTSIDE HIGH SCHOOL
RECOMMENDATIONS

Next steps

The project will use computational design models and sensitivity analysis for more precision for determination of overhangs depth per orientation and the impact on cooling energy and daylighting for best range.

ENVELOPE PARAMETRIC ANALYSIS

ENERGY AND DESIGN PROCESS LAB | MARCELO BERNAL & TYRONE MARSHALL

EASTSIDE HIGH SCHOOL DESIGN SPACE
INTRODUCTION

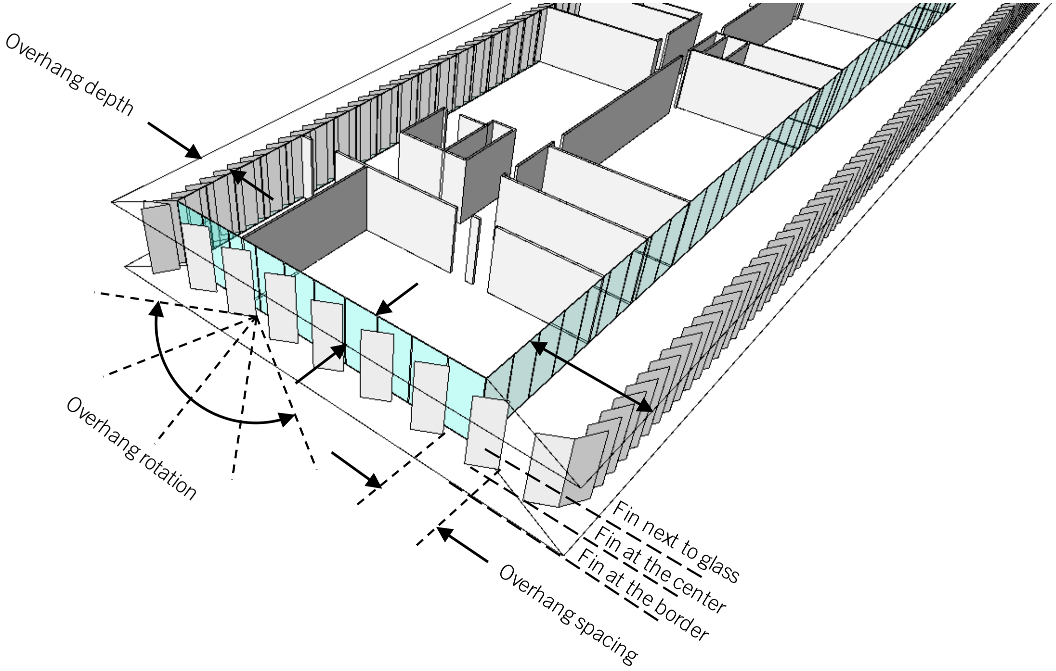
The objective of this study is to Maximize Daylighting within the comfortable range and Minimize Site Energy. For this purpose, this study defines a Design Space of 8,100,000,000 possible combinations of overhangs and vertical Fins. The parameters to explore include Overhangs' depth and Fins' position, spacing and rotation per orientation. To study the impact of these inputs, 64 samples that statistically represent the diversity of the design space have been analyzed.

This initial study assigns constant values for the building envelope to isolate the impact of the overhangs and fins. The results show:

- The Illuminance scores the 64 samples within, above and below the range (300 – 3000 lux) based on the average of the four worst case scenarios recommended by LEED v4 (March and September 21st at 9:AM and 3 PM).
- The Site Energy reduction
- The level of impact of the input parameters
- Recommendation of the input parameters ranges

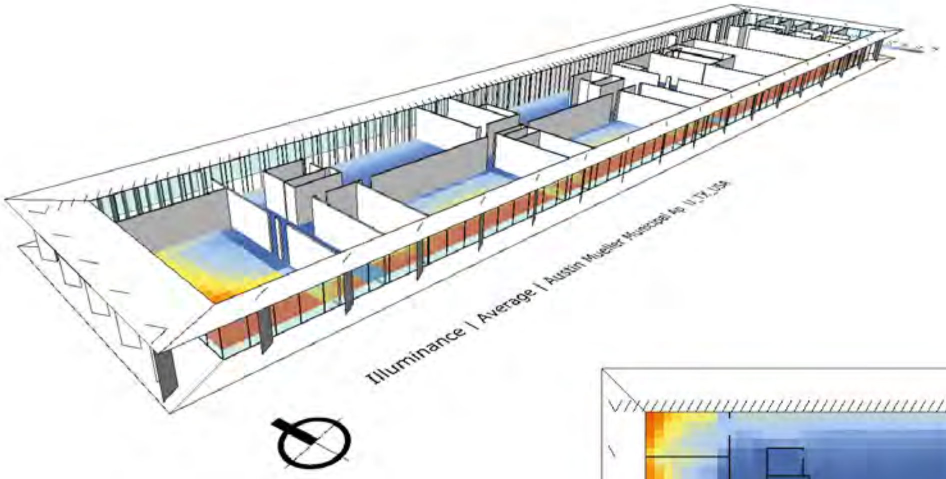
DESIGN SPACE
8,100,000,000 POSSIBLE COMBINATIONS

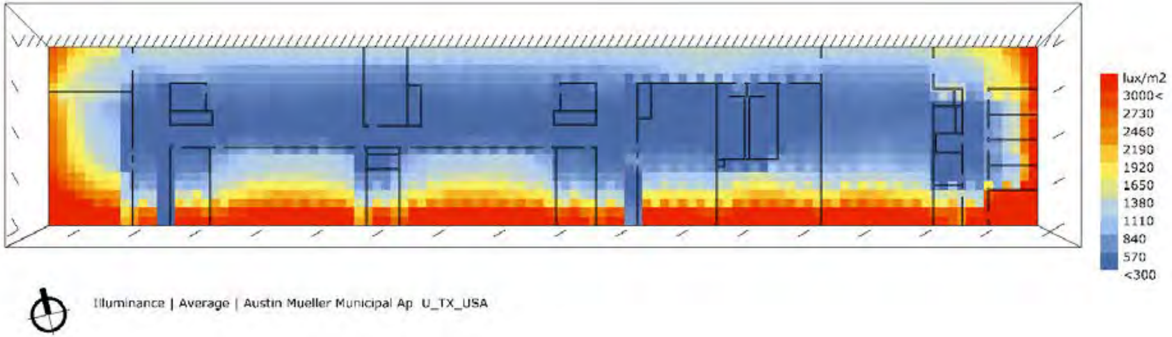
inputs	steps	total
Overhang depth N (ft)	4, 8, 12, 16, 20	5
Overhang depth W (ft)	4, 8, 12, 16, 20	5
Overhang depth S (ft)	4, 8, 12, 16, 20	5
Overhang depth E (ft)	4, 8, 12, 16, 20	5
Fin position N	next to glass = 0, center = 1, border =2	3
Fin position W	0,1,2	3
Fin position S	0,1,2	3
Fin position E	0,1,2	3
Fin spacing N (ft)	1, 3, 5, 7	4
Fin spacing W (ft)	1, 3, 5, 7	4
Fin spacing S (ft)	1, 3, 5, 7	4
Fin spacing E (ft)	1, 3, 5, 7	4
Fin rotation N (degrees)	-60, -30, 0, 30, 60	5
Fin rotation W (degrees)	-60, -30, 0, 30, 60	5
Fin rotation S (degrees)	-60, -30, 0, 30, 60	5
Fin rotation E (degrees)	-60, -30, 0, 30, 60	5



FULL FACTORIAL SPACE OF ALL POSSIBLE COMBINATIONS

DESIGN SPACE
64 RANDOM COMBINATIONS OF OVERHANGS & FINS

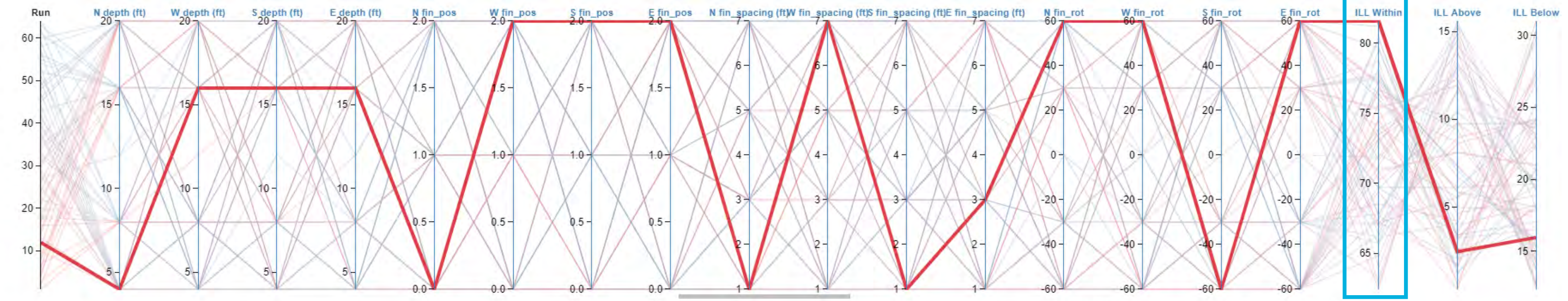




IMPACT ON THE AREA WITHIN THE ILLUMINANCE COMFORTABLE RANGE (300 - 3000 LUX)

ILLUMINANCE

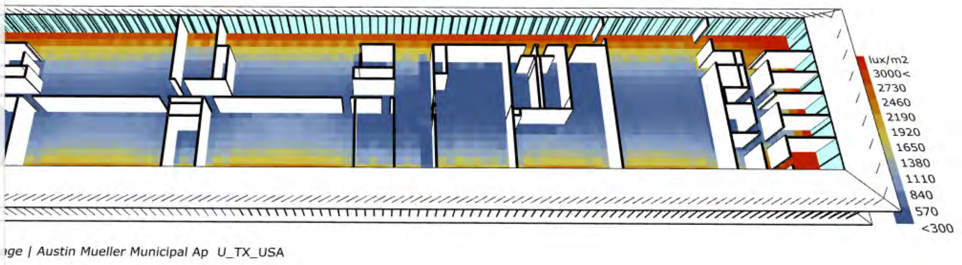
% OF AREA WITHIN THE RANGE OF 300-3000 LUX



Attributes

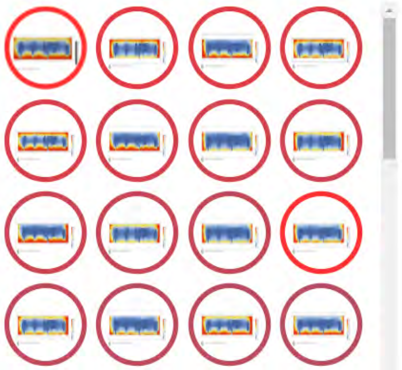
Run : 12
N depth (ft) : 4
W depth (ft) : 16
S depth (ft) : 16
E depth (ft) : 16
N fin_pos : 0
W fin_pos : 2
S fin_pos : 2
E fin_pos : 2
N fin_spacing (ft) : 1
W fin_spacing (ft) : 7
S fin_spacing (ft) : 1
E fin_spacing (ft) : 3
N fin_rot : 60
W fin_rot : 60
S fin_rot : -60
E fin_rot : 60
fin_depth : 1.5
ILL Within : 81.590909
ILL Above : 2.454545
ILL Below : 15.954545
Rating : 0

BEST SCORE: 81.6%



2D 3D

Sort by: Run



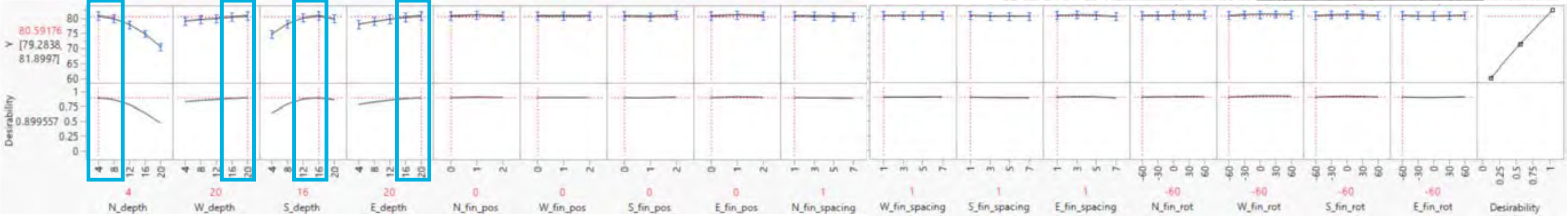
EXPLORE AT HTTP://TT-ACM.GITHUB.IO/DESIGNEXPLORER/?ID=ECSGJW

ILLUMINANCE
SENSITIVITY ANALYSIS

inputs	recommendation	impact
Overhang N (ft)	4 – 8	HIGH
Overhang W (ft)	16 – 20	HIGH
Overhang S (ft)	12 – 16	HIGH
Overhang E (ft)	16 – 20	HIGH
Fin position N (next to glass, center, border overhang)	Free	LOW
Fin position W	Free	LOW
Fin position S	Free	LOW
Fin position E	Free	LOW
Fin spacing N (ft)	1 - 3	LOW
Fin spacing W (ft)	1 - 3	LOW
Fin spacing S (ft)	1 - 3	LOW
Fin spacing E (ft)	1 - 5	LOW
Fin rotation N (degrees)	Free	LOW
Fin rotation W (degrees)	-30 to 30	LOW
Fin rotation S (degrees)	-30 to 30	LOW
Fin rotation E (degrees)	Free	LOW

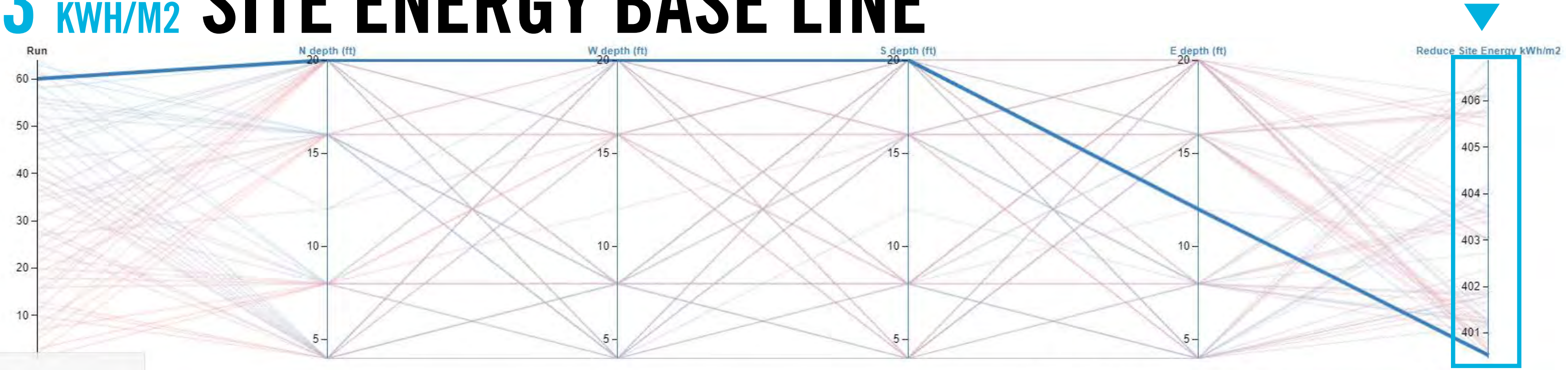
*Fin constant depth of 1'6"

Source	LogWorth	PValue
N_depth(4,20)	26.737	0.00000
S_depth(4,20)	17.956	0.00000
S_depth*S_depth	10.894	0.00000
E_depth(4,20)	10.740	0.00000
N_depth*N_depth	8.937	0.00000
W_depth(4,20)	5.841	0.00000
E_fin_spacing*E_fin_spacing	0.841	0.14429
E_depth*E_depth	0.669	0.21444
W_fin_rot(-60,60)	0.655	0.22129
E_fin_pos*E_fin_pos	0.637	0.23053
S_fin_rot*S_fin_rot	0.563	0.27336
E_fin_spacing(1,7)	0.540	0.28807 ^
W_fin_rot*W_fin_rot	0.505	0.31296
S_fin_pos*S_fin_pos	0.504	0.31366
N_fin_pos*N_fin_pos	0.470	0.33877
N_fin_spacing(1,7)	0.454	0.35171
N_fin_rot(-60,60)	0.430	0.37148
S_fin_pos(0,2)	0.398	0.39964 ^
S_fin_spacing(1,7)	0.338	0.45894
E_fin_rot*E_fin_rot	0.274	0.53272
S_fin_spacing*S_fin_spacing	0.203	0.62590
E_fin_pos(0,2)	0.179	0.66168 ^
W_fin_spacing(1,7)	0.130	0.74197
E_fin_rot(-60,60)	0.128	0.74494 ^
W_depth*W_depth	0.121	0.75667
W_fin_pos*W_fin_pos	0.099	0.79576
N_fin_spacing*N_fin_spacing	0.076	0.83944
N_fin_pos(0,2)	0.076	0.83954 ^
S_fin_rot(-60,60)	0.064	0.86226 ^
W_fin_spacing*W_fin_spacing	0.060	0.87084
W_fin_pos(0,2)	0.056	0.87895 ^
N_fin_rot*N_fin_rot	0.026	0.94273

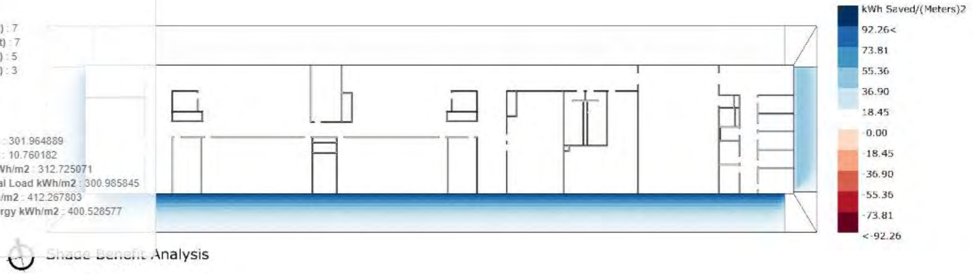


OVERHANGS SHADING BENEFITS

412.3 KWH/M2 SITE ENERGY BASE LINE



BEST SCORE: 400.5 KWH/M2

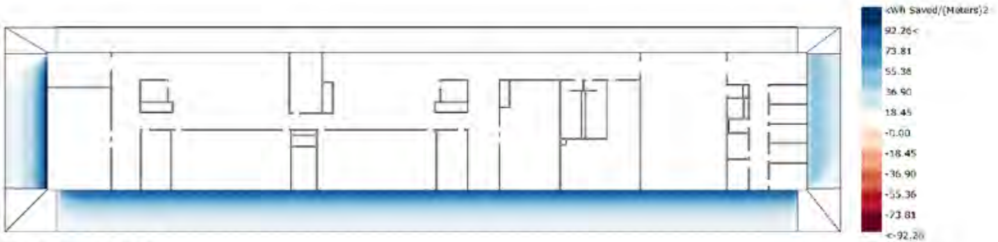


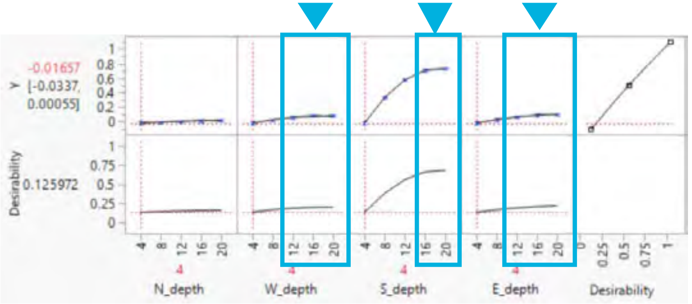
EXPLORE AT HTTP://TT-ACM.GITHUB.IO/DESIGNEXPLORER/?ID=QXSKN9

OVERHANGS SHADING BENEFITS
SENSITIVITY ANALYSIS

inputs	recommendation	impact
Overhang depth N (ft)	free	LOWEST
Overhang depth W (ft)	12 – 20	MEDIUM
Overhang depth S (ft)	16 – 20	HIGHEST
Overhang depth E (ft)	12 – 20	MEDIUM

Source	LogWorth	PValue
S_depth(4,20)	66.498	0.00000
S_depth*S_depth	36.768	0.00000
E_depth(4,20)	24.894	0.00000
W_depth(4,20)	20.358	0.00000
N_depth(4,20)	5.930	0.00000
W_depth*W_depth	4.193	0.00006
E_depth*E_depth	2.869	0.00135
N_depth*N_depth	0.506	0.31174





Shade Benefit Analysis

THE OVERHANG DEPTHS VARIES FROM 4' TO 20'

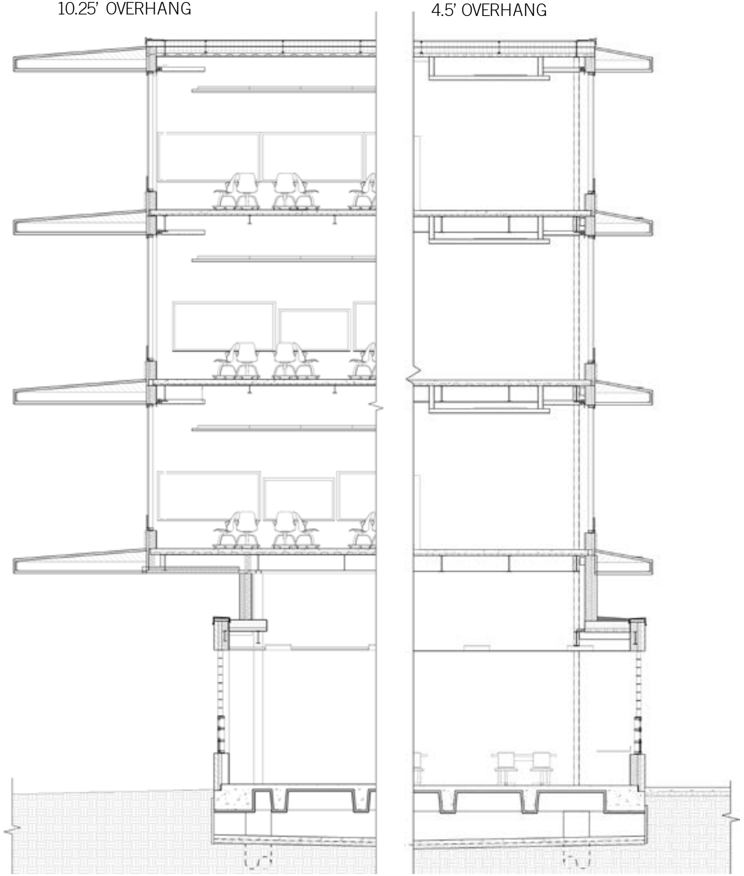
PERKINS+WILL

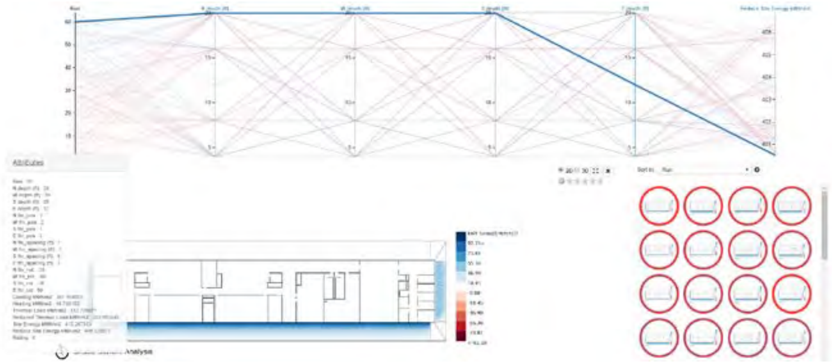
SECTION THROUGH SOUTH SIDE OF CLASSROOM ADDITION

10.25' OVERHANG

SECTION THROUGH NORTH SIDE OF CLASSROOM ADDITION

4.5' OVERHANG





inputs	recommendation	impact
Overhang depth N (ft)	free	LOWEST
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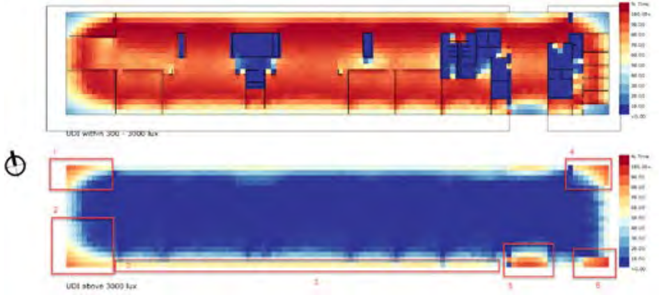
Overhang depth E (ft)	12 – 20	MEDIUM



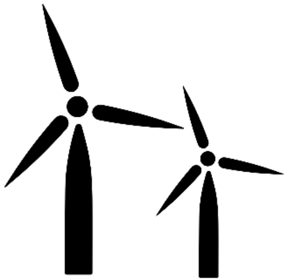
Target: maximize area within (red)

Target: minimize area above range (red)

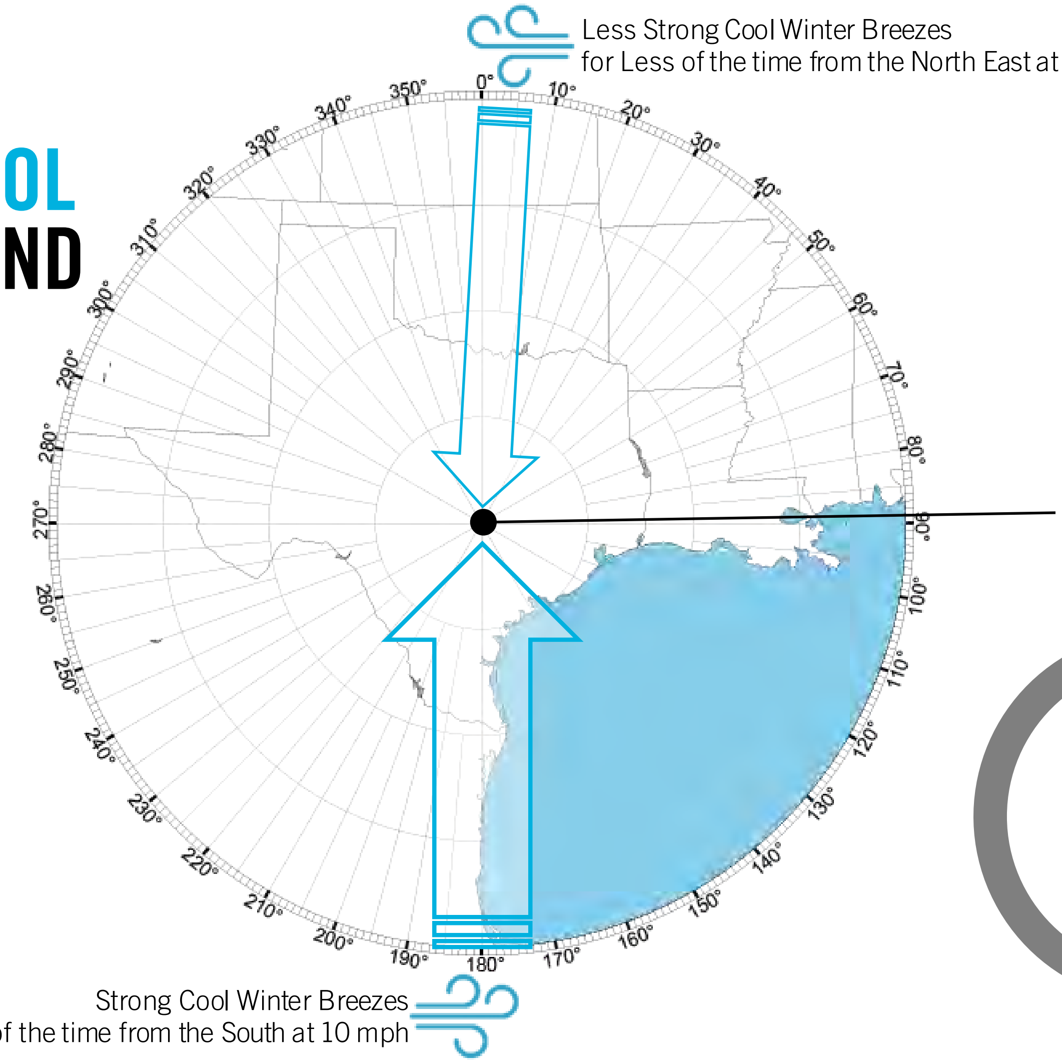
PASSIVE DESIGN STRATEGIES

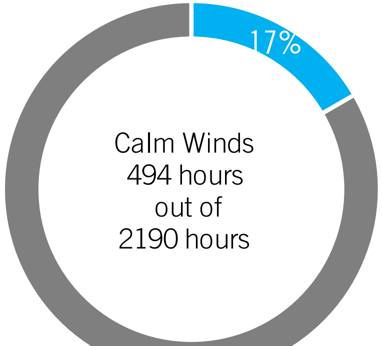
ENERGY AND DESIGN PROCESS LAB | TYRONE MARSHALL & MARCELO BERNAL

EASTSIDE HIGH SCHOOL
WINTER WIND

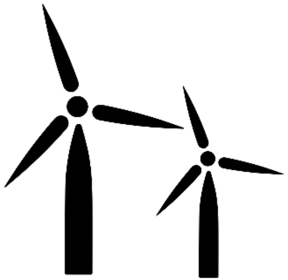


The design strategy for the condition during winter may consider the placement of site and building elements block open areas such as courtyards and shield them from the colder outside air.

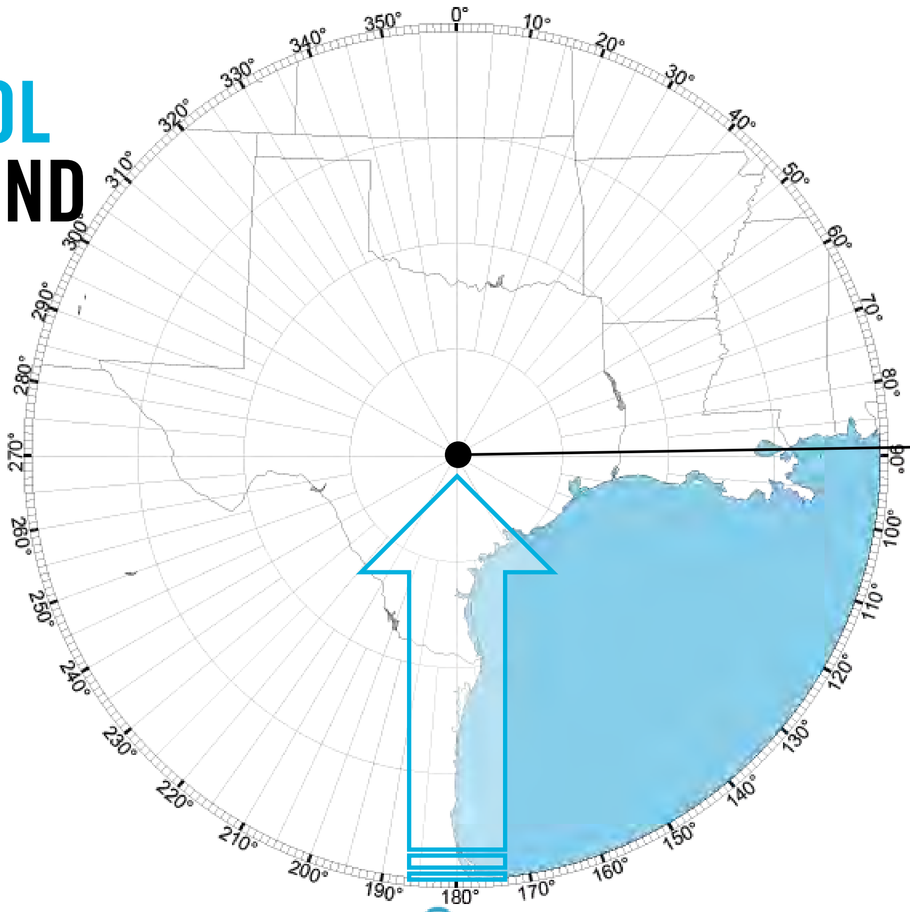




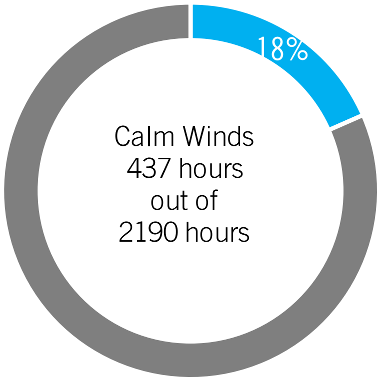
EASTSIDE HIGH SCHOOL SUMMER WIND



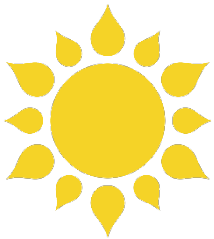
The design strategy for the condition during summer may consider the placement of site and building elements such as courtyards that can capture the breezes for gentle, natural cooling for those exterior spaces.



Strong Summer Breezes from the North at 8 mph



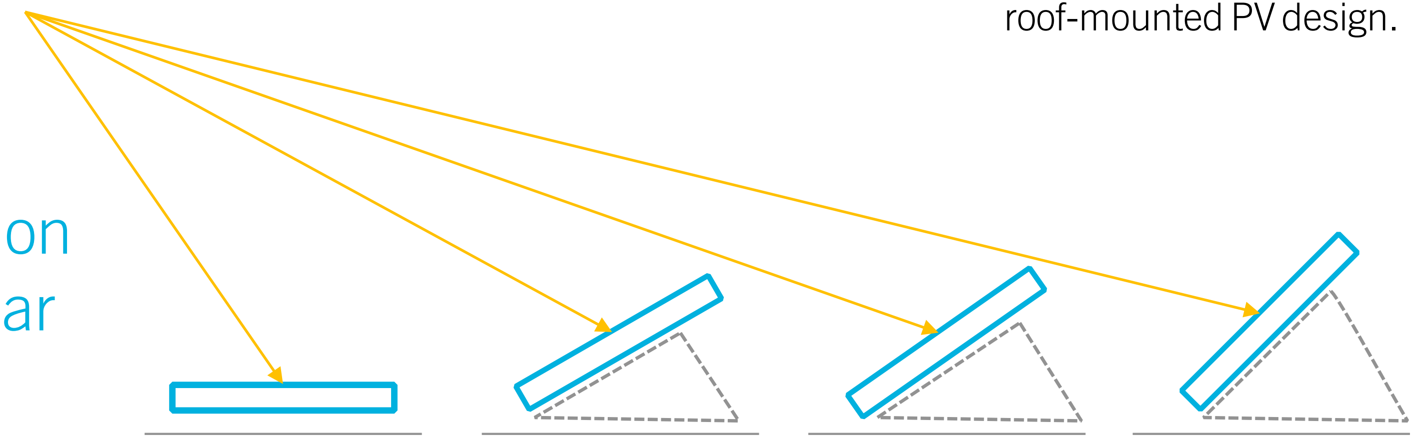
EASTSIDE HIGH SCHOOL
WIND



Energy Generation from Solar

South Orientation
Austin, Texas

The potential for on-site generation of electrical energy from photovoltaics maximizes with tilted collection surfaces that orient toward the equator at 30º to harvest direct beam solar radiation for consideration for building roof-mounted PV design.



1,325 kWh/year

Estimated 1kW DC
PV Potential with 0º Tilt

1,466 kWh/year

Estimated 1kW DC
PV Potential with 30º Tilt

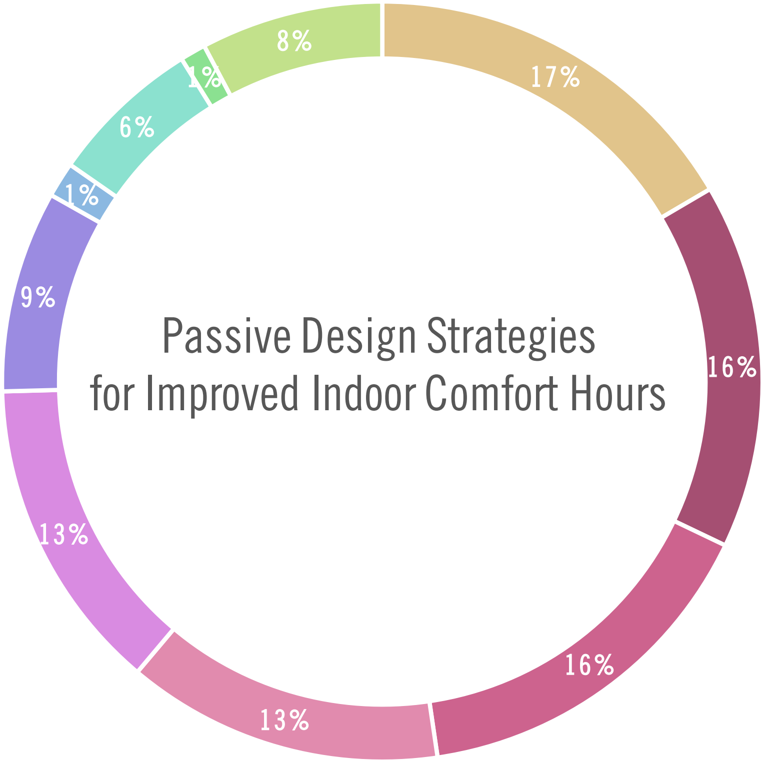
1,460 kWh/year

Estimated 1kW DC
PV Potential with 35º Tilt

1,420 kWh/year

Estimated 1kW DC
PV Potential with 45º Tilt

EASTSIDE HIGH SCHOOL PASSIVE DESIGN STRATEGIES



- Cooling and Dehumidification (Summer, Spring)
- Use Internal Heat Gain from Occupants, Lights, and Equipments (Winter and Spring)
- Sun Shading of Windows (Summer, Fall, Spring)
- Natural Ventilation Cooling (Summer, Fall, Spring)
- Dehumidification (Summer, Spring)
- Heating and Humidification (Winter, Spring)
- Cooling and Dehumidification (Summer, Fall, Spring)
- Windows Overhangs and Thermal Mass Floors and Walls (Summer, Fall, Spring)

Ultra-low energy and high-performance building approach for the building design consider the use of passive design strategies that lower space heating and air-conditioning requirements, lower pump and fan energy use with economizers that further enhance passive cooling by storing and dissipating internal heat gain in the summer to the outdoor air.

SUSTAINABLE PERFORMANCE - ARCHITECTURE

data pulled from SPR, tab 6

Meets AIA 2030 Commitment

Conducted Precautionary List Review

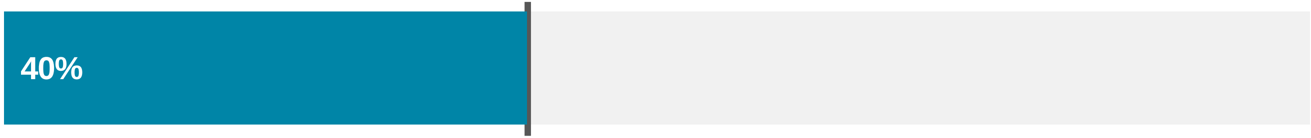
Meets Sustainable Design Commitment for Water

Building Energy Use Reduction

Baseline EUI: 51.3

GOAL
(70% REDUCTION FROM 2030 AIA BASELINE)

Fixtures - Potable Water Reduction



GOAL
(40% REDUCTION FROM CODE)

LEED

Third Party Certifications (Registered or Certified)

NEXT STEPS

NEXT STEPS

- Abatement and Selective Demo
  - -Fall/Winter 2018-2019
- Continued CAT Meetings
- Groundbreaking
  - -January 19, 2019
- Design Completion
  - -May 2019
- Construction Completion
  - -Summer 2021