Renewable Generation
Three primary sources of renewable energy are used throughout the site.

Solar Harvesting
95%
of total power generation

Wind Generation
3%
of total power generation

Wave Energy
2%
of total power generation

These renewable energy sources combine for a total of: **94,152** kwh per year.

Load Reduction
The site also employs a number of load reduction strategies to keep energy use manageable.

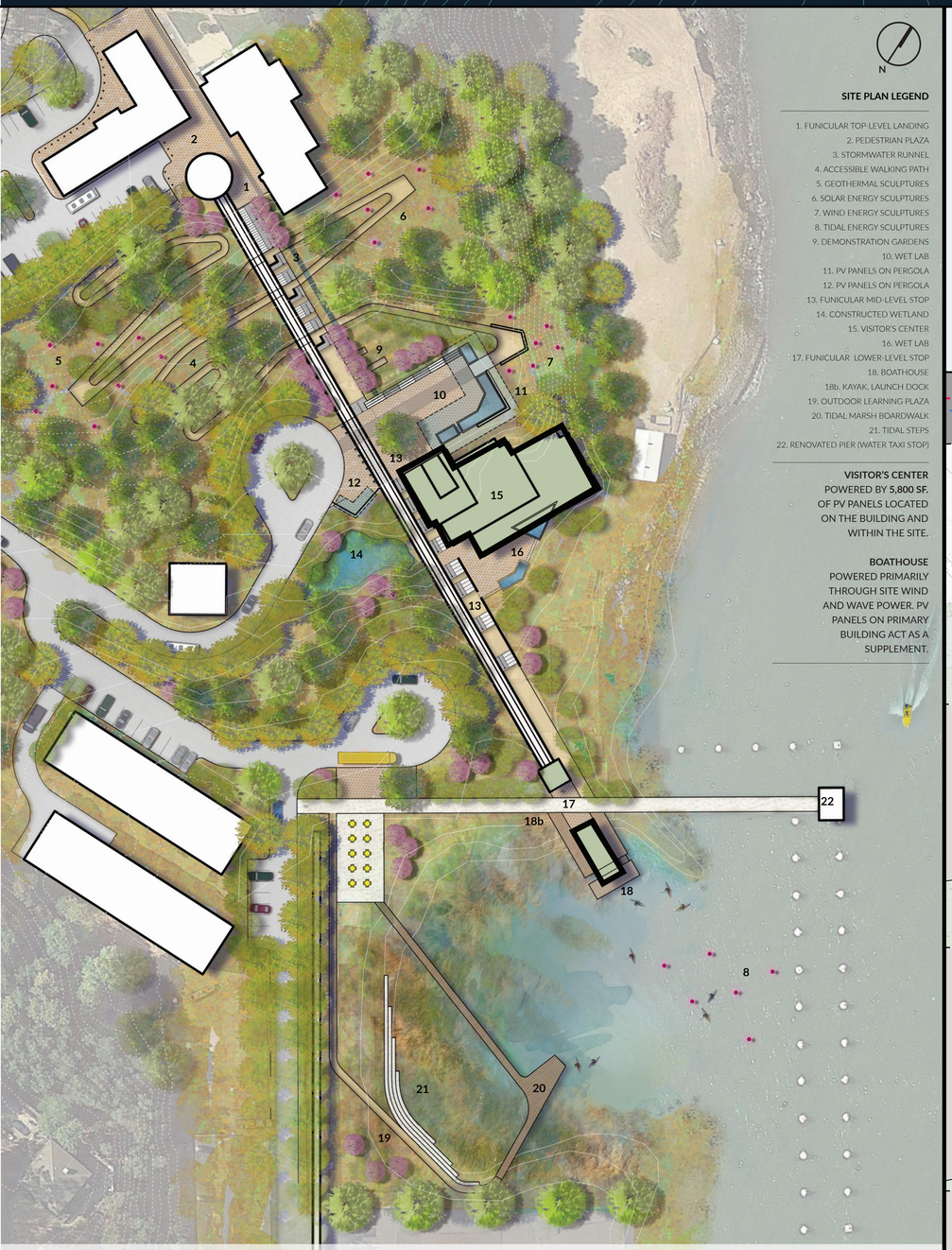
Water Counterbalanced Funicular
Used to transport people from the arrival area to the lower coastal level.

Passive Solar Design
Used to optimize solar harvesting, minimize solar heat gain in warmest months and reduce lighting loads.

Geothermal Heating/Cooling
Used to reduce the energy loads required for the heating and cooling systems

Constructed Wetlands
Used to naturally collect and treat rainwater for use on site.

Cross/Stack Ventilation
Used to minimize the need for forced air heating and cooling.



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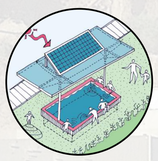
SITE PLAN LEGEND

1. FUNICULAR TOP-LEVEL LANDING
2. PEDESTRIAN PLAZA
3. STORMWATER RUNNEL
4. ACCESSIBLE WALKING PATH
5. GEOTHERMAL SCULPTURES
6. SOLAR ENERGY SCULPTURES
7. WIND ENERGY SCULPTURES
8. TIDAL ENERGY SCULPTURES
9. DEMONSTRATION GARDENS
10. WET LAB
11. PV PANELS ON PERGOLA
12. PV PANELS ON PERGOLA
13. FUNICULAR MID-LEVEL STOP
14. CONSTRUCTED WETLAND
15. VISITOR'S CENTER
16. WET LAB
17. FUNICULAR LOWER-LEVEL STOP
18. BOATHOUSE
18b. KAYAK, LAUNCH DOCK
19. OUTDOOR LEARNING PLAZA
20. TIDAL MARSH BOARDWALK
21. TIDAL STEPS
22. RENOVATED PIER (WATER TAXI STOP)

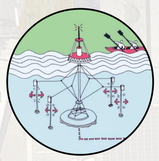
VISITOR'S CENTER
POWERED BY **5,800 SF.** OF PV PANELS LOCATED ON THE BUILDING AND WITHIN THE SITE.

BOATHOUSE
POWERED PRIMARILY THROUGH SITE WIND AND WAVE POWER. PV PANELS ON PRIMARY BUILDING ACT AS A SUPPLEMENT.

TOUCH TANK PV CANOPIES
PV CANOPIES ARE MOUNTED ABOVE THE TOUCH TANKS AT THE ARRIVAL LEVEL TO SHADE VISITORS IN THE WARMER MONTHS WHILE GENERATING ENERGY.

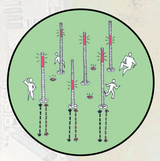


WAVE ENERGY BUOYS
WAVE ENERGY BUOYS ARE LOCATED IN THE KAYAK DOCK AREA, ALLOWING VISITORS TO GET A CLOSE-UP LOOK AS PART OF THEIR PADDELING ROUTE.

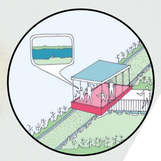


WIND ENERGY SCULPTURES
SMALL WIND TURBINES ARE ATTACHED TO MASTS THROUGHOUT THE BOARDWALK SO VISITORS CAN INTERACT WITH THE COLLECTION PROCESS.

GEOTHERMAL MARKERS
THE GEOTHERMAL WELLS USED TO POWER THE BUILDINGS ARE MARKED BY VERTICAL POLES WHICH ILLUSTRATE THE ACTIVITY OF THE WELL BELOW.



WATER POWERED FUNICULAR
THE FUNICULAR IS POWERED BY GRAVITY AND A WATER BASED COUNTERWEIGHT SYSTEM, ALLOWING IT TO OPERATE ENERGY NEUTRAL.



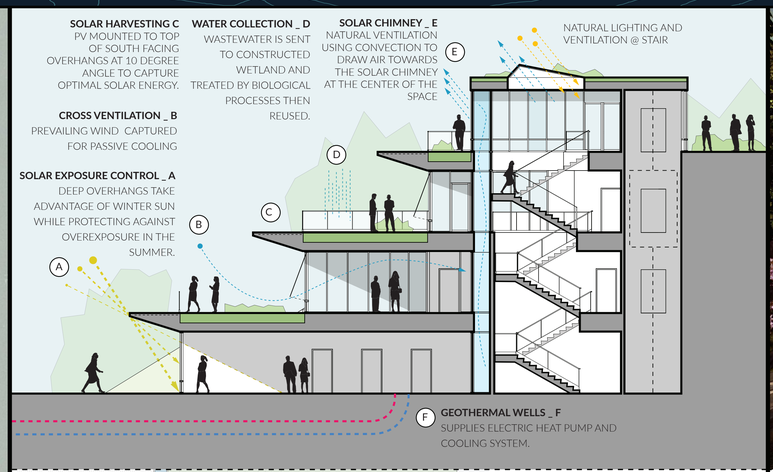
SOLAR HARVESTING C
PV MOUNTED TO TOP OF SOUTH FACING OVERHANGS AT 10 DEGREE ANGLE TO CAPTURE OPTIMAL SOLAR ENERGY.

CROSS VENTILATION _ B
PREVAILING WIND CAPTURED FOR PASSIVE COOLING

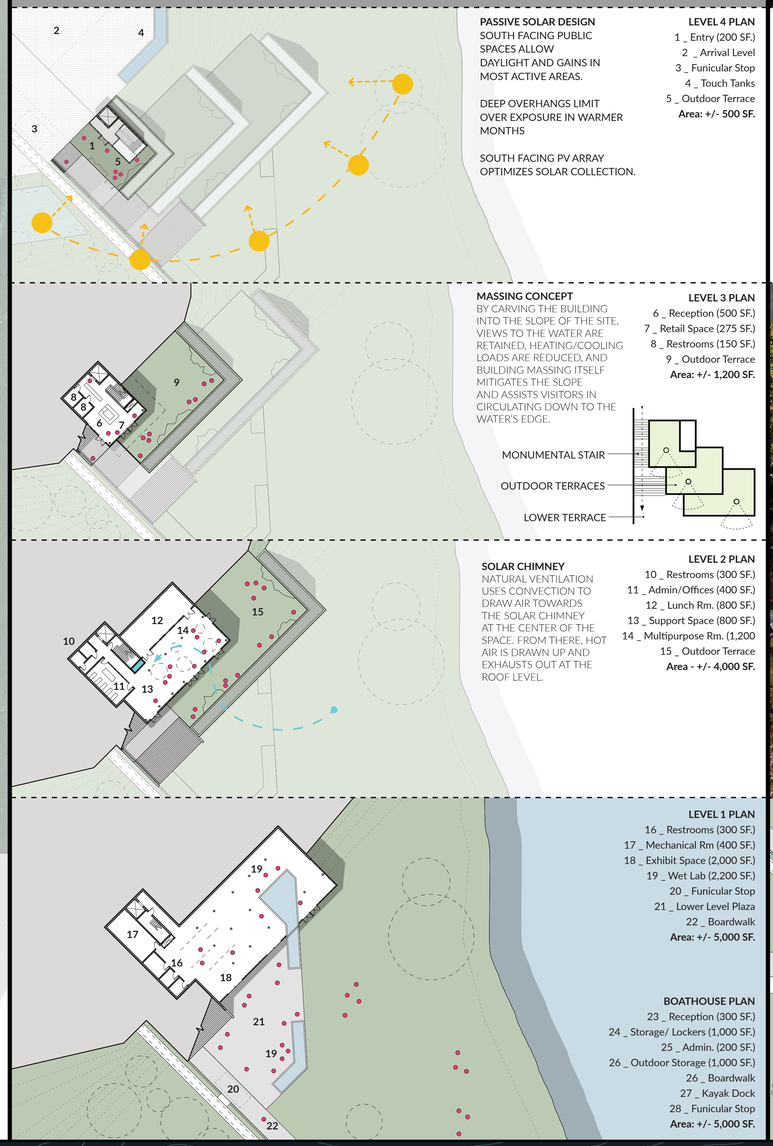
SOLAR EXPOSURE CONTROL _ A
DEEP OVERHANGS TAKE ADVANTAGE OF WINTER SUN WHILE PROTECTING AGAINST OVEREXPOSURE IN THE SUMMER.

WATER COLLECTION _ D
WASTEWATER IS SENT TO CONSTRUCTED WETLAND AND TREATED BY BIOLOGICAL PROCESSES THEN REUSED.

SOLAR CHIMNEY _ E
NATURAL VENTILATION USING CONVECTION TO DRAW AIR TOWARDS THE SOLAR CHIMNEY AT THE CENTER OF THE SPACE



GEOTHERMAL WELLS _ F
SUPPLIES ELECTRIC HEAT PUMP AND COOLING SYSTEM.



PASSIVE SOLAR DESIGN
SOUTH FACING PUBLIC SPACES ALLOW DAYLIGHT AND GAINS IN MOST ACTIVE AREAS.

DEEP OVERHANGS LIMIT OVER EXPOSURE IN WARMER MONTHS

SOUTH FACING PV ARRAY OPTIMIZES SOLAR COLLECTION.

LEVEL 4 PLAN
1 _ Entry (200 SF.)
2 _ Arrival Level
3 _ Funicular Stop
4 _ Touch Tanks
5 _ Outdoor Terrace
Area: +/- 500 SF.

MASSING CONCEPT
BY CARVING THE BUILDING INTO THE SLOPE OF THE SITE, VIEWS TO THE WATER ARE RETAINED, HEATING/COOLING LOADS ARE REDUCED, AND BUILDING MASSING ITSELF MITIGATES THE SLOPE AND ASSISTS VISITORS IN CIRCULATING DOWN TO THE WATER'S EDGE.

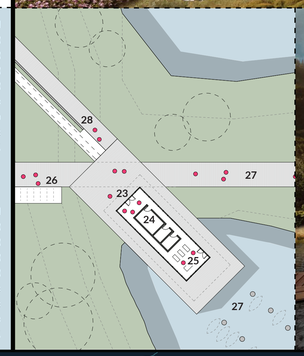
LEVEL 3 PLAN
6 _ Reception (500 SF.)
7 _ Retail Space (275 SF.)
8 _ Restrooms (150 SF.)
9 _ Outdoor Terrace
Area: +/- 1,200 SF.

SOLAR CHIMNEY
NATURAL VENTILATION USES CONVECTION TO DRAW AIR TOWARDS THE SOLAR CHIMNEY AT THE CENTER OF THE SPACE. FROM THERE, HOT AIR IS DRAWN UP AND EXHAUSTS OUT AT THE ROOF LEVEL.

LEVEL 2 PLAN
10 _ Restrooms (300 SF.)
11 _ Admin/Offices (400 SF.)
12 _ Lunch Rm. (800 SF.)
13 _ Support Space (800 SF.)
14 _ Multipurpose Rm. (1,200
15 _ Outdoor Terrace
Area - +/- 4,000 SF.

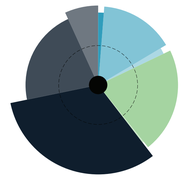
LEVEL 1 PLAN
16 _ Restrooms (300 SF.)
17 _ Mechanical Rm (400 SF.)
18 _ Exhibit Space (2,000 SF.)
19 _ Wet Lab (2,200 SF.)
20 _ Funicular Stop
21 _ Lower Level Plaza
22 _ Boardwalk
Area: +/- 5,000 SF.

BOATHOUSE PLAN
23 _ Reception (300 SF.)
24 _ Storage/ Lockers (1,000 SF.)
25 _ Admin. (200 SF.)
26 _ Outdoor Storage (1,000 SF.)
26 _ Boardwalk
27 _ Kayak Dock
28 _ Funicular Stop
Area: +/- 5,000 SF.



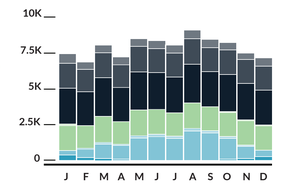
SEGMENT	KWP /YEAR	
HEATING	**1,183**	**1%**
AHU	0%	0%
ZONES	1,183	1%
HUMIDIFICATION	0%	0%
COOLING	**15,534**	**16%**
AHU	14,388	15%
HEAT REJECTION	0%	0%
ZONES	1,146	1%
FANS	**20,540**	**22%**
AHU	20,239	21%
ZONES	301	0%
INTERIOR	**50,578**	**54%**
LIGHTING	30,237	32%
EQUIPMENT	20,231	21%
PUMPS	**6,317**	**7%**

ANNUAL ENERGY USE



94,152
KWH PER YEAR

MONTHLY ENERGY USE



PROJECT EUI
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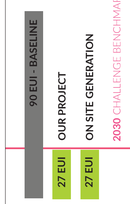

Bay Area Transect combines site-sensitive planning, zero-net energy design, and innovative placemaking strategies to build upon the Romberg Tiburon Center's vision of connecting science, society, and the sea.

The site's overall accessibility and vertical grade change is addressed with a water counterbalancing funicular which connects the waterfront with existing facilities at the top of the hillside. In addition to reducing the need for vehicular transportation throughout the site, the funicular also connects a variety of pedestrian options, such as a monumental stair and an accessible walking path that offers panoramic views to the bay.

Throughout the site, passive and active landscape interventions provide a variety of educational experiences while supporting the overall net-zero goals and on-site renewable power requirements of the project. Bay Area Transect proposes a protected tidal inlet that allows beginner kayakers to explore and connect with the coastal ecosystem.

The Visitor's Center gently distributes the program across 4-tiers to minimize site disturbance and maximize daylighting and views to the bay. The natural grading of the site and proposed stacking of the program allows for passive ventilation measures to significantly reduce the energy required to ventilate the building. The Boathouse, is a multipurpose waterfront pavilion that acts as an activated terminus of the site funicular and connection to the tidal marsh boardwalk and renovated pier.

The proposed alterations to the San Francisco State Romberg Tiburon Campus have a simple goal: to allow visitors to explore the coastal ecosystem as well as the sustainable technologies that power its preservation. With that in mind, Bay Area Transect illustrates how good design and appreciation for the natural environment go hand in hand.

Bay Area Transect

Architecture at Zero _ 2018