Have YOU ever thought-

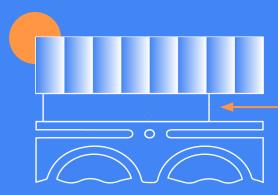
"Man I wish there were MORE co-working spaces?"

"Maybe something like WeWork, but marginally better?"

"Perhaps I'd like to work next to a canal?"

Canal Coworking

Innovation in the Desert

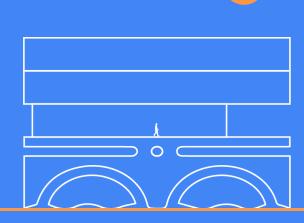


SITE



OVERVIEW

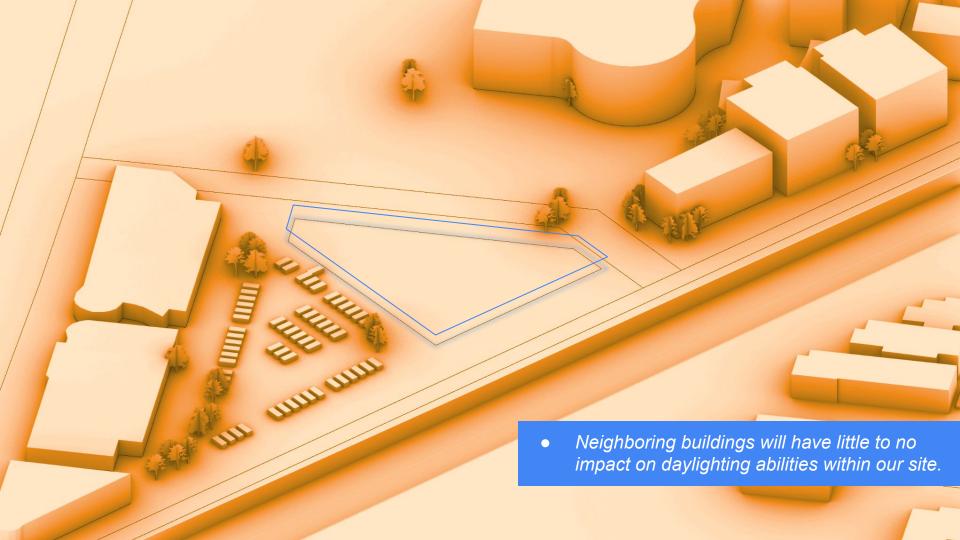
- Project and site targets
- Project Targets
- Massing Development
- Daylighting Design
- Building Design
- Electric Design
- Environmental Performance







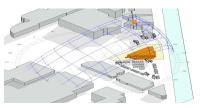




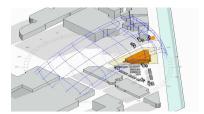




Shading Analysis



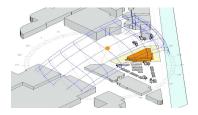
Jun 15, 7.00 a.m



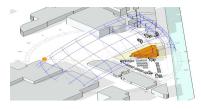
Sept 22, 7.00 a.m



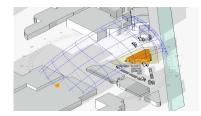
Jun 15, 12.30 p.m



Sept 22,12.30 p.m



Jun 15, 17.00 p.m



Sept 22, 17.00 p.m

- On average, there are 299 sunny days per year in Scottsdale. The US average is 205 sunny days.
 Scottsdale gets some kind of precipitation, on average, 38 days per year. Our site resides with several 2 story buildings, allowing it to stand proud at 9.9 meters tall, basking in constant sun rays.
- It does not fall in the shade of any of the surrounding buildings as they are all low lying with the tallest building in close proximity at 10m. Our building is 9.9m tall.

References



TARGETS

3 things we want to use



Solar Radiation

As mentioned previously, Arizona has a high solar potential. We plan to take advantage of this
by implementing passive and active solar strategies into our office building.



Humidity

• Arizona's Climate is extremely dry and has lower humidity values. Because of this, our building system can use less energy in the heating and cooling of air processes

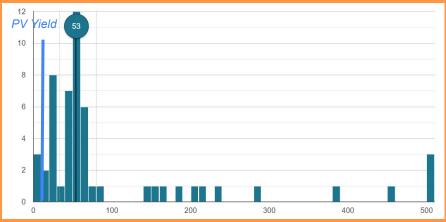


Thermal Massing

• The desert lends itself to high temperatures during the day and low temperatures at night. Introducing a high thermal mass will aid in passive solar design, creating a lag in temperature changes throughout the day ensuring comfort and in the process, moderating the high temperature during the day and low temperatures at night.

Solar PV Potential / PV Yield

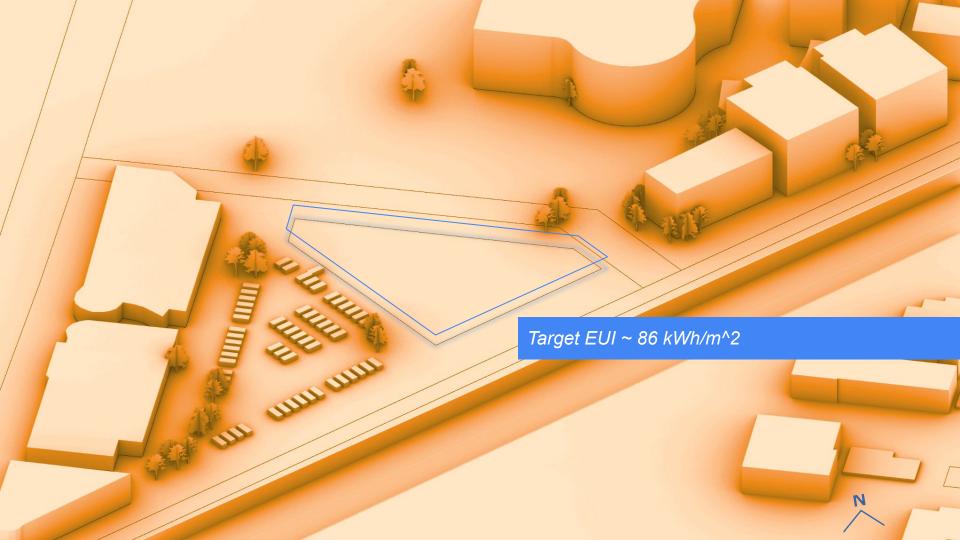




SITE EUI(KBTU/FT^2)

Solar PV Potential. The annual electricity use of the solar panels in the figure above is: $184 \times 1.5 \text{m}^2 \times 2252 \text{ kWh/m}^2\text{-yr} \times 0.18 \times 0.96 = 107,404.19 \text{ kWh}$

The Electricity yield of the PV system is 107,404.19 kWh, Assuming 2500 m² floor area, the PV system can support an EUI of 107,404.19 kWh/2500m² = 42.96 kWh/m². To convert the histogram to KBTU/ft, the resulting number is EUIPV= 42.96 kWh/m²*0.317 kBTU/ft² = 13.62 kbtu/ft²



MASSING+ DAYLIGHTING availability

Initial Massing Studies

sDA = 100%

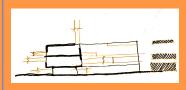


Iteration 2 - Atrium sDA = 100%ASE = 65.7%



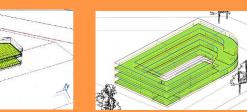
sDA = 100%ASE = 43%



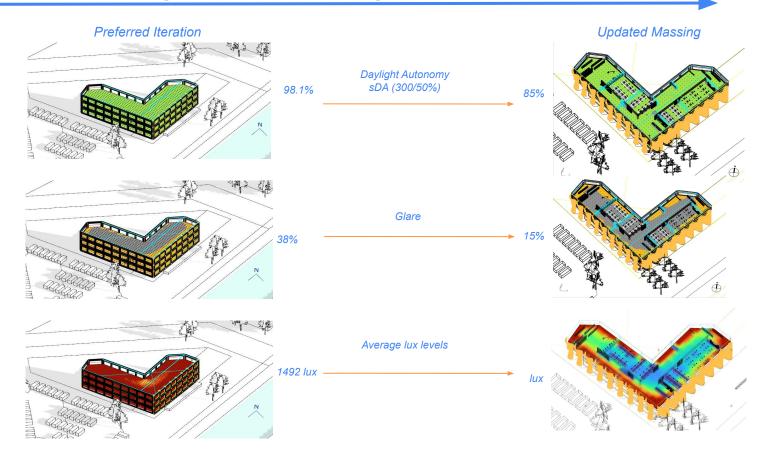


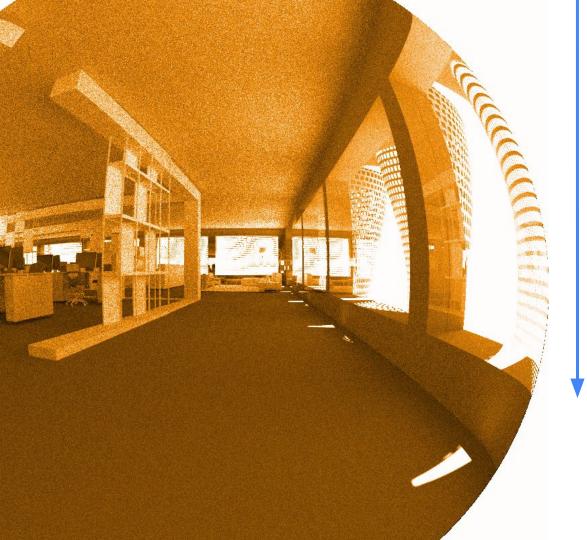






Updated Daylight Analysis



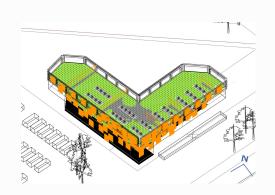


Hallmarks of a good Coworking space

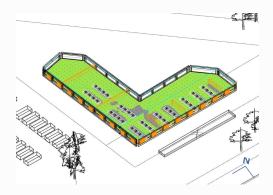
- Sufficient lighting
- Variety of working conditions
- Comfort as the ability to modify one's surroundings
- Visual contact with outside

DAYLIGHTING shading

Initial Facade Studies



Iteration 1
Panelized sunscreen
sDA = 81.5%
ASE = 18.5%



Iteration 2 Brick sunscreen sDA = 81.5% ASE = 18.5%

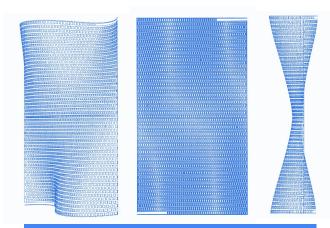


Iteration 3
Brick sunscreen with light shelf
sDA = 68.9%
ASE = 12.9%

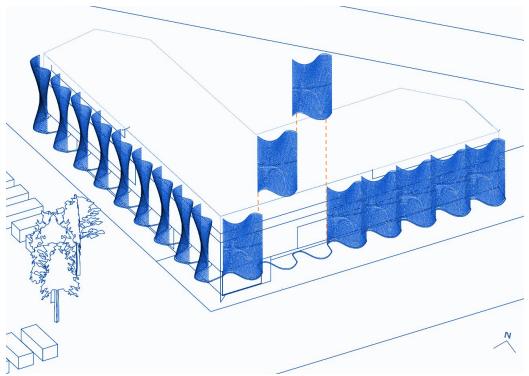
Optimizations

- Horizontal shading (Light Shelf)
- Furniture and dividing walls, limiting how far into the facade light travels

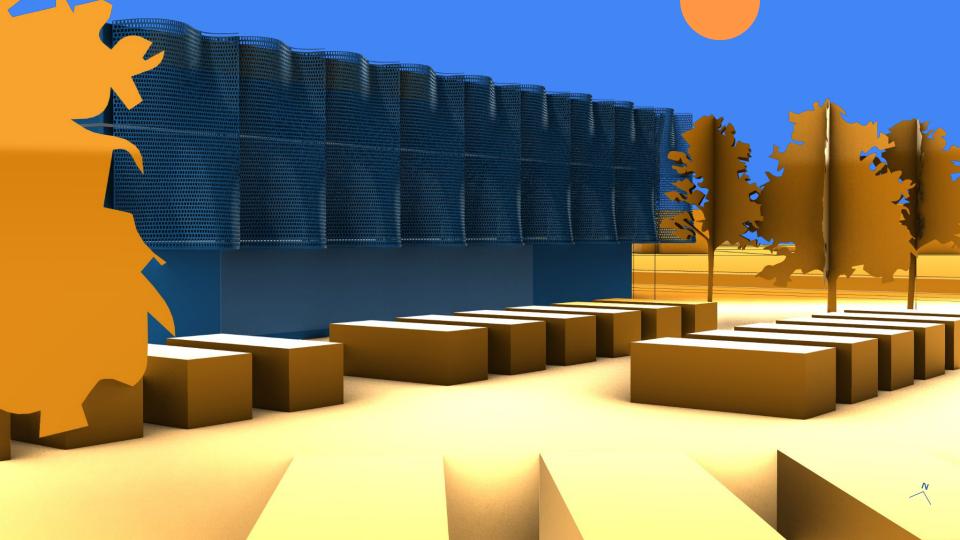
Facade Module



- Perforated Metal Panels offset from the glazing of the facade
- Undulations allow for dynamic views out to the city
- Direct glare is mitigated while ensuring that daylighting needs of 300lux min. are met
- Act as a brise soleil for ventilation

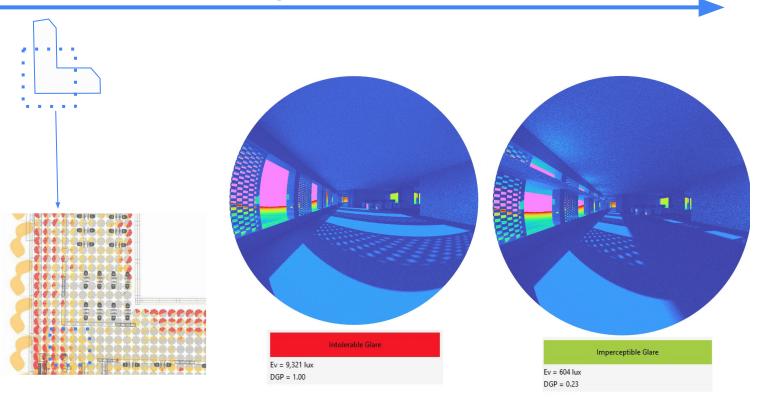




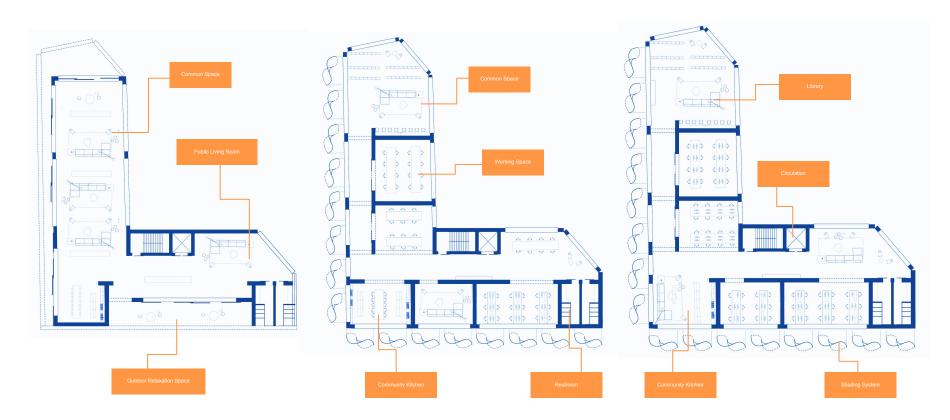


DAYLIGHTING glare

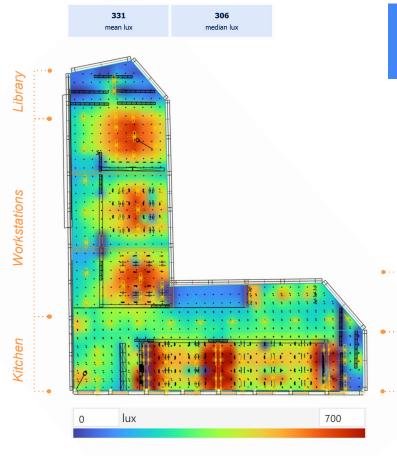
Glare Analysis



PLANS + PROGRAM



LIGHTING



- 331 mean lux + 306 Median Lux: This is a scenario in which all the lights available are switched on. The design of the controls including dimming and multiple switches will allow the lighting lux levels to be adjusted and reduced to optimum levels of about 300 lux
- $LPW = 75 \times (52.75W/344.9m2) = 11.5W/m2$



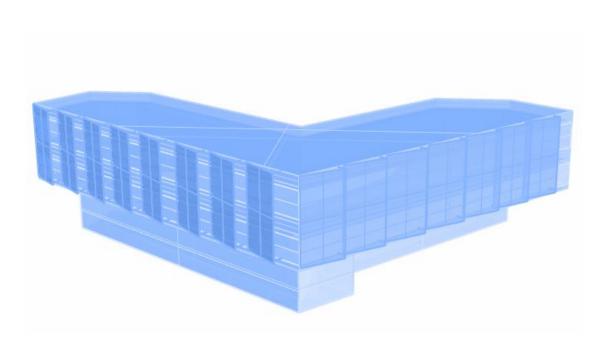
- Lounge Area & Circulation
- Work Stations

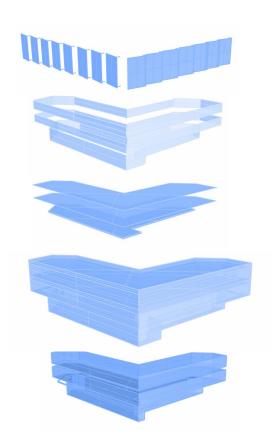
- The floors of Canal Coworking are divided up into a mixture of workstations, common areas and interstitial spaces that allow for fluid transitions and flows of people. We've focused on the second floor west section for this lighting study.
- The luminaires and designed the lighting layout to be didactic in suggesting the use of the different spaces. From more focused lighting using the Eyeline suspended luminaire over the workstations, to more sparse and diffused lighting using the Eyeline wall fitting in the social spaces.
- The variation in lux levels gives the worker diversity of vision that directly addresses the uniform light intensity of offices that leads to fatigue and low productivity.
- A more nuanced design of the lighting controls allowing for dimming will give even more flexibility.



that uses visual difference and in turn choice, to achieve comfort. Washes of light on walls and partitions using the wall mounted Signify Ledalite Eyeline luminater transforms them into visually interesting objects with potential for display whilst the linear Signify suspended Eyeline fitting has been positioned over each of the workstations. Users have the option of moving across the floor plan to a location with a lighting intensity that best matches their needs. The upward component in section of the luminaires we chose, coupled with a ceiling with a reflectance value of 70%, provides diffuse lighting effects that reduces glare on the workstations.

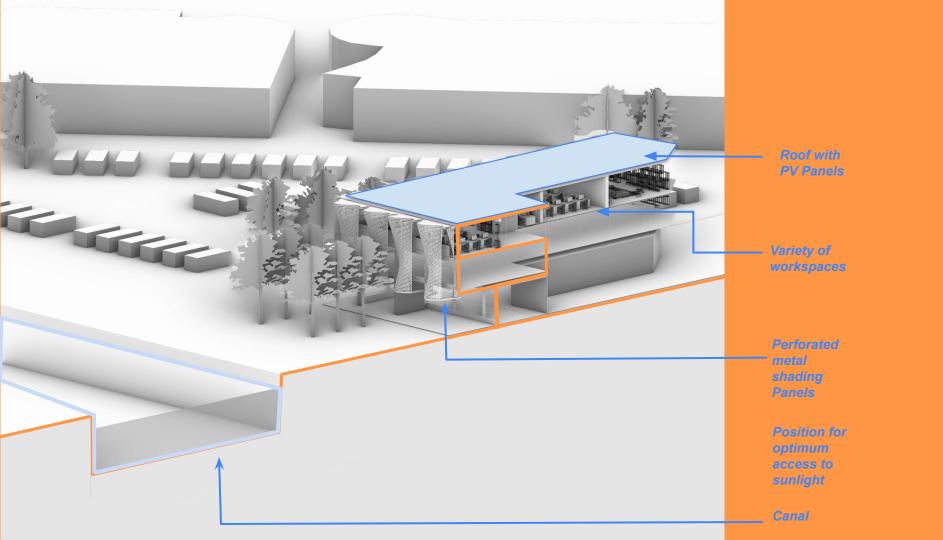
THERMAL MASSING MODEL

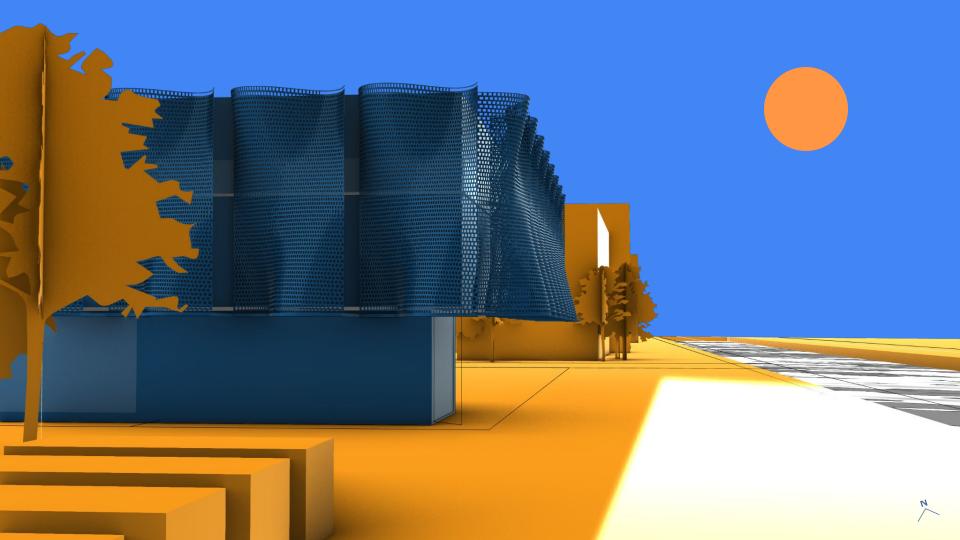


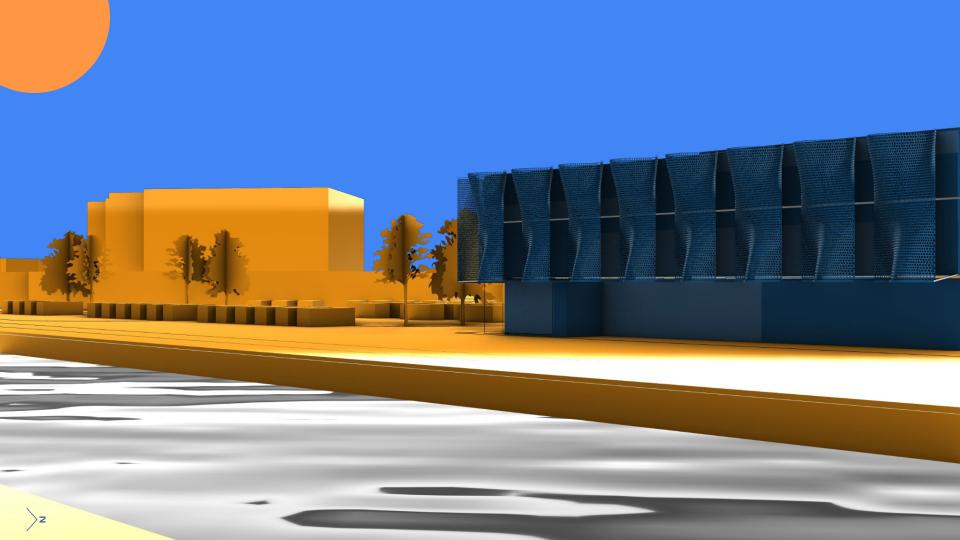


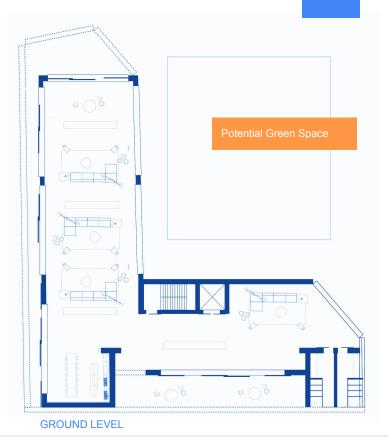


FINAL DESIGN

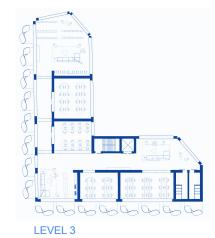












LEVEL 2

space!

The program lends itself to a variety of working styles... for those who work hard, and those who play hard. Now that's my kind of co-working

The Canal

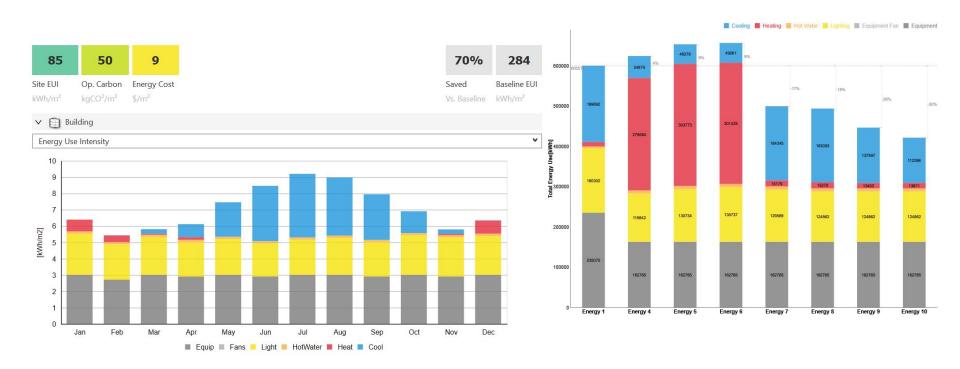
ENVIRONMENTAL PERFORMANCE

Buildina System Settinas Discussion

Thermal Zone Settings

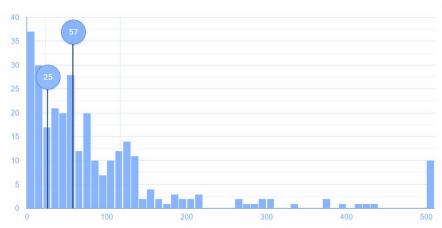
- The occupant peak load is 0.102
- Based on 216 people/ 2110/sqm
- People Density set to 0.102
- Metabolic Rate set to 1.2
- Schedule set to Weekdays+Weekends 8AM-5PM
 - Schedule set to Weekdays+Weekends 8AM-5PM
- Equipment Power Density set to 10.76
- Lighting Power Density set to 10.76
- Schedule set to Default
- 300 Illuminance Lux with Stepped Dimming
- Nighttime Ventilation and cooling to take advantage of desert nighttime cooling
- Building fabric- standard for 2A

FINAL EUI - 85



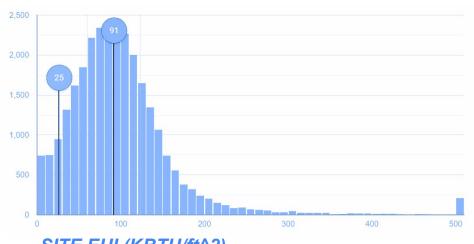
BENCHMARKING

Buildings in Arizona

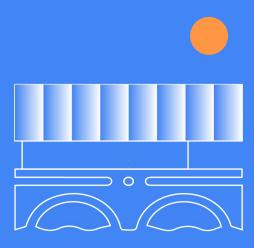


SITE EUI (KBTU/ft^2)

Buildings in the U.S.



SITE EUI (KBTU/ft^2)



Thank You.