SPIRIT OF THE UNTAMED

SKY
CASTLE
NATURE

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CONTENTS:

BRIEF:

" DAZZLED BY THE BRIGHTNESS OF OUR METROPOLIS, WE OFTEN FORGET THE EXTRAORDINARY VISION THE VAULT OF HEAVEN CAN OFFER US. HOWEVER, THERE ARE STILL PLACES THAT ARE FAR FROM LIGHTS AND CITIES WHERE THE BEAUTY OF THE INFINITE APPEARS IN ITS ENTIRE SPLENDOR. SURROUNDED BY FORESTS AND CRAGS, ROCCASCALEGNA IS ONE OF THE PLACES WHERE THIS MAGIC CONTINUES TO OCCUR AND WHERE THE SKY KEEPS ON TELLING ITS ETERNAL AND BEAUTIFUL STORY.
IT IS A UNIQUE AND FAR PLACE THAT IS BOTH INCREDIBLY BEAUTIFUL AND CLEARLY FRAGILE. IN FACT, THE FORTRESS DEEPLY DEPENDS ON THE CONSTANT CARE OF THE HUMAN BEING TO PRESERVE ITS CHARACTERISTICS AND REMARKABLE APPEARANCE.
FOR THESE REASONS, THE ITALIAN EXHIBITION GROUP AND THE ITALIAN GOVERNMENT LAUNCHED THE OBSERVATORY HOUSES PROJECT AIMING TO FIND A NEW USE FOR ROCCASCALEGNA TAKING ADVANTAGE OF THE POTENTIAL OF AN ONEIRIC SETTING WITH REMARKABLE SKIES. THE PROJECT AIMS AT CREATING IN ITALY THE FIRST AND MOST SUGGESTIVE OBSERVATORY HOUSES. THEY WILL BE A SUSTAINABLE AND EXCLUSIVE HOUSE MODEL AIMED TO ENSURE THE PROTECTION AND IMPROVEMENT OF SUCH INESTIMABLE HERITAGE.

HOW TO BUILD A COMPLEX OF MODERN OBSERVATORY HOUSES IN A PICTURESQUE MEDIEVAL FORTRESS? HOW TO CREATE THE MOST RE FINED NATIONAL REFERENCE FOR THE ASTRONOMICAL OBSERVATION TOURISM THROUGH ARCHITECTURE? "

" ON THE BASES OF THESE ISSUES, DESIGNERS WILL HAVE TO CREATE A STORY COMPOSED BY STARS, SILENCES AND LANDSCAPES. THIS STORY WILL HAVE TO INCLUDE ARCHITECTURAL ELEMENTS DESIGNED TO CREATE A PLACE BEYOND COMPARE. IT WILL NOT BE A PLACE OF MERE OBSERVATION OR ACCOMMODATION; IT WILL BE A PLACE OF SPIRITUALITY AND MEDITATION. OBSERVATORY HOUSES WISHES TO PROMOTE AN ARCHITECTURAL INTERVENTION THAT AIMS AT BECOMING A SYMBOL DESTINATION FOR THOSE WHO WISH TO MOVE AWAY FROM THEIR EVERYDAY ROUTINE AND LIVE AN ARCHAIC, ALMOST MYSTIC EXPERIENCE THANKS TO THE MOST ANCIENT AND BEAUTIFUL SIGHT.
UNDER EVERLASTING SKIES, THE NEW OBSERVATORY HOUSES IN THE ANCIENT FORTRESS WILL PROVIDE AN UNFORGETTABLE STAY FOR THOSE WHO WISH TO EXPERIENCE THE FERAL EXCITEMENT TO FALL ASLEEP UNDER THE STARS ROCKED BY THE SLOW MOVEMENT OF PLANETS AND FASCINATED BY A SUDDEN SHOOTING STAR. "

CONTEXT:

THE SKY:

" THE NOCTURNAL SKY IS ETERNAL, SUBLIME AND INACCESSIBLE. WHEN LOOKING AT IT, THE HUMAN BEING EXPERIENCES THE MOST ANCIENT SENSATION AND FEELS OVERWHELMED BY AN ANCIENT AND INVIOLABLE MYSTERY. A MYSTERY THAT NOT EVEN THE MOST MODERN AND Z MINDS CAN UNDERSTAND, DESPITE EFFORTS AND TECHNOLOGICAL PROGRESS.
DAZZLED BY THE BRIGHTNESS OF OUR METROPOLIS, WE OFTEN FORGET THE EXTRAORDINARY VISION THE VAULT OF HEAVEN CAN OFFER US. HOWEVER, THERE ARE STILL PLACES THAT ARE FAR FROM LIGHTS AND CITIES WHERE THE BEAUTY OF THE INFINITE APPEARS IN ITS ENTIRE SPLENDOR. SURROUNDED BY FORESTS AND CRAGS, ROCCASCALEGNA IS ONE OF THE PLACES WHERE THIS MAGIC CONTINUES TO OCCUR AND WHERE THE SKY KEEPS ON TELLING ITS ETERNAL AND BEAUTIFUL STORY.
IT IS A UNIQUE AND FAR PLACE THAT IS BOTH INCREDIBLY BEAUTIFUL AND CLEARLY FRAGILE. IN FACT, THE FORTRESS DEEPLY DEPENDS ON THE CONSTANT CARE OF THE HUMAN BEING TO PRESERVE ITS CHARACTERISTICS.
AND REMARKABLE APPEARANCE. "

THE CASTLE:

" THE FORTRESS SEEMS SURREAL AS IF IT WAS A METAPHOR OF THE ATAVISTIC TENSION THAT SINCE PREHISTORIC TIMES HAS BEEN INCLINING THE HUMAN BEING TOWARDS THE SKY. THERE ARE NO WORDS TO DESCRIBE THE FASCINATION OF THE FORTRESS. IT IS AN ENCHANTED YET REAL PLACE. ITS HISTORY ENCOMPASSES ERAS, UPS AND DOWNS OF HISTORY, PEOPLES AND EVENTS. IT IS A MARVELOUS BUILDING IN A HARSH AND UNTAMABLE LAND COMPOSED BY SHARP ROCKS AND A WILD NATURE. NOWADAYS, THIS PLACE IS HIGHLY FASCINATING AS IT SURELY WAS HUNDREDS OF YEARS AGO WHEN THE LOMBARDS CHOSE IT TO BUILD ONE OF THE MOST SUGGESTIVE CASTLES OF SOUTHERN EUROPE. IT IS A PLACE THAT TELLS A STORY OF WARS, MYSTERIES AND POWER. THE FORTRESS HAS BEEN INSPIRING THE CREATIVITY OF DIRECTORS AND SCRIPTWRITERS. "

THE NATURE:

" THE FORTRESS ITSELF IS A HIGHLY VALUABLE ELEMENT. HOWEVER, IT IS CRUCIAL TO ACKNOWLEDGE THAT ALSO ITS NATURAL SYSTEM IS ONE OF THE MOST DIVERSIFIED AND VALUABLE OF ITALY. THE NATURE SURROUNDING ROCCASCALEGNA IS ANCIENT AND FASCINATING. IT ENCOMPASSES GNARLED OLIVE TREES AND JUNIPER BUSHES WITH DRY AND SCENTED WOODS. HIGH CRAGS SURROUND THE FORTRESS UP TO RIO SECCO, WHICH IS A ROCKY STREAM THAT MARKS TO THE WEST THE LOWEST POINT OF THE VALLEY. FROM THIS POINT THE VALLEY GOES UP TO GESSOPALENA FROM WHERE IT GOES DOWN AND THEN GOES UP AGAIN UNTIL REACHING 2.800 METERS IN THE MASSIF OF THE MAJELLA. THE SURROUNDING NATURE ENCOMPASSES A GREAT VARIETY OF LANDSCAPES AND NATURAL CONDITIONS: FROM THE MOST FEASIBLE AND IDYLLIC CONDITIONS TO THE MOST EXTREME AND INHOSPITABLE ONES. THERE ARE CAVES, HERMITAGES, GRASSLANDS, FORESTS, HUMID AREAS, DESERT AND INHOSPITABLE PEAKS HIT BY STORMS THAT CAN REACH 100 KM/H IN WINTER. IT IS A FLOURISHING, DIVERSIFIED AND WILD NATURE WHERE THE HUMAN BEING IS ONLY A GUEST IN FORESTS INHABITED BY WOLFS, MOUNTAINS POPULATED BY BEARS AND SKIES DOMINATED BY EAGLES THAT, AS IN THE PAST, FLY ACROSS THE SKIES WITH MAJESTIC AND REGAL MAGNIFICENCE. "

CONCEPT:

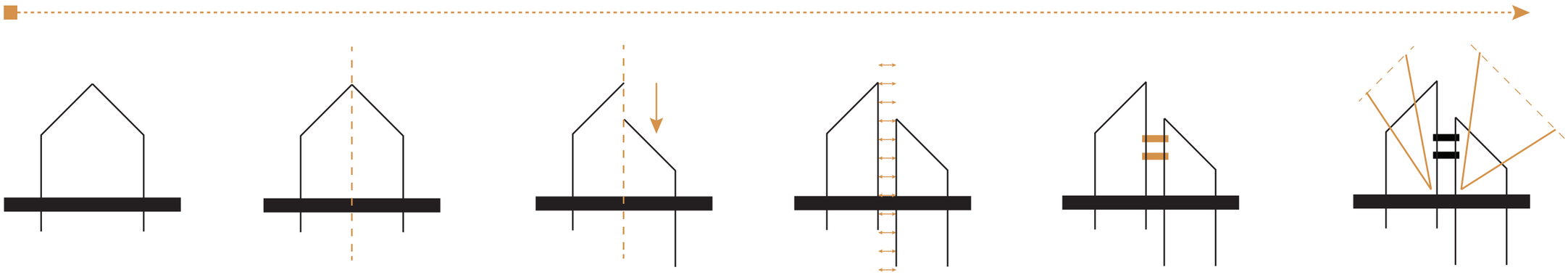
THE PURPOSE OF THE PROJECT IS TO CREATE ARCHITECTURE THAT REMAINS TRUE IN ITS FORM TO THE SPIRIT OF THE ANCIENT. THE MAGNIFICENT CASTLE AT THE PEAK SERVES AS AN AXIS OF REFLECTION BETWEEN THE EXISTING HISTORIC VILLAGE AND THE MODERN VILLAGE TO BE.

STARTING FROM THE TYPICAL SHAPE OF THE HOUSE, THE CENTRAL AXIS IS DETERMINED AND THEN THE FORM IS SLICED AND SPLIT ACCORDING TO THAT AXIS. THE TWO RESULTING VOLUMES ARE THEN STITCHED BACK TOGETHER WITH AN ELEMENT THAT IS BOTH FUNCTIONAL AND AESTHETIC...

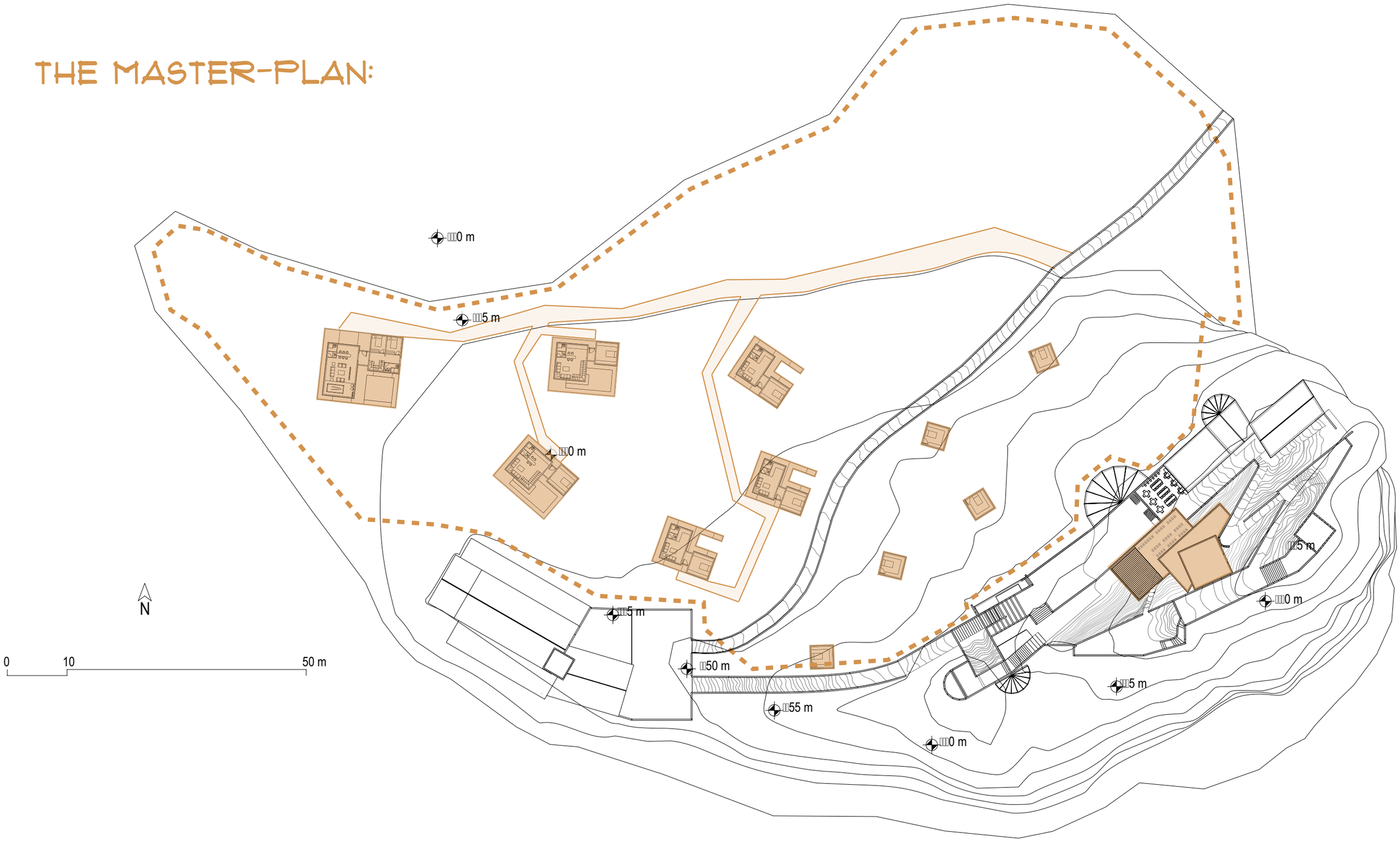
THE DESIGN OF THE CABINS ALLOWS FOR THE CONNECTION TO HAPPEN BETWEEN EARTH AND SKY THROUGH THE GLAZED TOP OF THE ARCHITECTURE THAT FRAMES VIEWS INTO THE SKY AND SERVES AS A WINDOW TO HEAVEN.

THE MATERIALITY OF THE PROJECT FLOWS CONSISTENTLY FROM THE SURROUNDING CONTEXT. THE RESIDENTIAL UNITES ARE A COMBINATION OF STONE AND WOOD IN WHICH THE STONE IS TEXTURED TO MIMIC THE CASTLE AND THE WOOD TO MIMIC THE SITE.

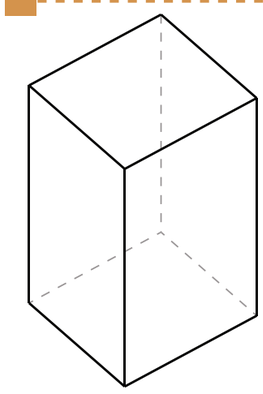
EVERY LIVING UNIT, DESPITE ITS SCALE HAS A CABIN ELEMENT THAT IS DEDICATED TO THE FUNCTION OF OBSERVING THE SKY AND ITS MAJESTIC COMPONENTS.


ANCIENT
AXIS
SHIFT
SPLIT
STITCH
MODERN

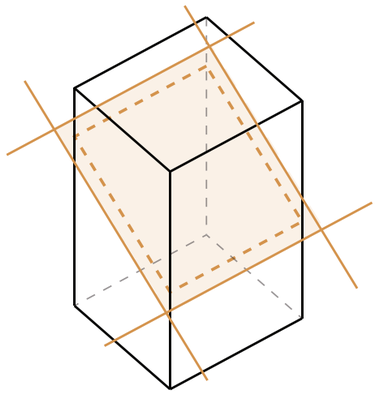
THE MASTER-PLAN:



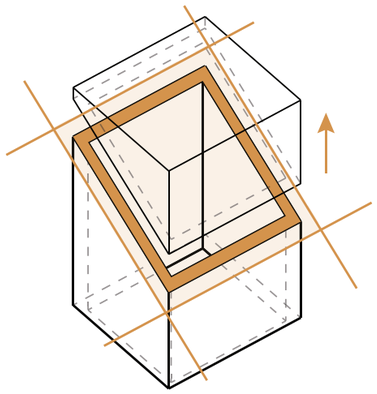
THE CABIN:



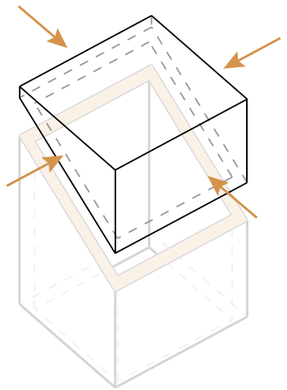
TYPICAL



SLICE



LIFT



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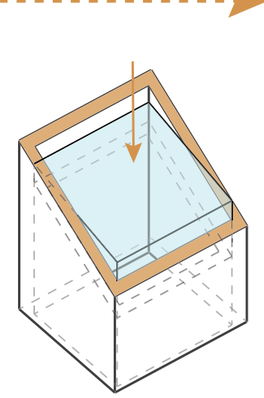
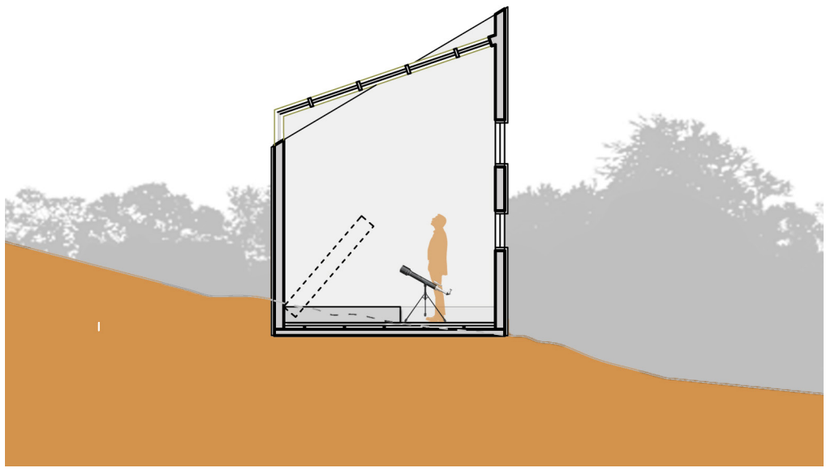
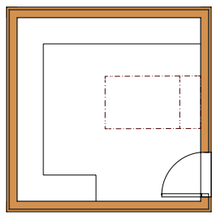
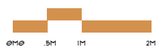


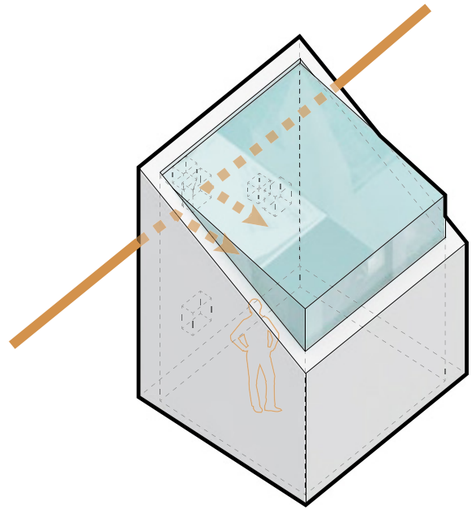
CABIN





PLAN





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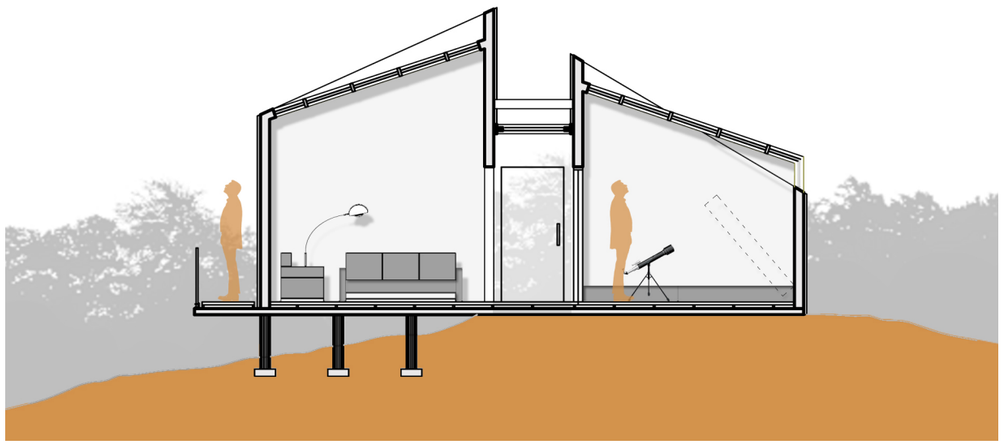
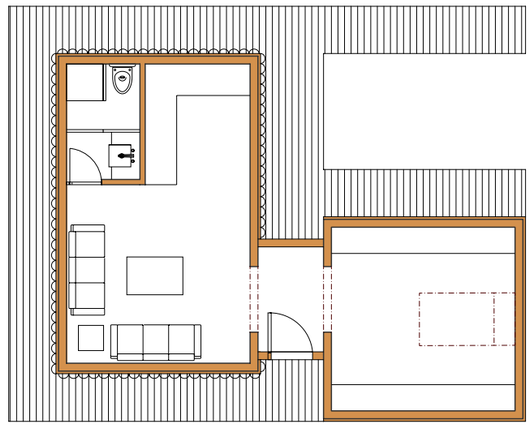
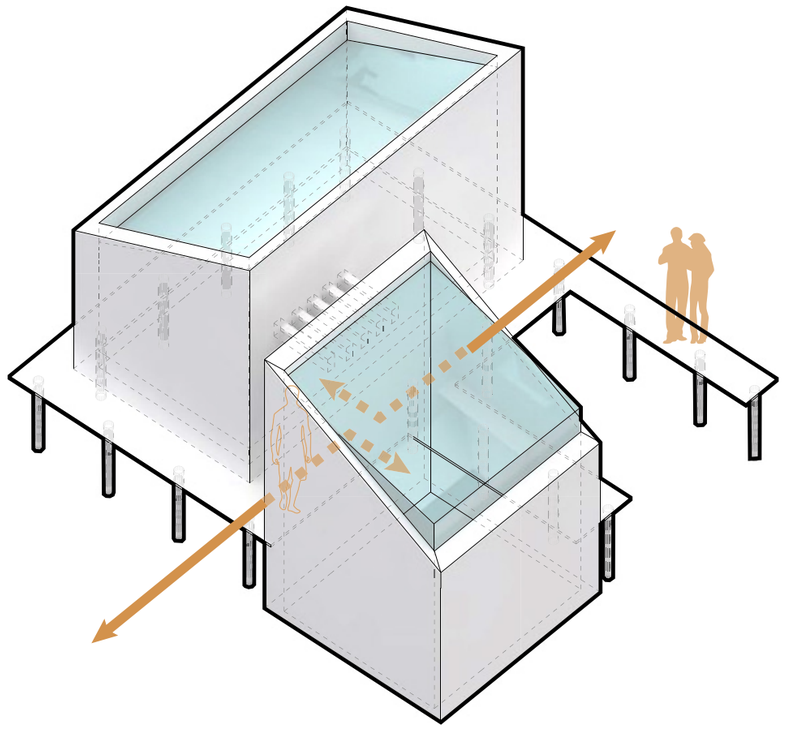
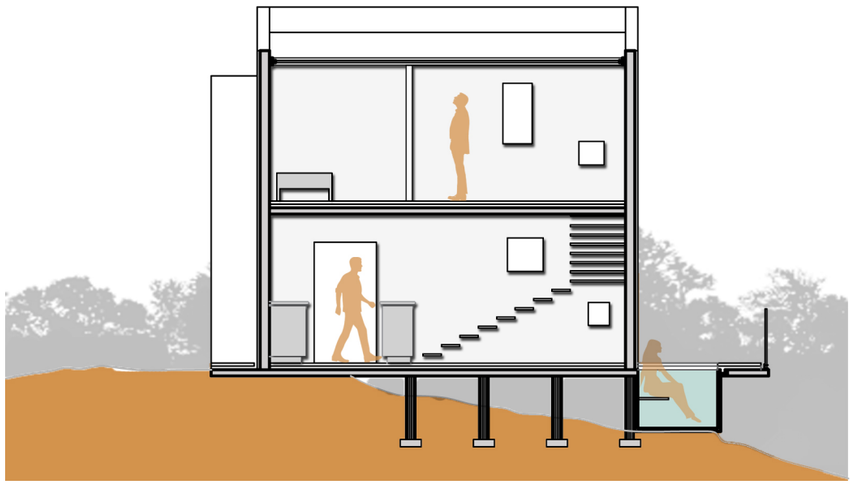


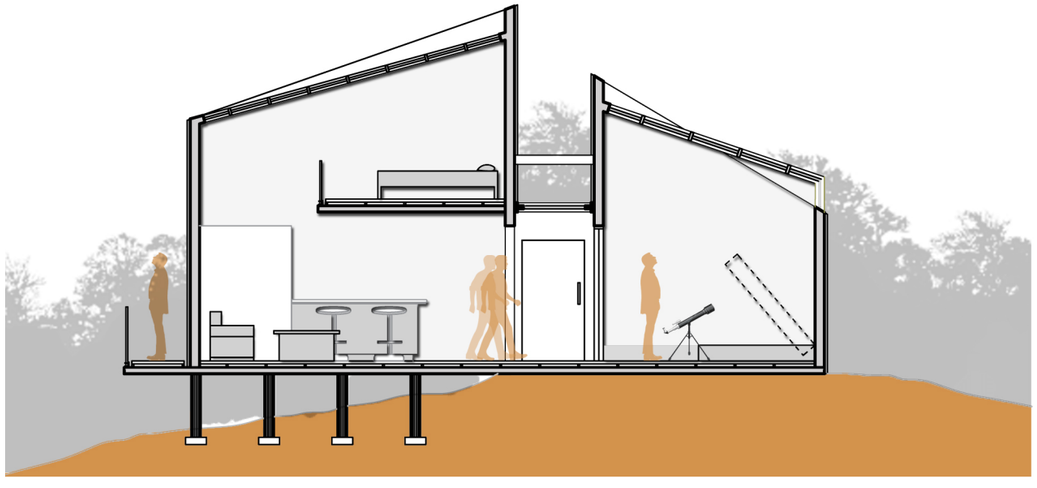


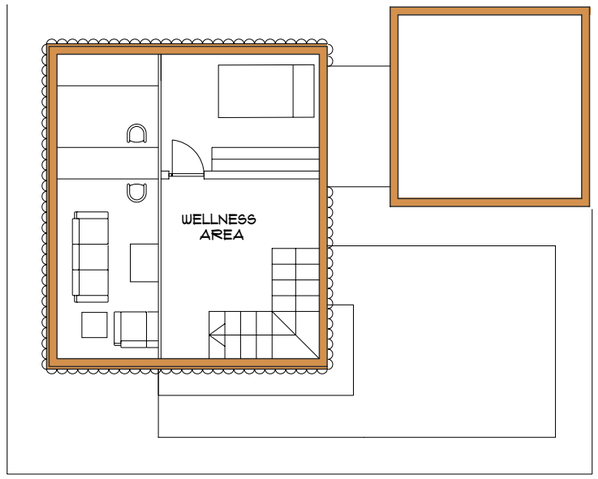
GROUND FLOOR



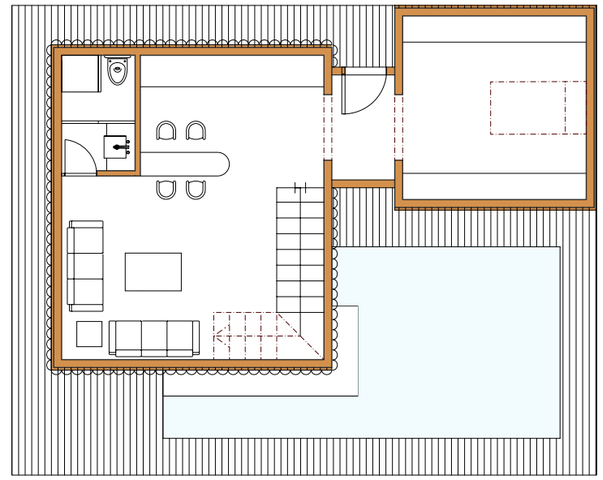
THE HOUSE:



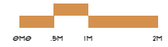


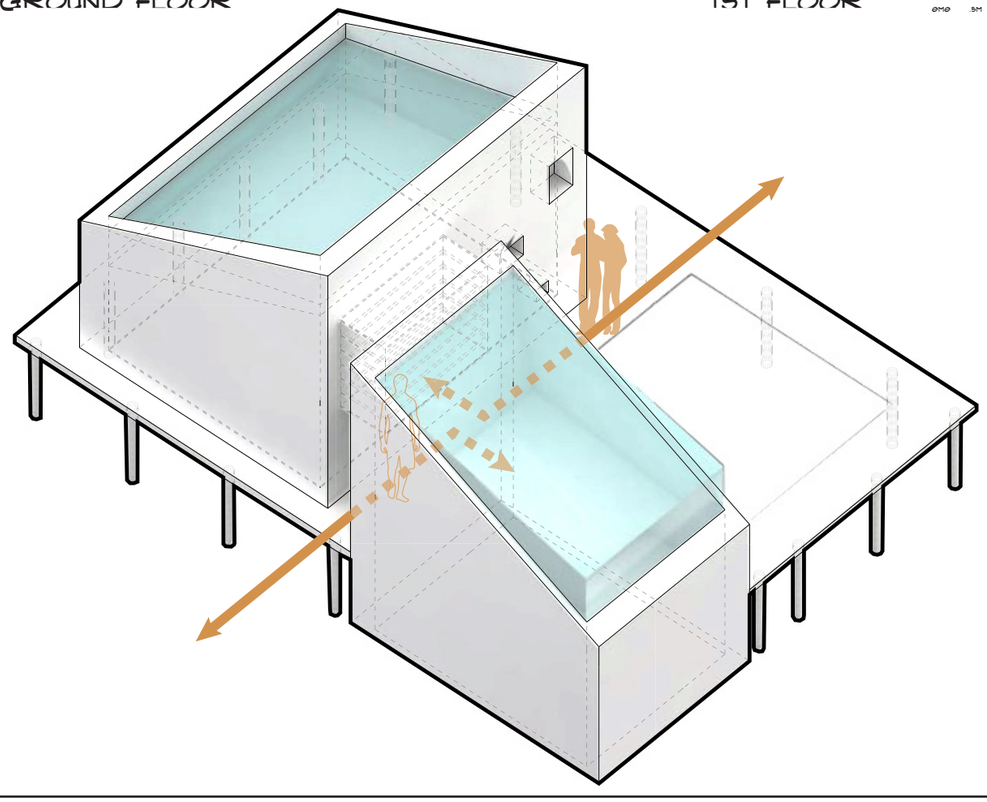


GROUND FLOOR

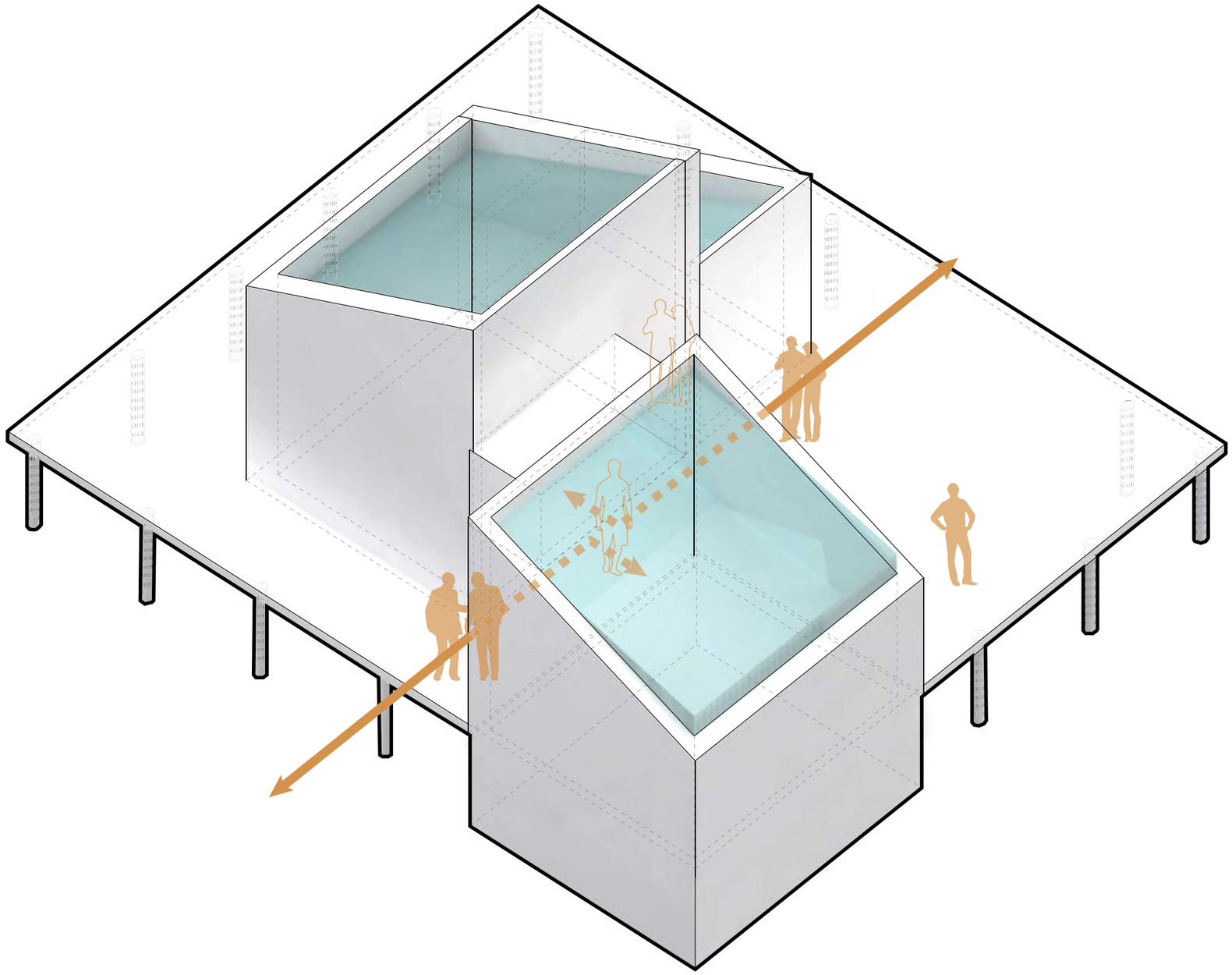


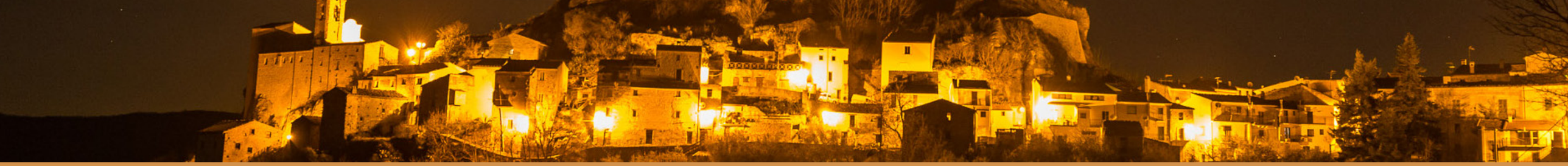
1ST FLOOR

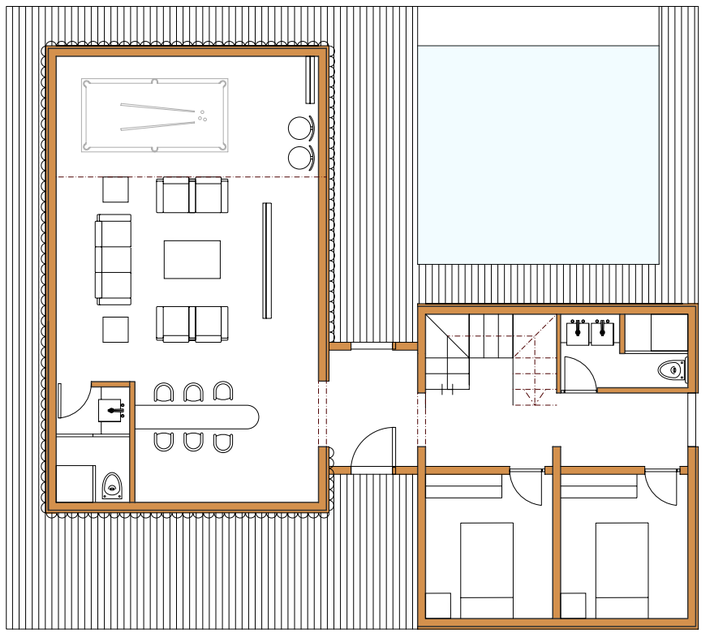


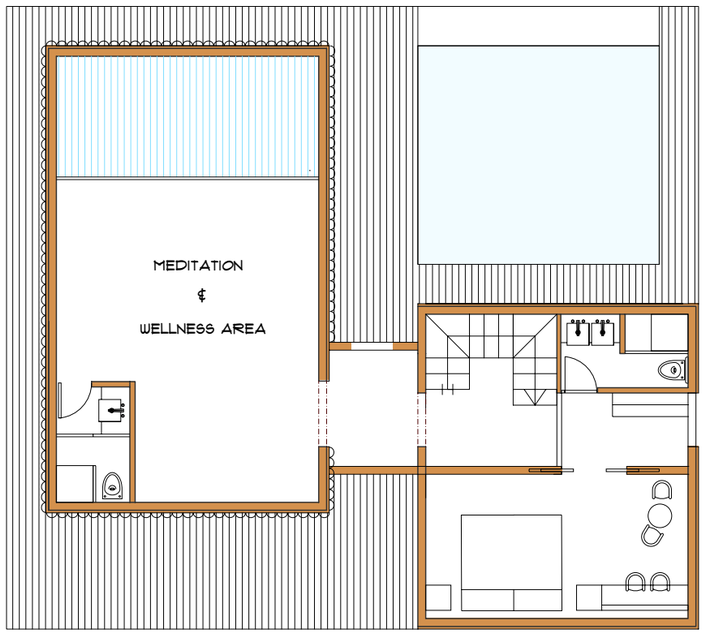


THE VILLA:









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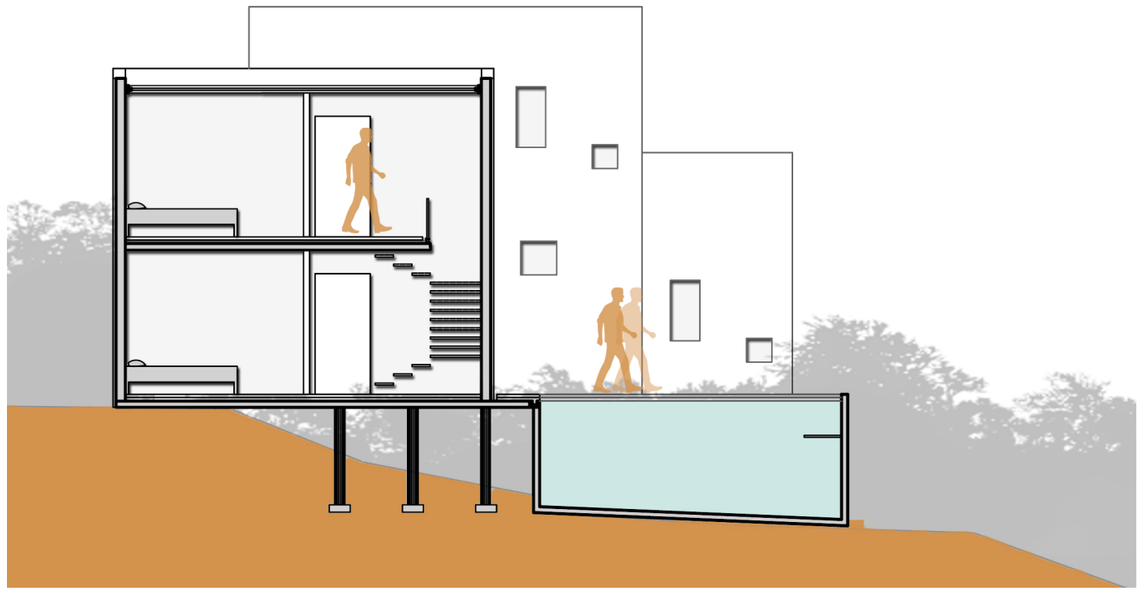

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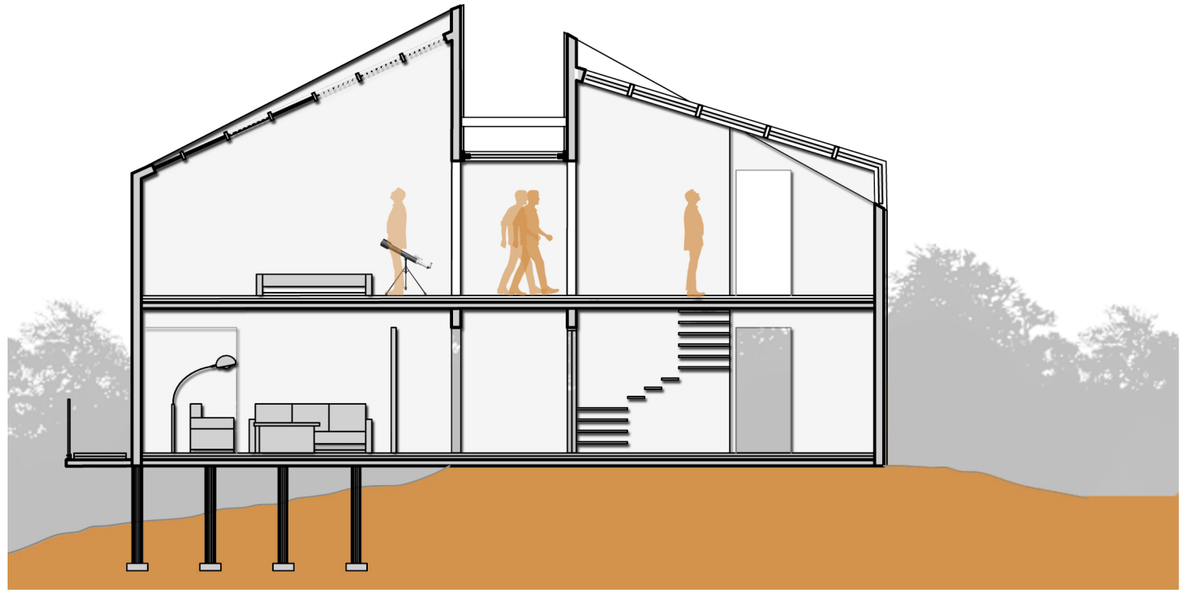
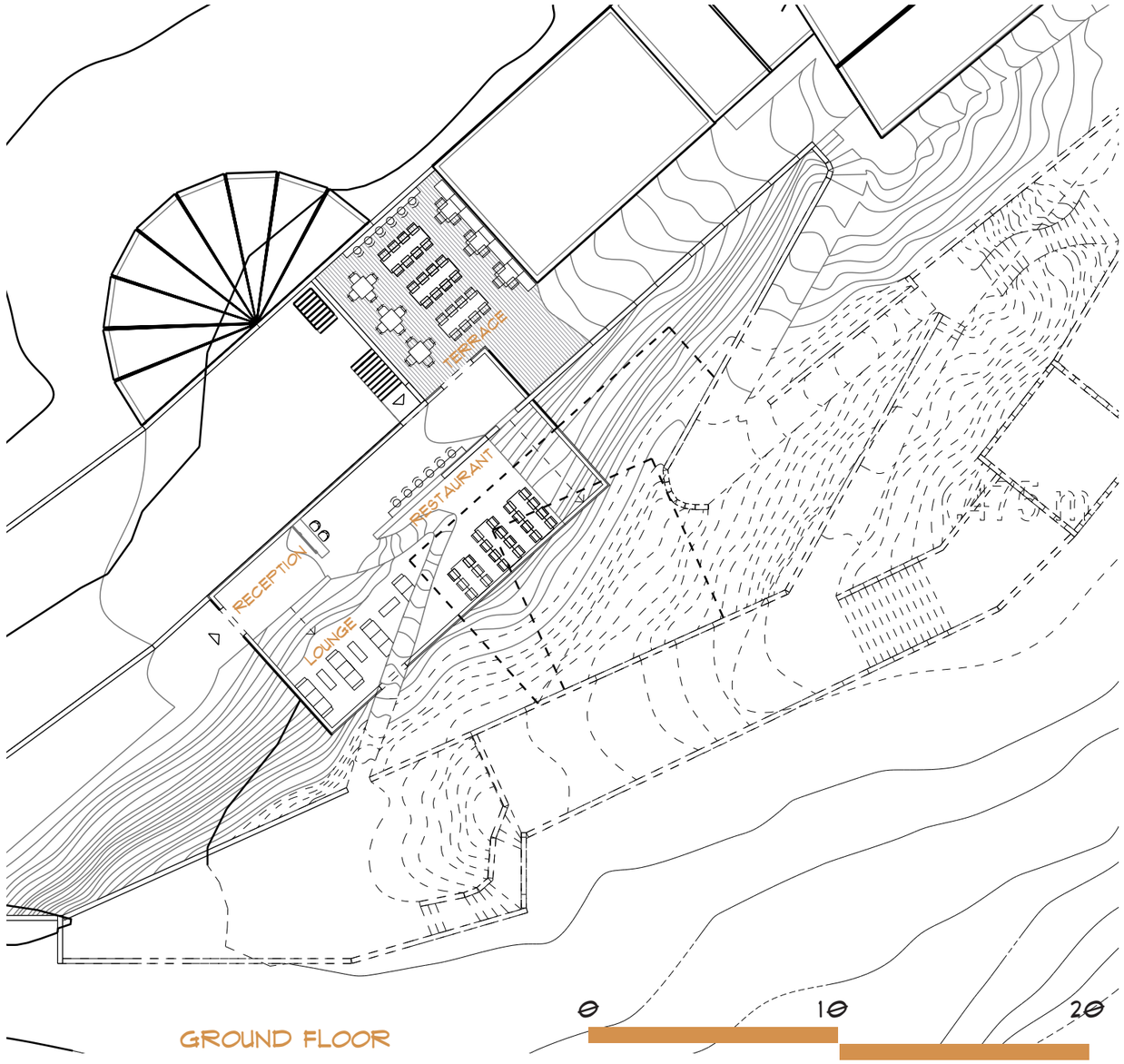


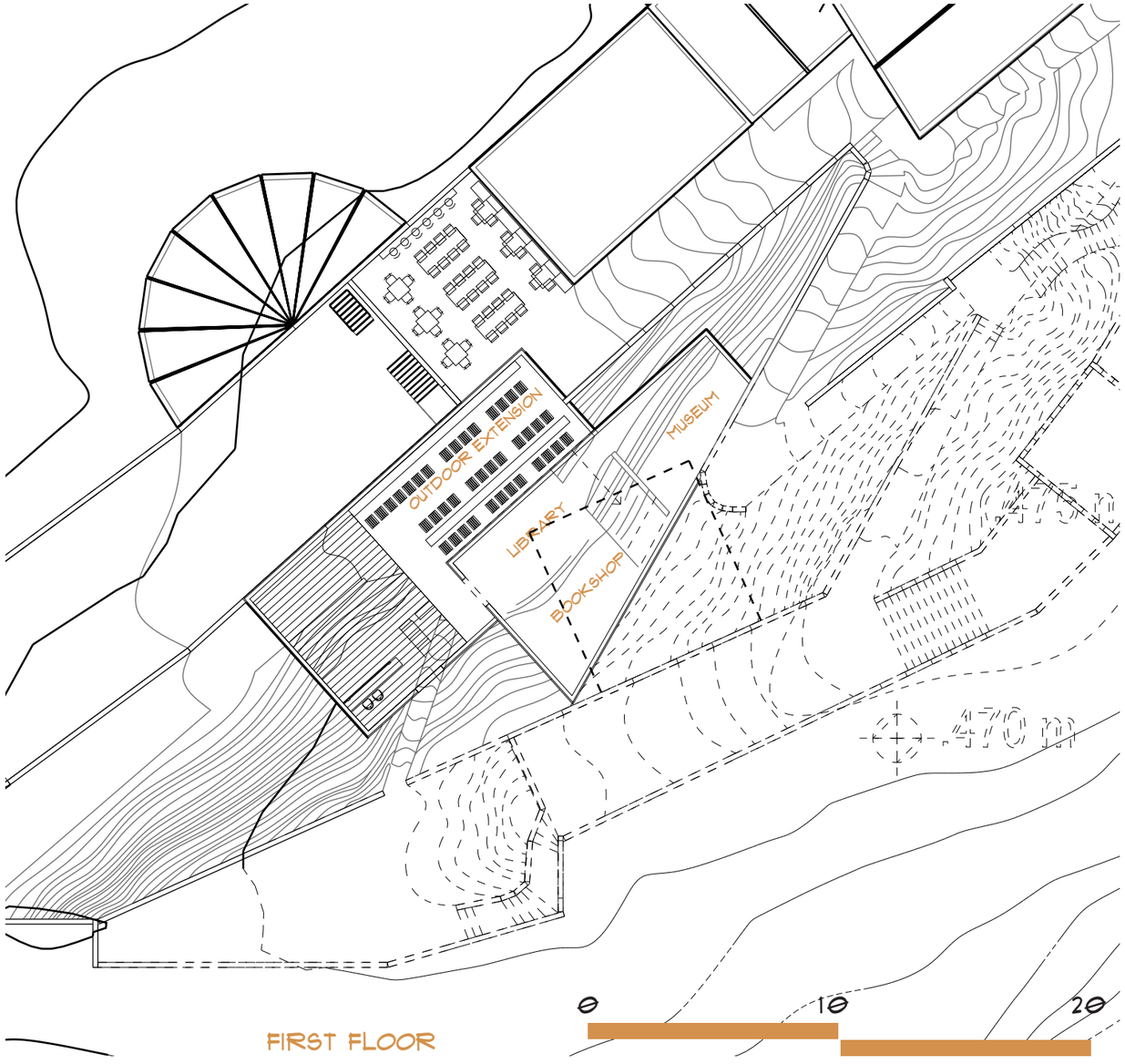
THE SKYLOUNGE:



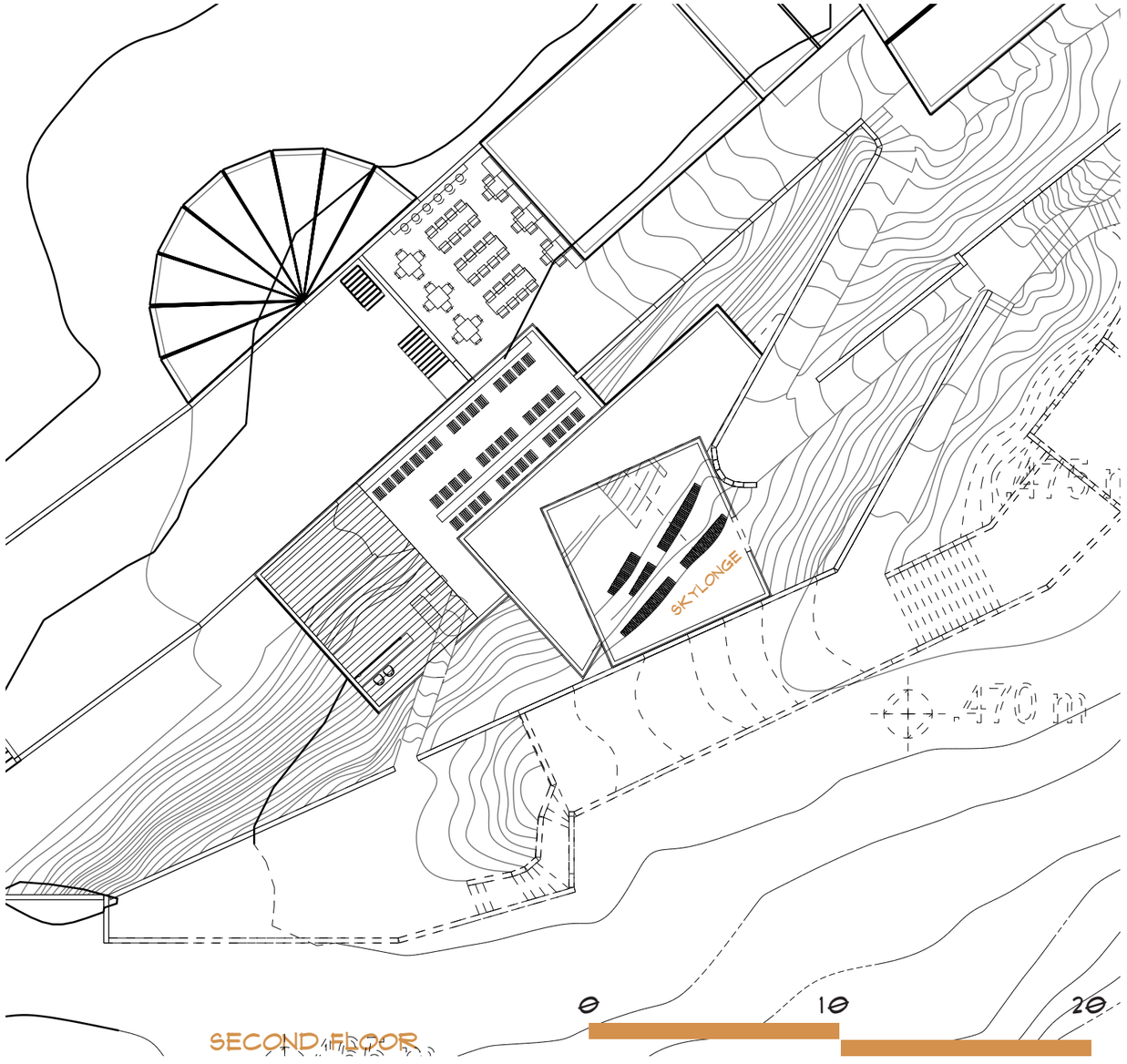
GROUND FLOOR

EXTERIOR

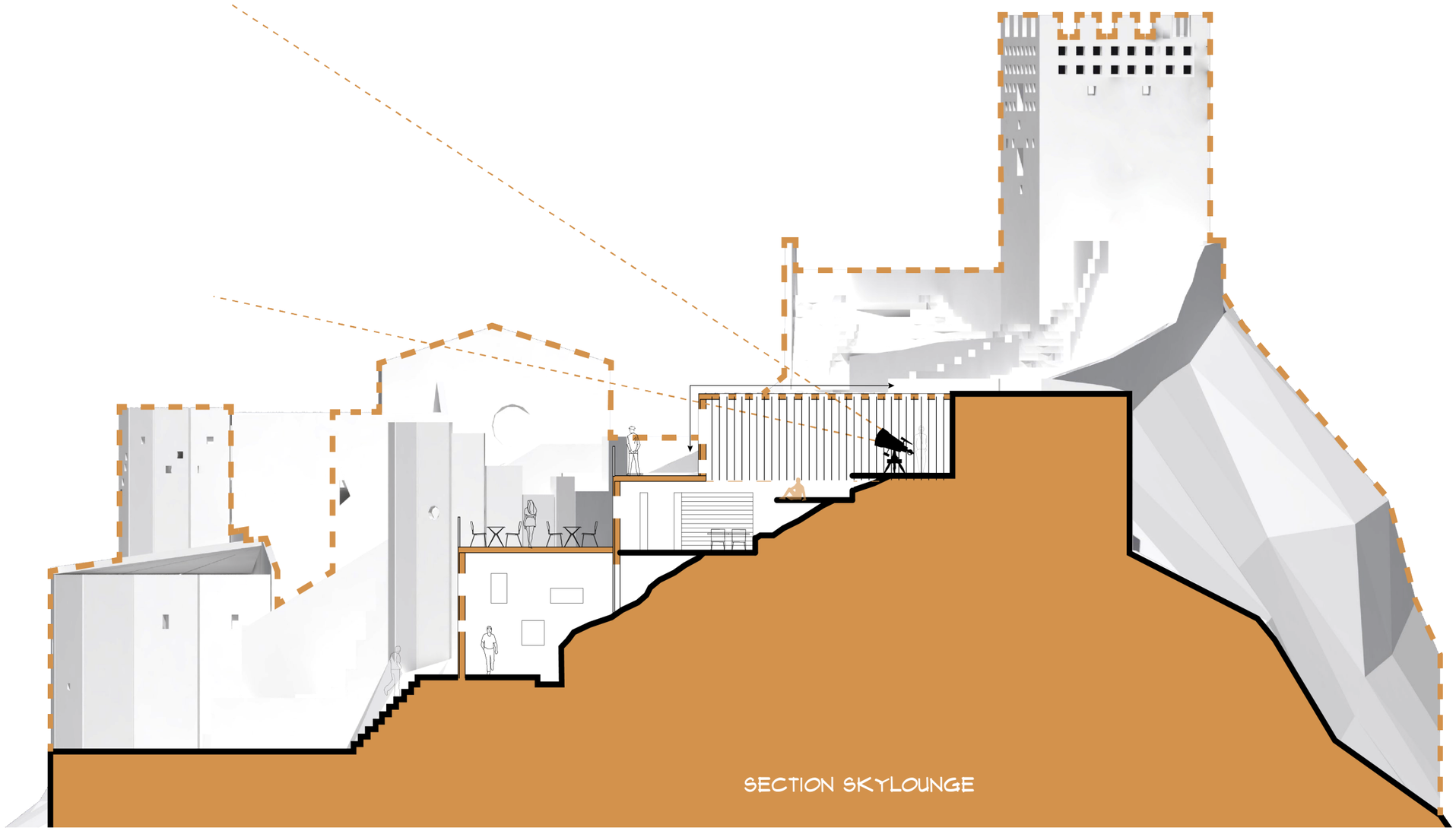
INTERIOR



FIRST FLOOR



SECOND FLOOR



SECTION SKYLOUNGE

ENTRY PERSPECTIVE

CLIMATE:

TEMPERATURE RANGE
California Energy Code

LOCATION: **Pescara, –, ITA**
Latitude/Longitude: 42.85° North, 14.2° East, **Time Zone from Greenwich** 1
Data Source: IGDG 162300 WMO Station Number, **Elevation** 16 m

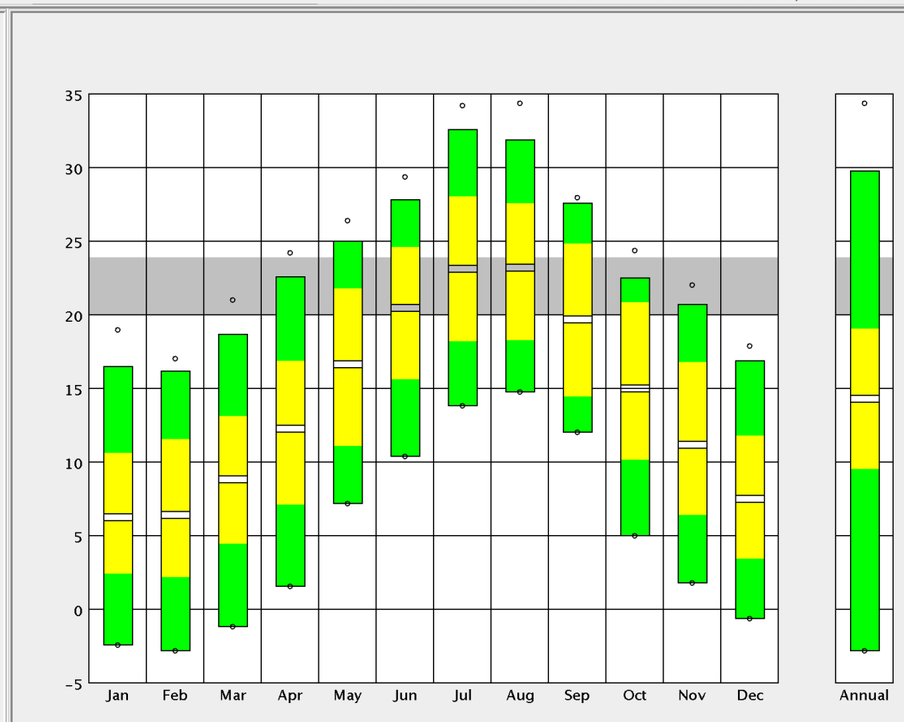
LEGEND

RECORDED HIGH –
DESIGN HIGH –
AVERAGE HIGH –
MEAN –
AVERAGE LOW –
DESIGN LOW –
RECORDED LOW –
COMFORT ZONE

DESIGN HIGH: Residential
- 1% of Hours Above
- .5% of Hours Above
- 0% of Hours Above

DESIGN LOW: Residential
- 1% of Hours Below
- .5% of Hours Below
- 0% of Hours Below

TEMPERATURE RANGE:
- –10 to 40 °C
- Fit to Data

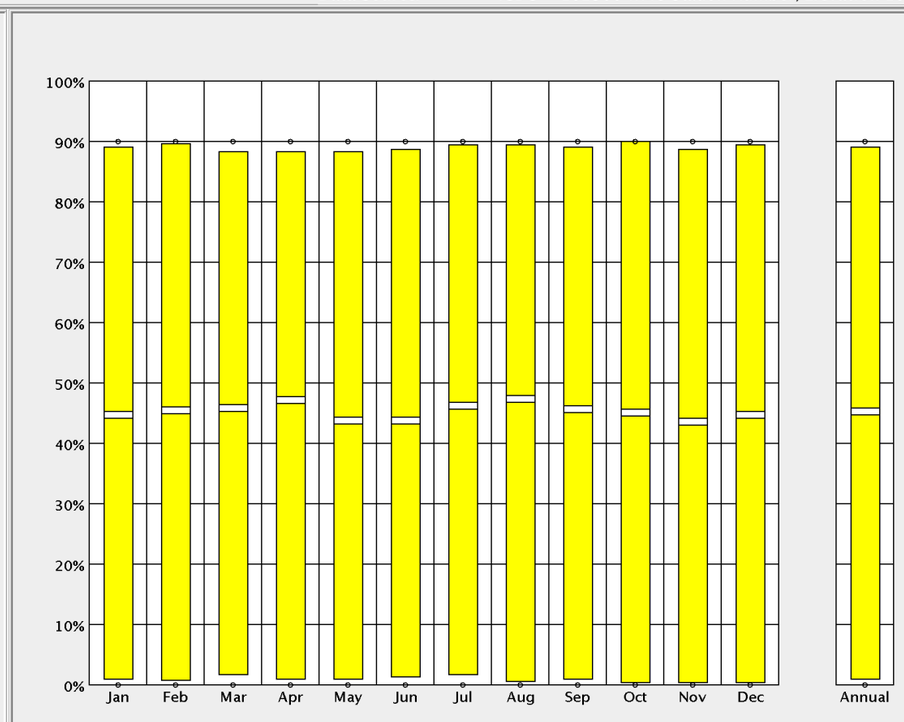


SKY COVER RANGE

LOCATION: **Pescara, –, ITA**
Latitude/Longitude: 42.85° North, 14.2° East, **Time Zone from Greenwich** 1
Data Source: IGDG 162300 WMO Station Number, **Elevation** 16 m

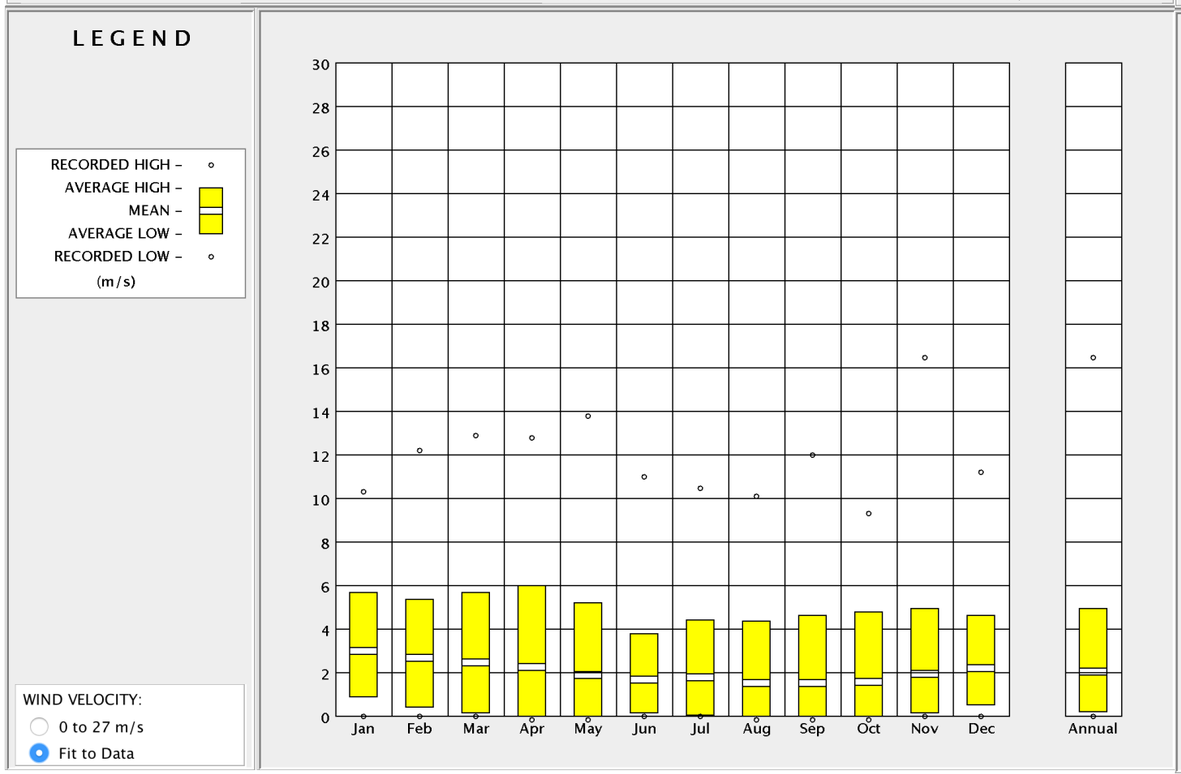
LEGEND

Total Cloud Cover 100%
RECORDED HIGH –
AVERAGE HIGH –
MEAN –
AVERAGE LOW –
RECORDED LOW –
Clear Skies 0



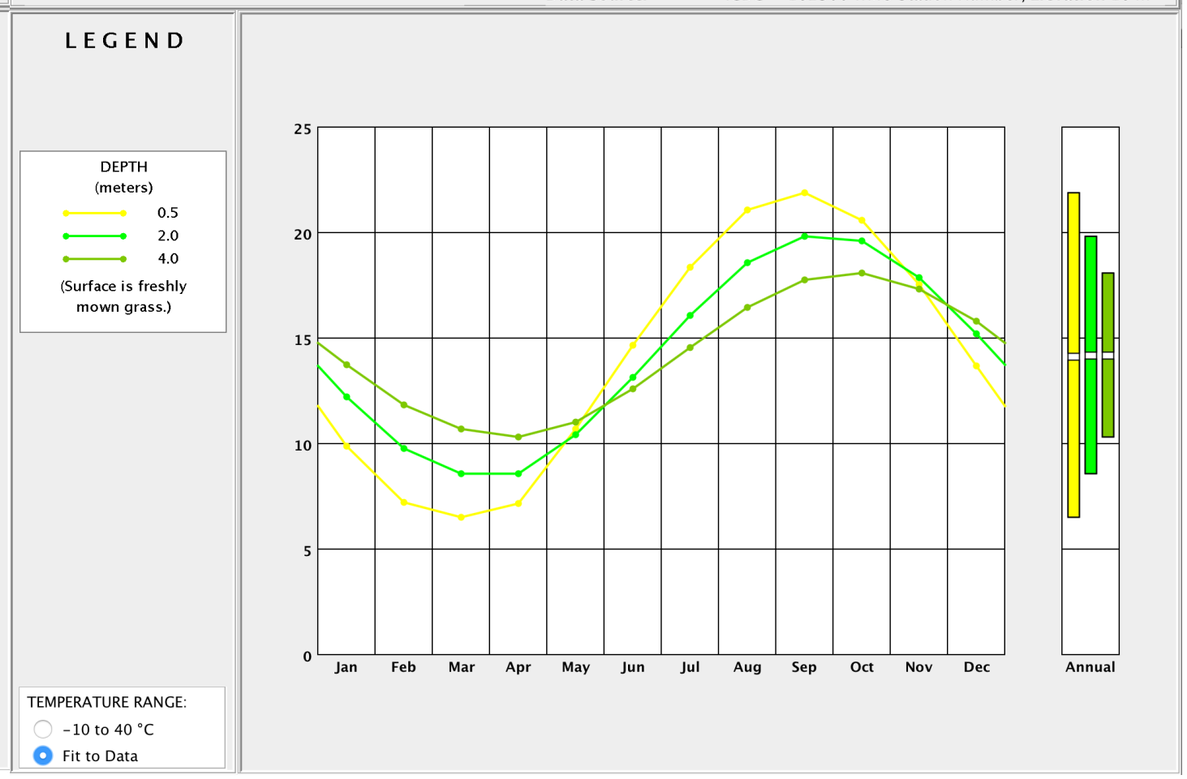
WIND VELOCITY RANGE

LOCATION: **Pescara, –, ITA**
Latitude/Longitude: 42.85° North, 14.2° East, **Time Zone from Greenwich** 1
Data Source: IGDG 162300 WMO Station Number, **Elevation** 16 m



GROUND TEMPERATURE (MONTHLY AVERAGE)

LOCATION: **Pescara, –, ITA**
Latitude/Longitude: 42.85° North, 14.2° East, **Time Zone from Greenwich** 1
Data Source: IGDG 162300 WMO Station Number, **Elevation** 16 m



SUN SHADING CHART

LOCATION: **Pescara, –, ITA**
Latitude/Longitude: 42.85° North, 14.2° East, **Time Zone from Greenwich** 1
Data Source: IGDG 162300 WMO Station Number, **Elevation** 16 m

LEGEND

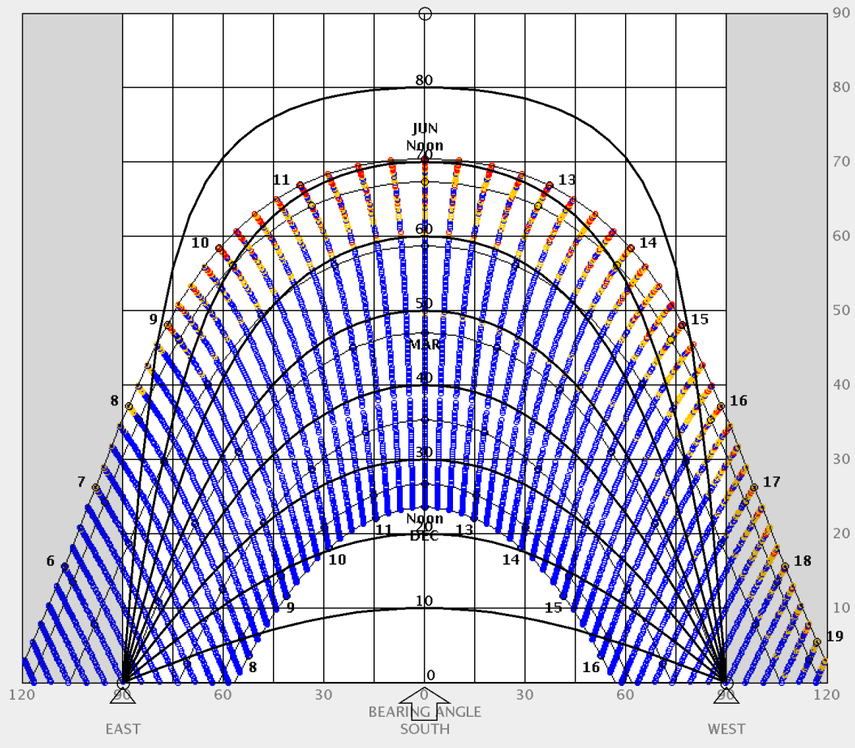
° WARM/HOT > 24°C
(SHADE NEEDED)
160 Hours Exposed
20 Hours Shaded

° COMFORT > 20°C
(SHADE HELPS)
271 Hours Exposed
108 Hours Shaded

° COOL/COLD < 20°C
(SUN NEEDED)
1627 Hours Exposed
322 Hours Shaded

PLOT MONTHS:
WINTER SPRING
(•) December 21 to June 21
SUMMER FALL
( ) June 21 to December 21

[ ] Display Grid
[x] Display Shading Calculator
[ ] Display Obstruction Elevation
Input Obstructions



SUN SHADING CHART

LOCATION: **Pescara, –, ITA**
Latitude/Longitude: 42.85° North, 14.2° East, **Time Zone from Greenwich** 1
Data Source: IGDG 162300 WMO Station Number, **Elevation** 16 m

LEGEND

° WARM/HOT > 24°C
(SHADE NEEDED)
717 Hours Exposed
141 Hours Shaded

° COMFORT > 20°C
(SHADE HELPS)
448 Hours Exposed
159 Hours Shaded

° COOL/COLD < 20°C
(SUN NEEDED)
919 Hours Exposed
214 Hours Shaded

PLOT MONTHS:
WINTER SPRING
( ) December 21 to June 21
SUMMER FALL
(•) June 21 to December 21

[ ] Display Grid
[x] Display Shading Calculator
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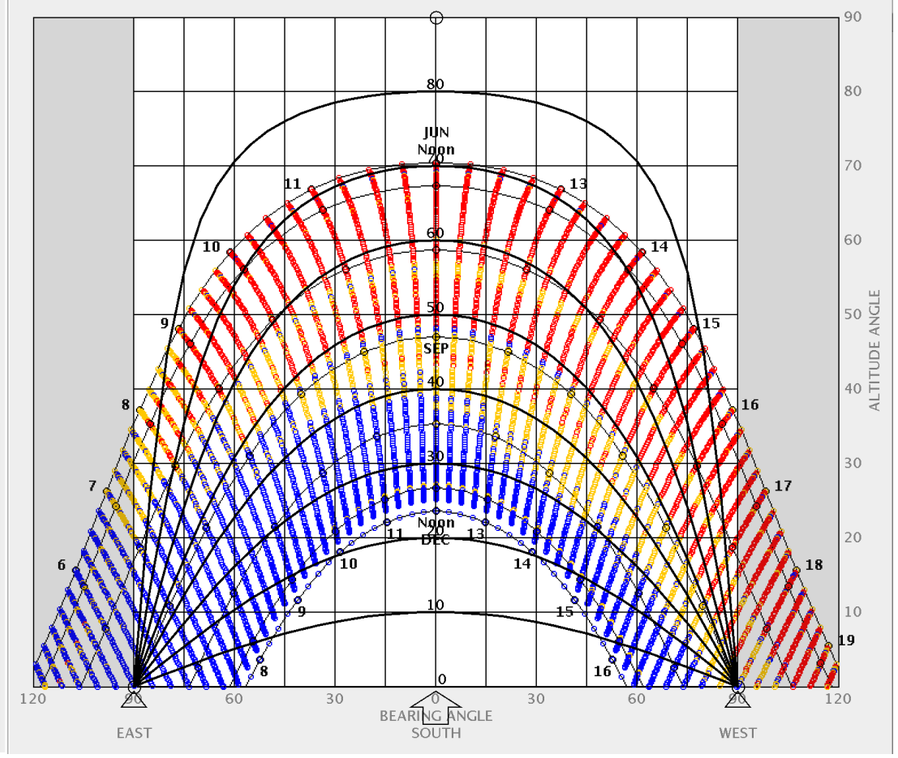
Input Obstructions



TIMETABLE PLOT

LOCATION: **Pescara, -, ITA**
Latitude/Longitude: 42.85° North, 14.2° East, **Time Zone from Greenwich** 1
Data Source: IGDG 162300 WMO Station Number, **Elevation** 16 m

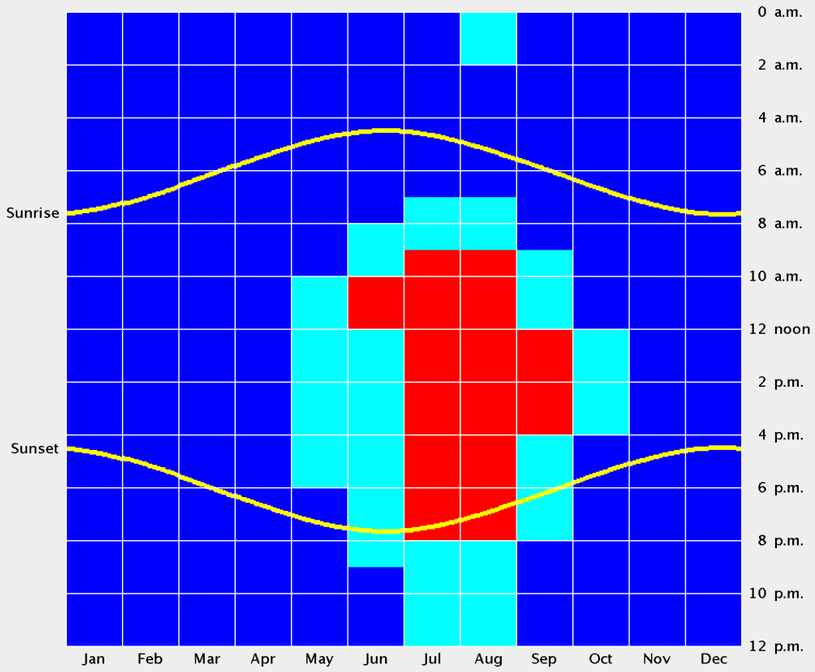
LEGEND

DRY BULB TEMP
(degrees C)

0%	< 0	
75%	0	- 20
15%	20	- 24
10%	24	- 38
0%	> 38	

PLOT: DRY BULB TEMP

Monthly Avg / Daily



PSYCHROMETRIC CHART
California Energy Code

LOCATION: **Pescara, -, ITA**
Latitude/Longitude: 42.85° North, 14.2° East, **Time Zone from Greenwich** 1
Data Source: IGDG 162300 WMO Station Number, **Elevation** 16 m

LEGEND

COMFORT INDOORS
56% COMFORTABLE
44% NOT COMFORTABLE

PLOT: COMFORT INDOORS

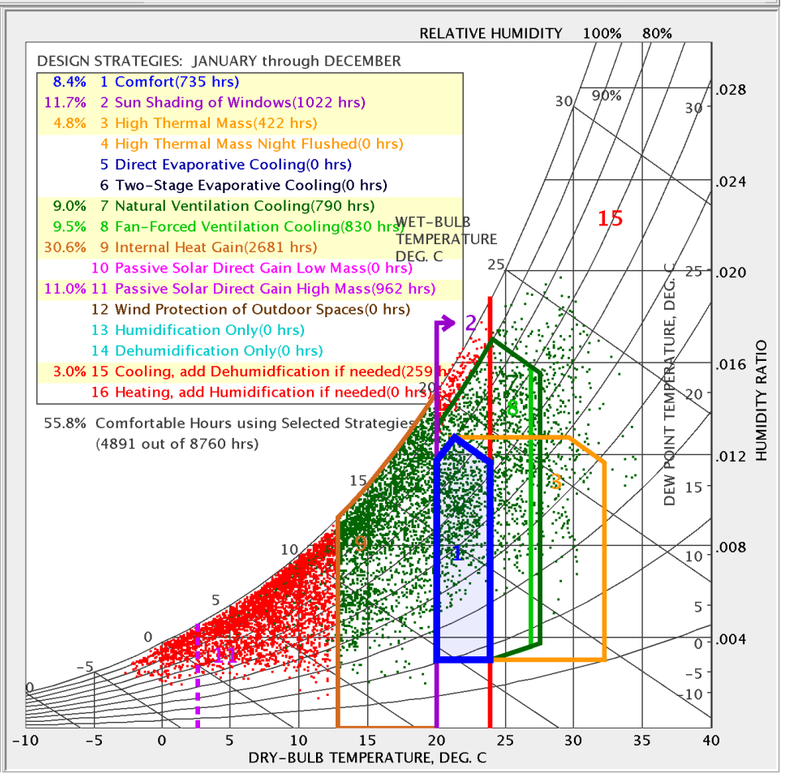
Hourly / Daily Min/Max

All Hours / Select Hours
1 a.m. through 12 a.m.

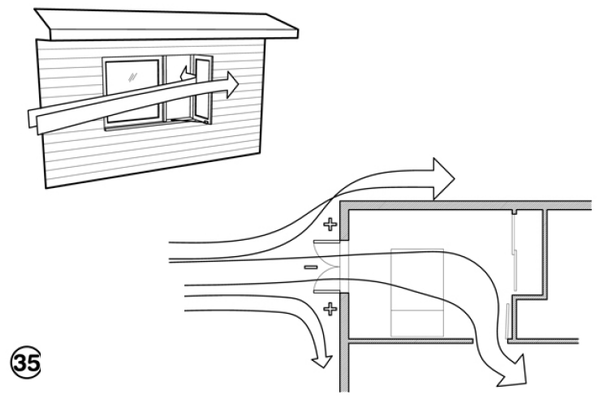
All Months / Select Months
JAN through DEC
1 Month JAN Next
1 Day 1 Next
1 Hour 1 a.m. Next

TEMPERATURE RANGE:
-10 to 40 °C / Fit to Data

Display Design Strategies
Show Best set of Design Strategies



CLIMATE CONCLUSION:



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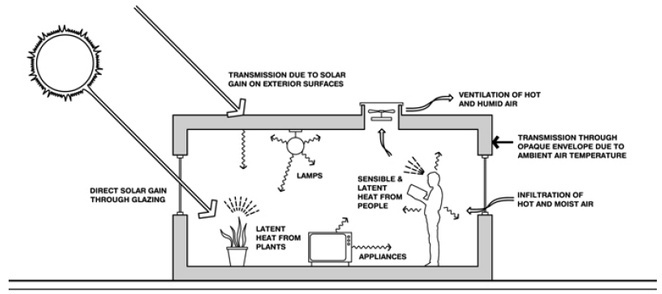
Good natural ventilation can reduce or eliminate air conditioning in warm weather, if windows are well shaded and oriented to prevailing breezes



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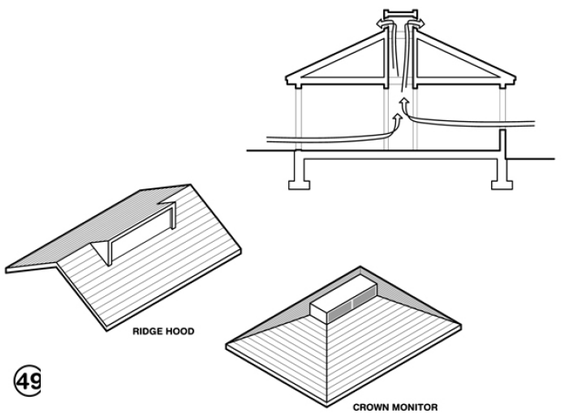
Heat gain from lights, people, and equipment greatly reduces heating needs so keep home tight, well insulated (to lower Balance Point temperature)



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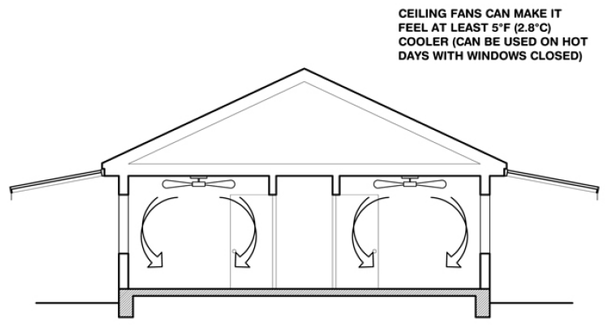
To produce stack ventilation, even when wind speeds are low, maximize vertical height between air inlet and outlet (open stairwells, two story spaces, roof monitors)



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On hot days ceiling fans or indoor air motion can make it seem cooler by 5 degrees F (2.8C) or more, thus less air conditioning is needed

SUSTAINABILITY:

ROAD TO A ZERO ENERGY BUILDING

BUILDINGS CONSUME APPROXIMATELY 40% OF THE ENERGY PRODUCED, MORE THAN ANY OTHER SECTOR. AS BUILDING OWNERS AND DESIGNERS, WE ARE CHALLENGED TO FIND SUSTAINABLE SOLUTIONS TO REDUCE BUILDING ENERGY CONSUMPTION. OUR TEAM IS COMMITTED TO THIS CHALLENGE, AND WE UNDERSTAND THE REQUIRED EFFORT TO REACH THE GOAL OF A ZERO ENERGY BUILDING (ZEB). A ZEB HAS A NET ZERO ENERGY CONSUMPTION ANNUALLY, AND ACHIEVING A ZEB BEGINS BY EVALUATING THE PROGRAM AND THE SITE TO MINIMIZE THE BUILDING LOAD AS MUCH AS POSSIBLE, THEN USING ENERGY EFFICIENT TECHNOLOGIES TO MEET THE NEEDS OF THE BUILDING. FINALLY, ON-SITE RENEWABLE ENERGY SOURCES ARE USED TO OFFSET THE BUILDING ENERGY CONSUMPTION.

1. REDUCE BUILDING LOAD

THE BEST WAY TO SAVE ENERGY IS TO TURN IT OFF, WHETHER IT IS LIGHTS, COMPUTERS OR AIR CONDITIONING. THE NEXT BEST SOLUTION IS TO LIMIT THE AMOUNT OF NEED FOR ENERGY CONSUMING COMPONENTS. FOR A BUILDING, THIS MEANS MAKING IMPORTANT DESIGN DECISIONS THAT HELP REDUCE THE OVERALL BUILDING LOAD, WHICH TRANSLATES INTO ENERGY SAVINGS. IT STARTS BY EMBRACING THE SITE ATTRIBUTES TO SHAPE AND POSITION THE BUILDING ON THE SITE.

ANOTHER AREA TO REDUCE LOAD IS BY IMPROVING THE BUILDING ENVELOPE AND INCREASING INSULATION VALUES ABOVE AND BEYOND THE ASHRAE MINIMUM REQUIREMENTS. OTHER BUILDING ENVELOPE ATTRIBUTES COULD INCLUDE MOVABLE BUILDING COMPONENTS THAT SHADE AND INSULATE THE BUILDING DEPENDING ON CLIMATE CONDITIONS, HENCE ALLOWING THE BUILDING TO OPEN UP AND BREATHE WHEN COOLING IS DESIRABLE OR SHUT OFF AND RETAIN ALL OF THE HEAT WHEN NEEDED.

BUILDING LOADS ALSO COME FROM INTERNAL LOADS SUCH AS PEOPLE, LIGHTS AND EQUIPMENT. PEOPLE ADD HEAT TO THE SPACE AND ALSO REQUIRE VENTILATION. IN THE SUMMER MONTHS, BUT TAKING ADVANTAGE OF NATURAL VENTILATION CAN REDUCE OR POSSIBLY ELIMINATE THIS COOLING LOAD USING DEMAND CONTROLLED VENTILATION CAN REDUCE THE VENTILATION LOAD EVEN FURTHER BY ONLY PROVIDING THE AMOUNT OF VENTILATION NEEDED TO SUIT THE OCCUPIED CONDITIONS.

THROUGH EFFICIENT LIGHTING DESIGN, DAYLIGHT HARVESTING, OCCUPANCY SENSORS AND PLUG LOAD MANAGEMENT, THE LIGHTING AND EQUIPMENT LOAD COULD BE REDUCED BY 20% - 40%.

2.USE ENERGY EFFICIENT TECHNOLOGIES:

USING A GROUND COUPLED GEOTHERMAL SYSTEM TO COOL AND HEAT THE VENTILATION AIR WILL ALLOW FOR HIGHER EFFICIENCIES THAN NORMALLY ACHIEVED BY AIR-TO-AIR HEAT PUMP SYSTEMS.
IN CONCERT WITH THE GEOTHERMAL SYSTEM, THE BUILDINGS WILL BE HEATED AND/OR COOLED WITH A RADIANT FLOOR SYSTEM TO ALLOW FOR EXHIBIT FLEXIBILITY AND IMPROVED OCCUPANT COMFORT. THE SUPPLEMENTAL DISPLACEMENT AIR SYSTEM WILL COMPLEMENT THE RADIANT FLOOR BY ALLOWING FOR THE SYSTEM TO REACT QUICKER TO LOAD VARIATIONS.
LOW- FLOW AND HIGH EFFICIENCY PLUMBING FIXTURES WILL BE USED TO ACHIEVE WATER EFFICIENCY GOALS. RAIN WATER WILL BE HARVESTED AND STORED IN TANKS ON SITE TO PROVIDE RENEWABLE WATER SOURCE.

3. THE EARTH AS RENEWABLE ENERGY

ANOTHER OFTEN UNTAPPED ENERGY SOURCE IS THE EARTH ITSELF. THROUGH A CLOSED LOOP GEOTHERMAL SYSTEM WITH DEEP WELLS, THE BUILDING WILL BE ABLE TO USE THE GROUND AS A SOURCE TO TRANSFER HEAT.

THANK YOU

ARCHI - SENSES

ALAA BOU GHANEM
NIZAR ZEITOUNY
NADINE MALAEB
CARLA KOUKACHE