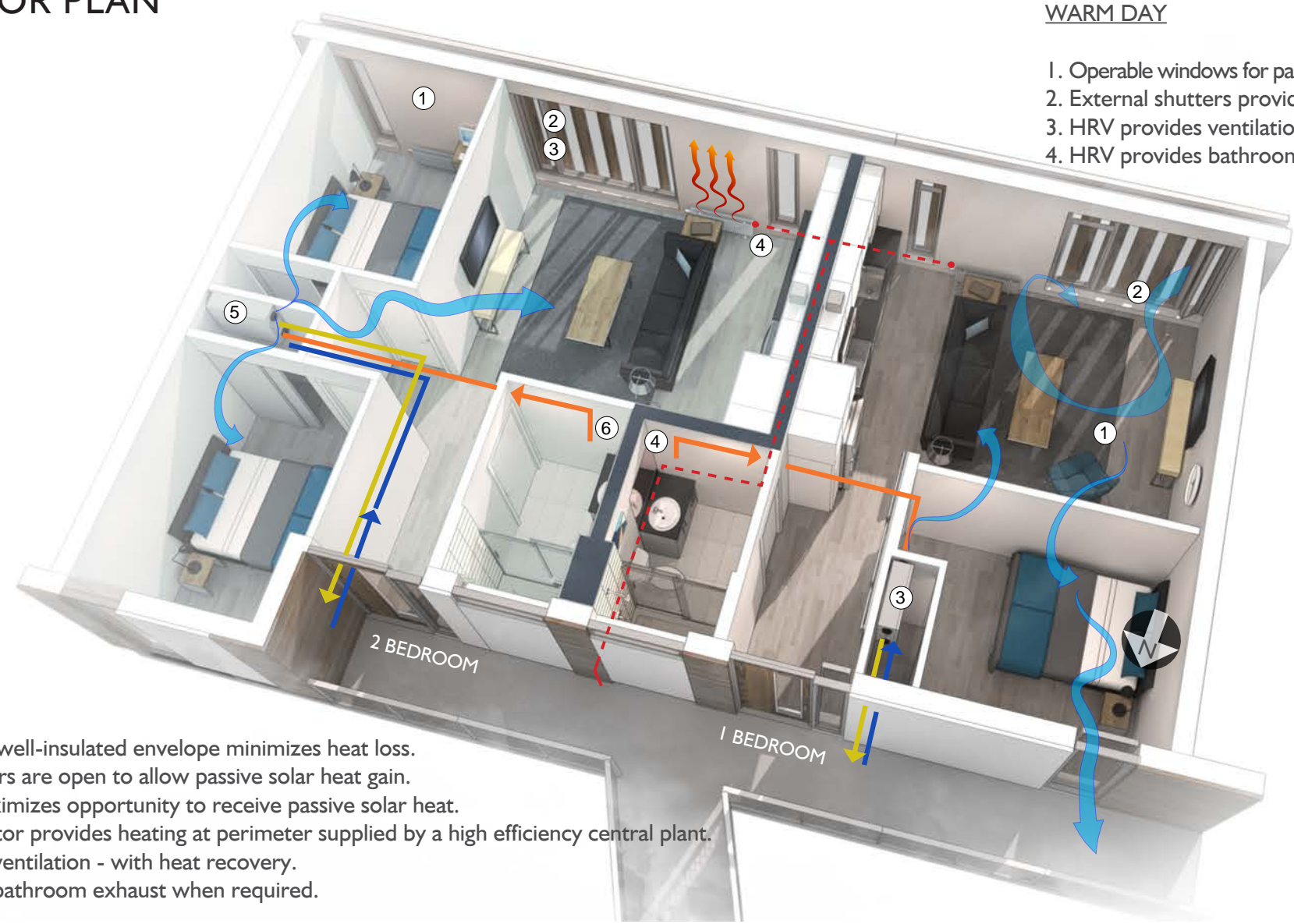


UNIT FLOOR PLAN

WARM DAY

1. Operable windows for passive cooling.
2. External shutters provide users control over solar heat gain and glare.
3. HRV provides ventilation when necessary (CO2 control) - no heat recovery.
4. HRV provides bathroom exhaust when required.



COLD DAY

1. Tightly sealed, well-insulated envelope minimizes heat loss.
2. External shutters are open to allow passive solar heat gain.
3. Clear glass maximizes opportunity to receive passive solar heat.
4. Hydronic radiator provides heating at perimeter supplied by a high efficiency central plant.
5. HRV provides ventilation - with heat recovery.
6. HRV provides bathroom exhaust when required.

- Exhaust air
- Exhaust air - heat recovered
- Outdoor air
- Tempered fresh air
- Hot water piping

CONSPICUOUS CONSUMPTION:

Human behavior is the next frontier of energy efficiency in large scale net-zero housing. Design that empowers occupants to measure and manage their energy consumption can have a significant impact on overall building energy use.

Well-sited and programmed, the three buildings favor an east-west orientation around covered open-air courts. These outdoor spaces give residents a connection to the weather, encourage interaction, and eliminate common area conditioning and ventilation. The envelope is tightly sealed and well-insulated, and thermal bridging is minimized. External vertical shutters are opened during cool weather to take advantage of passive solar heat gains, and are closed during warmer weather, providing resident engagement and control while eliminating the need for a cooling system.

Electricity is generated through photovoltaics, and hot water and space heating through a ground-source heat pump. The PV arrays overhang the building to maximize the electricity budget, while individual panels are selectively transparent to bring dappled daylight into the central courts.

A budget for net-zero energy is tracked and displayed in real time. At an individual level, a smart phone app aids in tracking; at a building level, dynamic color LED lighting highlights the top performing floors; and at a campus level the three buildings' relative performance is displayed, encouraging competition and conversation. As a result, students and their families actively manage their energy with continual feedback. They carry these learned patterns to their post-academic life, setting the stage for net zero in communities beyond the UCSF Mission Bay campus.



SOUTH PERSPECTIVE VIEW

END USE ENERGY = 12.1 EUI

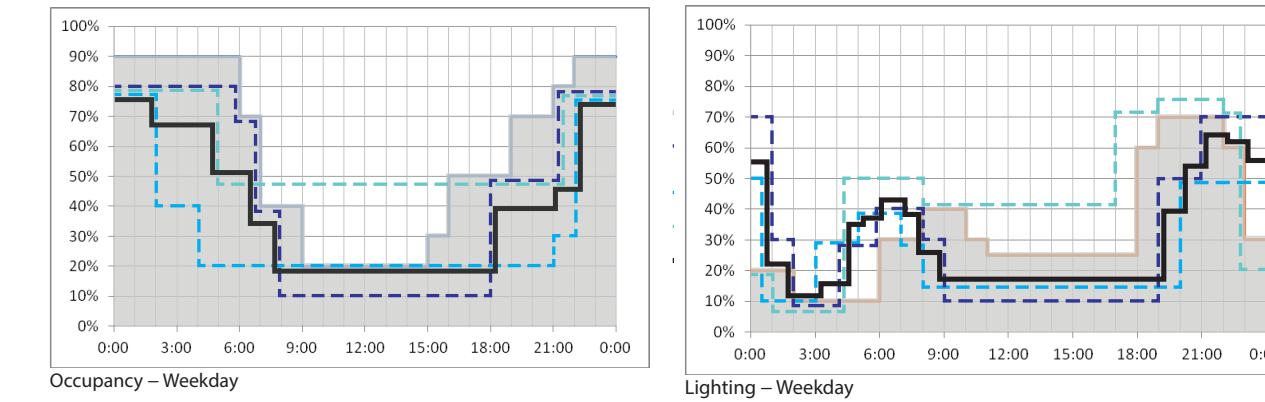
12.4 EUI = SITE RENEWABLE ENERGY



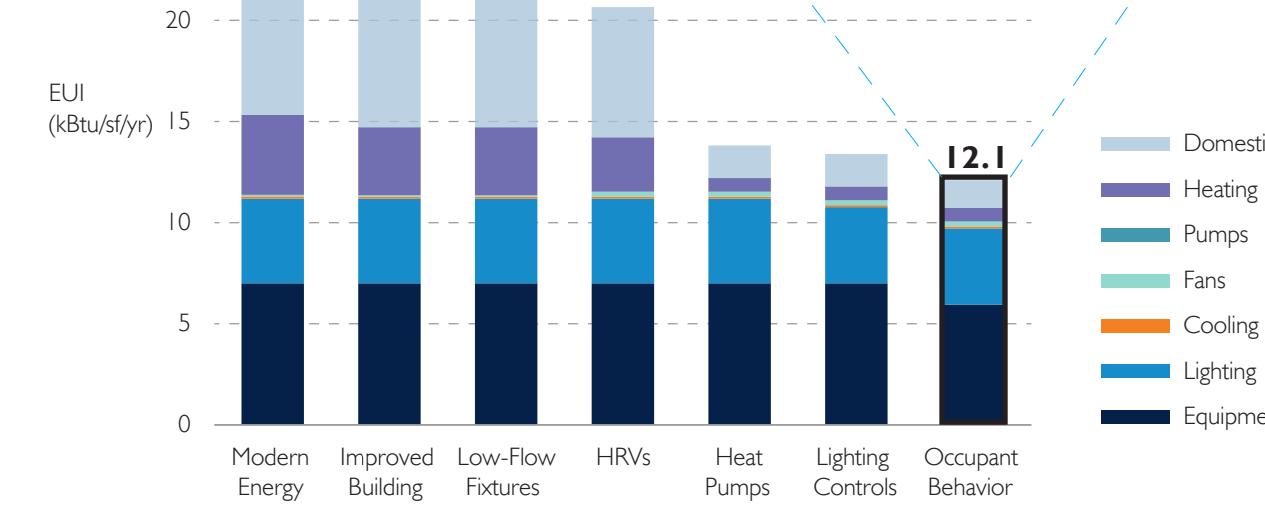
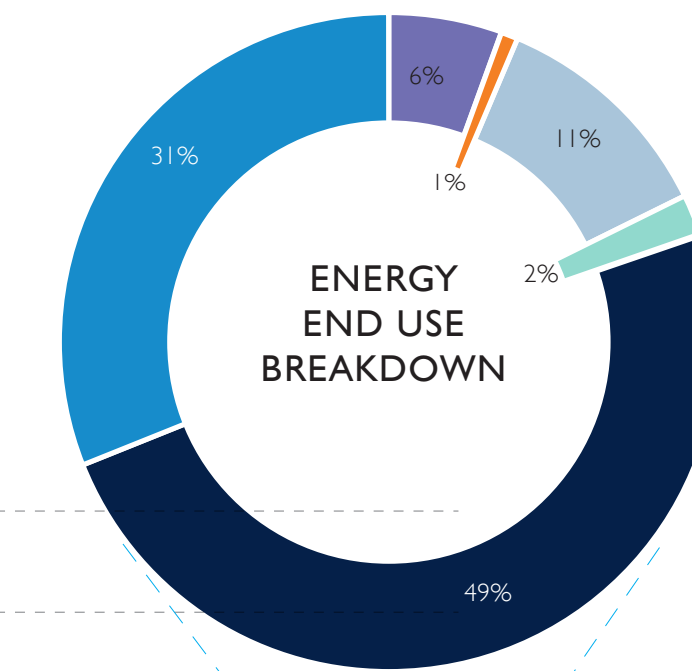
SECTION PERSPECTIVE VIEW

- A** THE THREE HIGHEST ENERGY PERFORMING FLOORS OF EACH BUILDING ARE RANKED AND HIGHLIGHTED BY LED LIGHTS WITHIN THE COURTYARD WALKWAYS TO ENCOURAGE COMMUNITY ENERGY CONSERVATION.
- B** A DYNAMIC AND OPEN COURTYARD ENCOURAGES COMMUNITY INTERACTION AND PROVIDES A VISUAL AND HAPTIC CONNECTION TO THE OUTDOOR ENVIRONMENT.
- C** RESIDENCES TO THE SOUTH AND WEST ARE EQUIPPED WITH HORIZONTAL PV SHADES AND VERTICAL SHUTTERS TO ALLOW FOR PERSONAL ADJUSTMENT OF SOLAR SHADING/HEATING.
- D** THE OPEN COURTYARD ALLOWS FOR PASSIVE COOLING AND VENTILATION OF INDIVIDUAL RESIDENCES.
- E** A SOLAR ARRAY PROVIDES SIGNIFICANT ENERGY PRODUCTION. PV PANELS ARE REPLACED WITH TRANSLUCENT PANELS OVER THE COURTYARD TO ALLOW LIGHT DEEP INTO THE BUILDING.
- F** CENTRAL HOT WATER IS PROVIDED THROUGH A HIGH EFFICIENCY GROUND SOURCE HEAT PUMP INTEGRATED INTO THE STRUCTURAL PILES.

SITE USER PROFILES

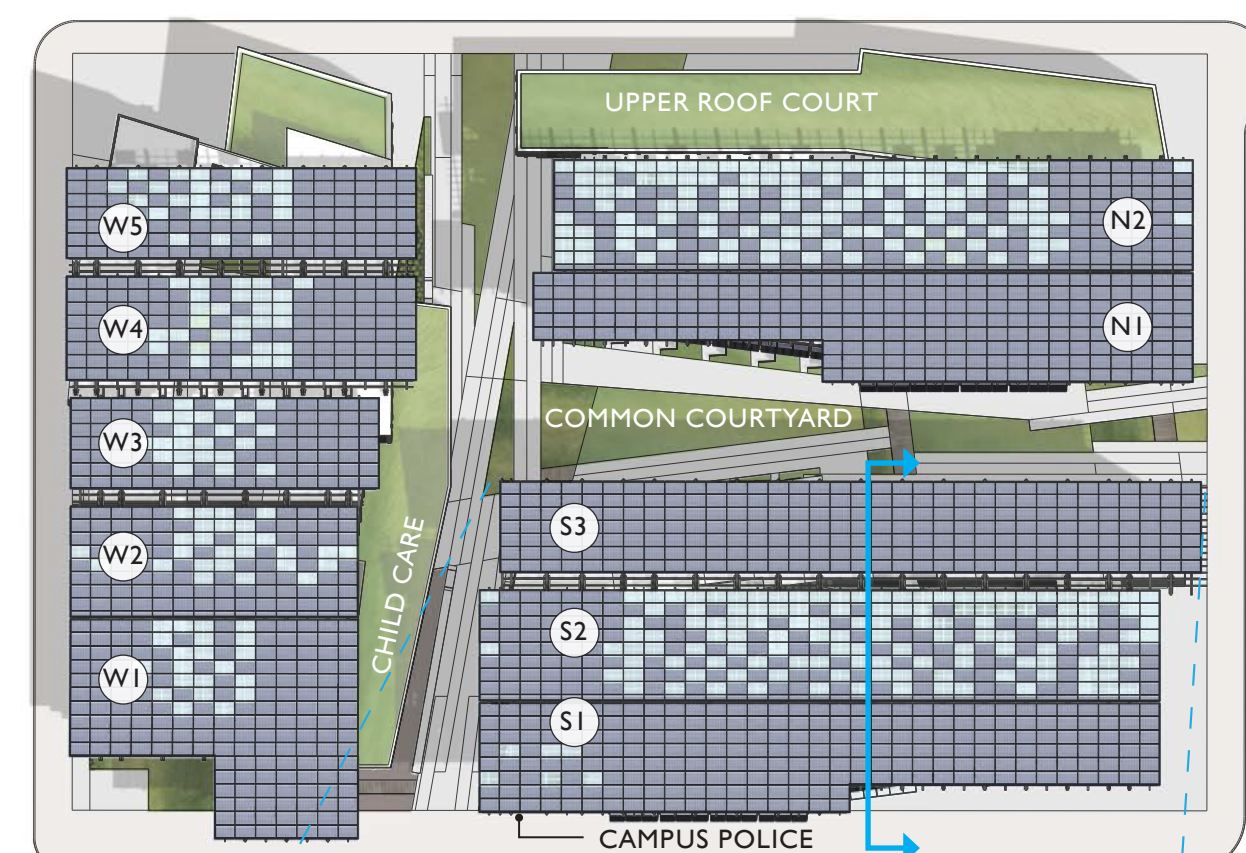


- DEFAULT Residential Use
- - - PROFILE 1: PHD, Masters, DDS, PharmD students (50%)
- - - PROFILE 2: MD, Nursing students (33%)
- - - PROFILE 3: Faculty & families (17%)
- AVERAGE OF UCSF PROFILES 1-3

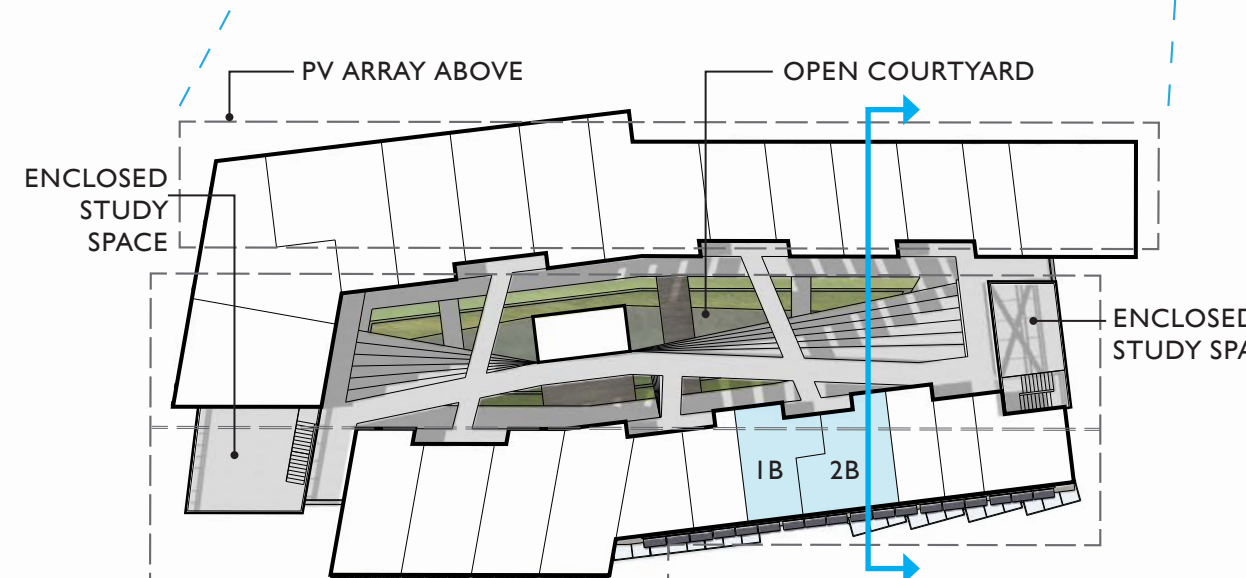


ENERGY CONSERVATION STRATEGIES

Renewable System	Efficiency	Roof Area Utilized (SF)			Total Annual Production (kWh)		
		South Bldg	West Bldg	North Bldg	South Bldg	West Bldg	North Bldg
Solar Photovoltaic	21%	21,586	17,071	13,072	569,425	621,521	336,973
<b>TOTAL</b>		<b>51,729</b>			<b>1,527,918 (12.4 EUI)</b>		



SITE PLAN



SOUTH BUILDING FLOOR PLAN