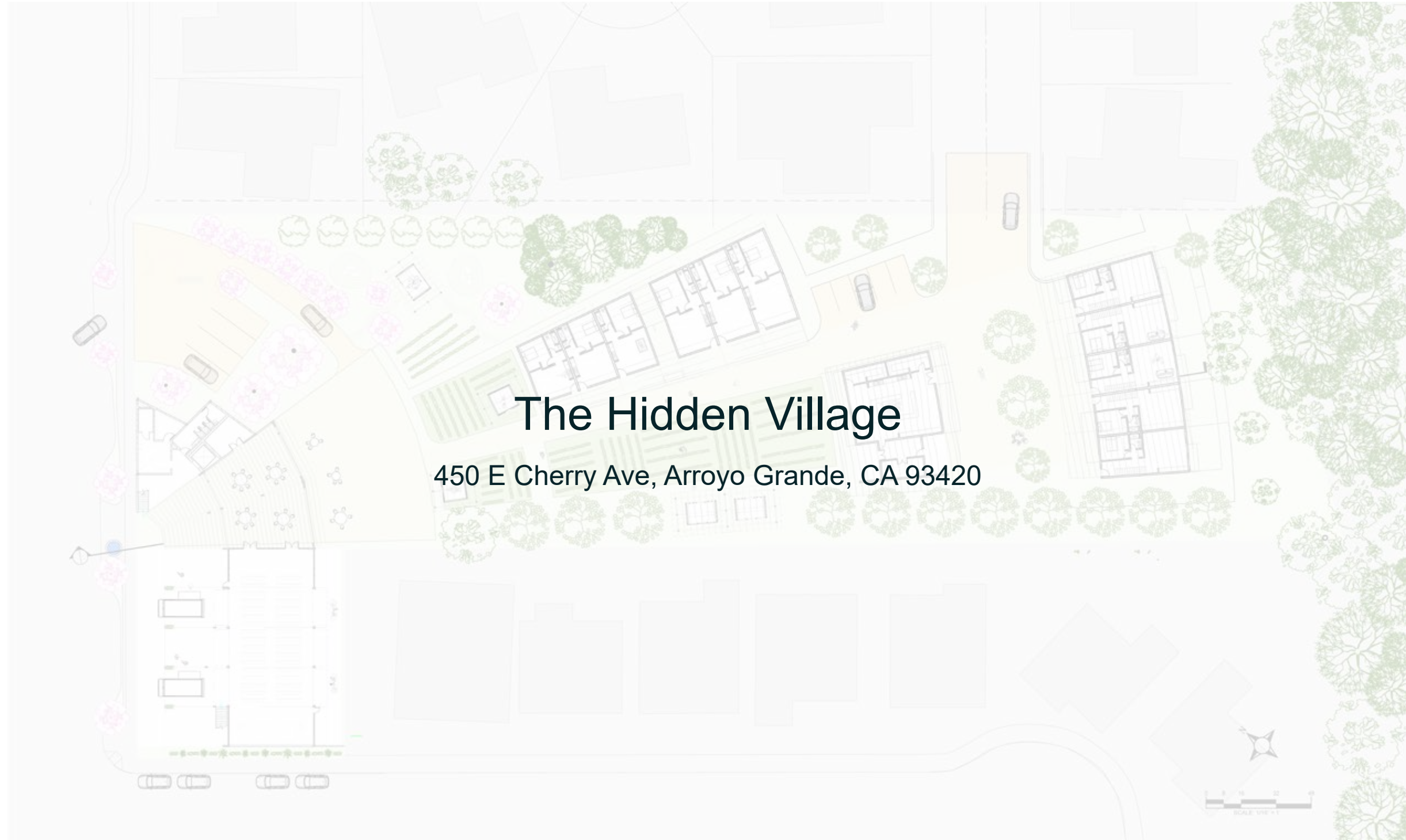


CALIFORNIA COLLEGE OF THE ARTS
ARCHITECTURE DIVISION
FA23 INTEGRATED STUDIO
 Arjay Jimenez, David Locon, Henry Asare



Arroyo Grande
Village

**BENJAMIN
MOORE FUTURE
OF DESIGN
CHALLENGE**

Fall 2023
ReGeneration
Studio

Instructors:
Margaret Ikeda
Evan Jones

Team:
Arjay Jimenez
David Locon
Henry Asare

Date:
January 10, 2024

SYMBOLS

01

DWG TITLE

SCALE: XX" = 1'-0"

SOURCE: CITATION & PAGE

Drawing Label

N

North Arrow

xx

Ax.x

Elevation No

Sheet No

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Ax.x

Section No

Sheet No

xx

Ax.x

Detail No

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01

Column Grid

Break Line

xx

Image Reference Point

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A 0.0 PROJECT INTRODUCTION



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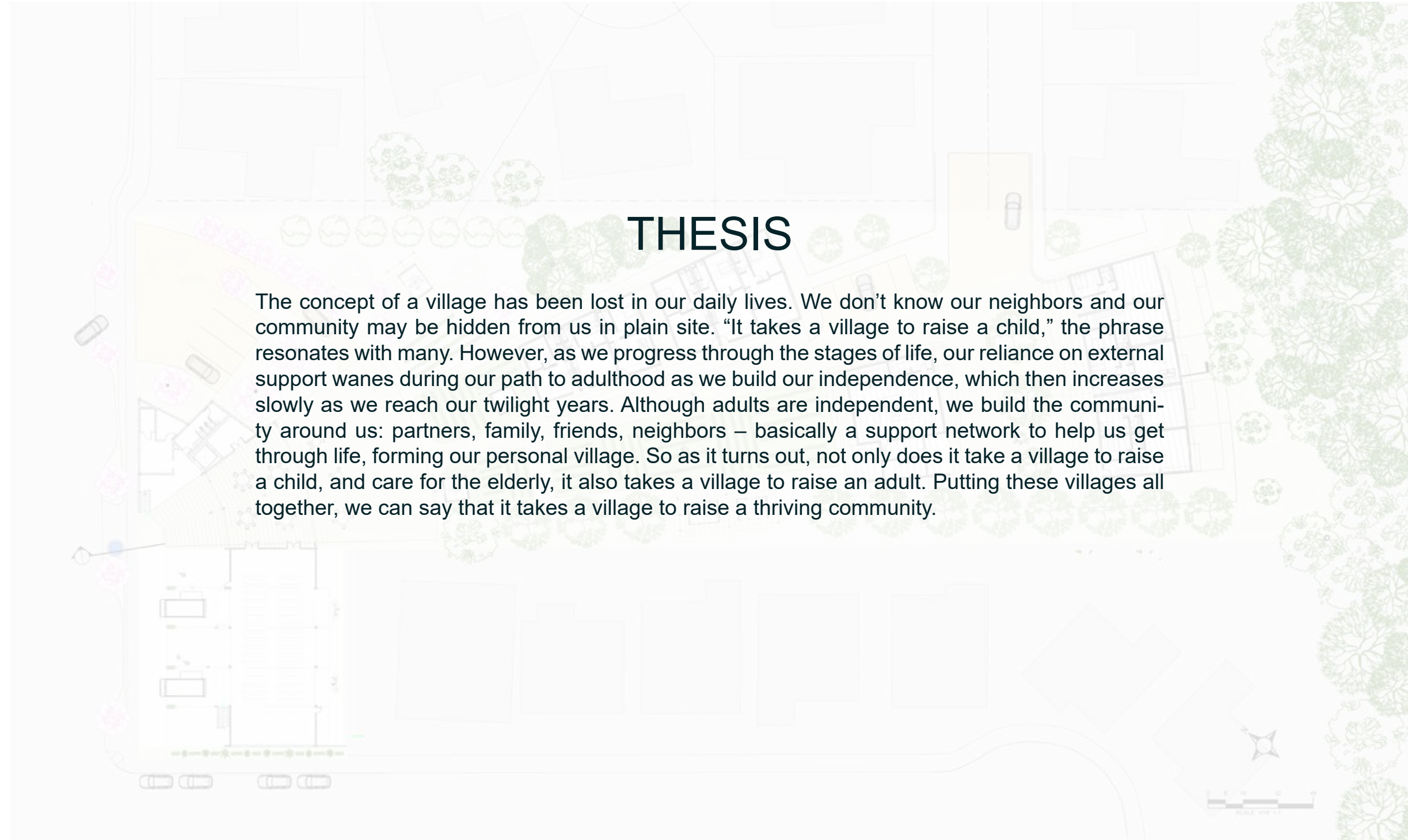
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**A0.0
PROJECT
INTRODUCTION**



THESIS

The concept of a village has been lost in our daily lives. We don't know our neighbors and our community may be hidden from us in plain site. "It takes a village to raise a child," the phrase resonates with many. However, as we progress through the stages of life, our reliance on external support wanes during our path to adulthood as we build our independence, which then increases slowly as we reach our twilight years. Although adults are independent, we build the community around us: partners, family, friends, neighbors – basically a support network to help us get through life, forming our personal village. So as it turns out, not only does it take a village to raise a child, and care for the elderly, it also takes a village to raise an adult. Putting these villages all together, we can say that it takes a village to raise a thriving community.



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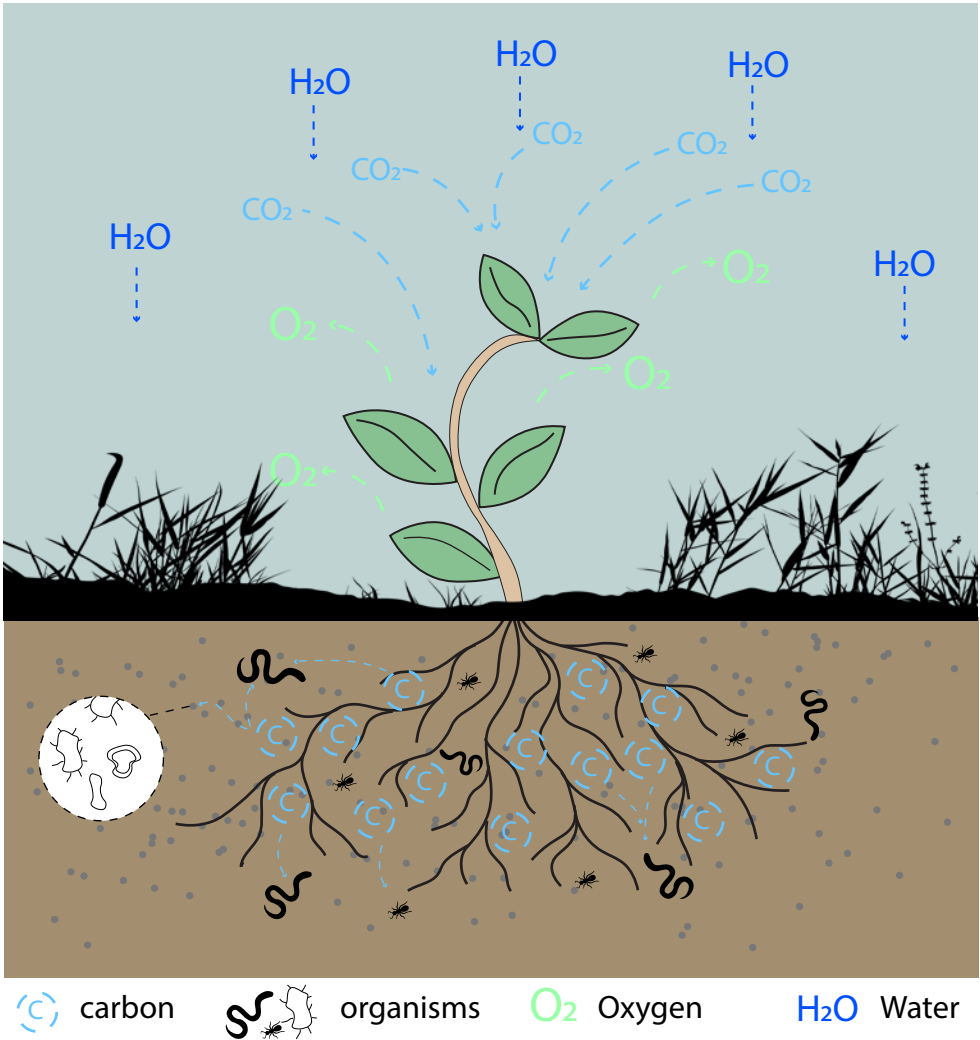
A0.1
Thesis

Air

- We pollute our air with pesticides to get rid of insects, but we end up affecting ourselves as well.
- Chemicals used seeps into the soil.
- In normal farming practices, carbon dioxide is released into the air en masse as farmers begin to till their fields, then gets absorbed again once the plants start to grow as the season progresses.

Land

- A good amount of farmers don't know how to take care of their soil.
- More and more nitrogen is needed to fertilize the soil for new crops.
- Land can actually store more carbon than the air and plants combined.
- Plants take the energy from carbon dioxide and feeds itself, as well as the organisms around it for a cycle of growth.
- With a mixed diversity of crops being grown in the field, as well as animals allowed to pasture, the land becomes rich, able to regenerate soil that might have been lost over the years.
- According to experts, however, if we do not change how we treat our land, desertification of agricultural lands is inevitably coming in the next 60 years.



Regeneration

- Regenerative farming is utilizing ways to recover lost the lost soil and take care of the land that is being used.
- This can be scaled to around two-thirds of the world, but it is up to our governments to encourage people to do it.
- Takes a lot of planning, but keeps the land green and naturally fertilizes it from the roaming livestock.

Water

- Multiculture of crops allow the water to be absorbed into the soil more than tilled fields where it just runs.
- 60% of rain water is from the ocean, the other 40% comes from the inland, part of which comes from plants



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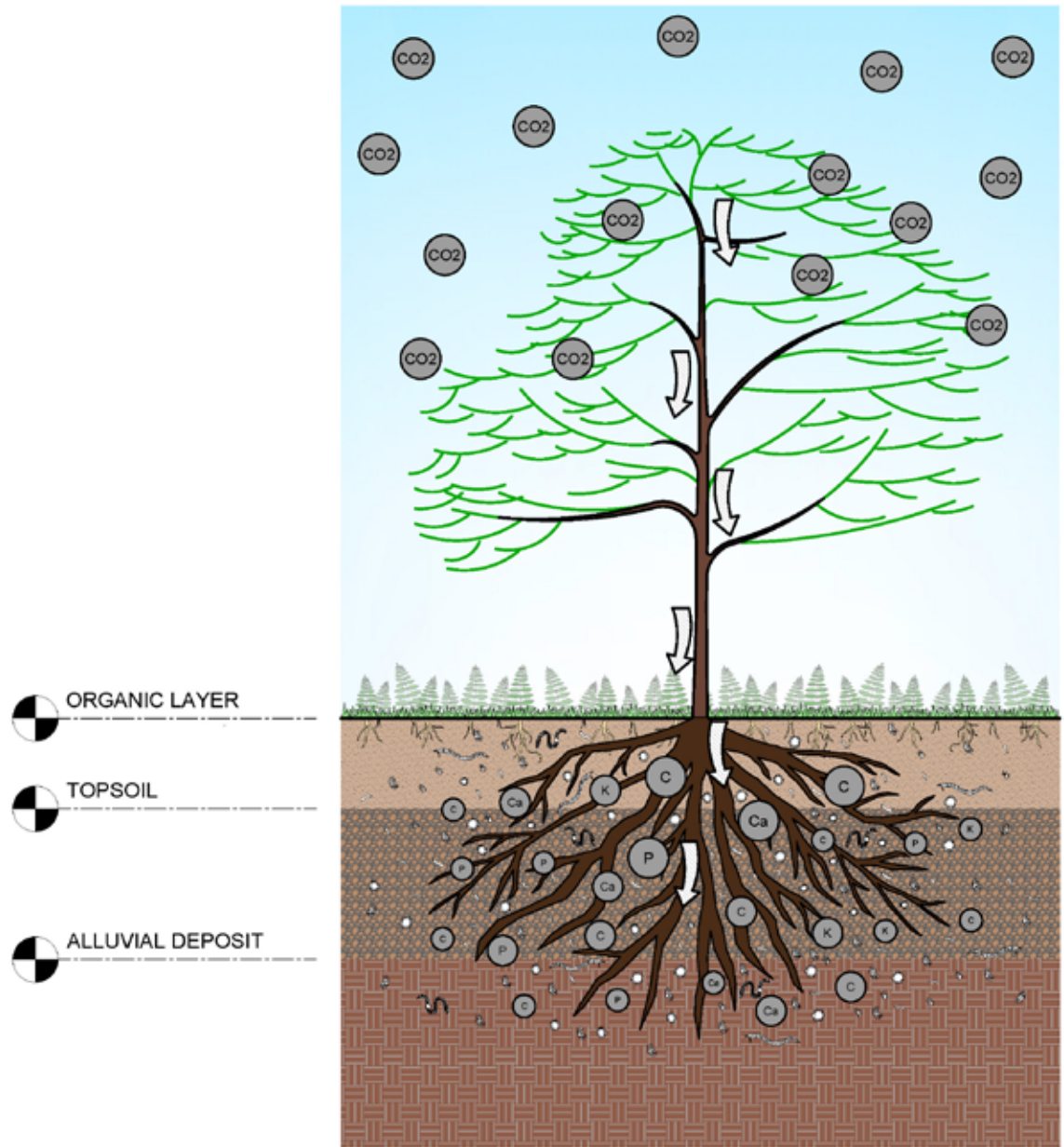
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**A1.1.1
SOIL**

ALLUVIAL SOIL

- ALLUVIAL SOIL IS COMPILED OF SEDIMENTS DEPOSITED BY RIVERS, STREAMS, AND OTHER BODIES OF WATER.
- ALLUVIAL SOIL CAN COME IN DIFFERENT FORMS OF TEXTURE SUCH AS:
 - 1) **SANDY ALLUVIAL SOIL** WHICH IS COARSE AND VERY POROUS BECAUSE IT IS MOSTLY MADE UP OF SAND-SIZED PARTICLES. THEY ARE COMMONLY FOUND AROUND RIVER MOUTHS OR IN PLACES WITH HIGH WATER TABLES.
 - 2) **SILTY ALLUVIAL SOIL** WHICH IS COMPOSED PRIMARILY OF SILT-SIZED PARTICLES, GIVING IT A SMOOTH, FINE FEEL. SINCE THE TINY PARTICLES STORE WATER AND NUTRIENTS MORE EFFICIENTLY, IT IS FREQUENTLY MORE FERTILE THAN SANDY ALLUVIAL SOIL. SILTY ALLUVIAL SOIL IS FREQUENT IN FLOOD PLAINS AND OTHER REGIONS WHERE SLOW-MOVING WATER DEPOSITS SILT.
 - 3) **CLAYEY ALLUVIAL SOIL** IS CONSIDERED A THICK AND SLOW-DRAINING SINCE IT IS MOSTLY MADE UP OF CLAY-SIZED PARTICLES. SINCE THE TINY PARTICLES MIGHT HINDER ROOT DEVELOPMENT AND WATER PENETRATION, IT IS FREQUENTLY LESS PRODUCTIVE THAN SANDY OR SILTY ALLUVIAL SOIL. CLAYEY ALLUVIAL SOIL IS MAINLY FOUND IN LOCATIONS WHERE THERE ARE STEEP SLOPES OR HEAVY RAINFALL. IN ADDITION, WHERE SEDIMENT IS DEPOSITED BY FLOWING WATER.
- THE SOURCE OF THE SEDIMENT ALSO HAS AN IMPACT ON THE COMPOSITION OF ALLUVIAL SOIL. FOR INSTANCE, THE DEPOSITION OF CERTAIN SEDIMENTS CAN PRODUCE SOIL RICH IN MINERALS SUCH AS POTASSIUM, PHOSPHORUS, AND CALCIUM.
- IN ADDITION TO ITS USE IN AGRICULTURE, IT HAS A NUMBER OF OTHER IMPORTANT PURPOSES. IT IS OFTEN USED IN THE CONSTRUCTION OF ROADS AND BUILDINGS, AND IT IS ALSO USED IN THE PRODUCTION OF BRICKS AND OTHER BUILDING MATERIALS. HOWEVER, THE HIGH FERTILITY OF IT MAKES IT MORE SUITABLE FOR USE IN LANDSCAPING AND HORTICULTURE.
- ONE OF THE MAIN CONCERNS IS THE POTENTIAL FOR SOIL EROSION, WHICH CAN OCCUR WHEN THE SOIL IS NOT PROPERLY MANAGED OR PROTECTED. SOIL EROSION CAN LEAD TO THE LOSS OF VALUABLE TOPSOIL, WHICH CAN NEGATIVELY IMPACT AGRICULTURAL PRODUCTION AND THE OVERALL HEALTH OF THE ECOSYSTEM. IN ADDITION, THE OVERUSE OF ALLUVIAL SOIL FOR AGRICULTURE CAN LEAD TO SOIL DEGRADATION, WHICH CAN REDUCE THE SOIL'S FERTILITY AND PRODUCTIVITY OVER TIME. THEREFORE, PROPER MANAGEMENT OF ALLUVIAL SOIL IS ESSENTIAL IN ORDER TO ENSURE ITS CONTINUED PRODUCTIVITY AND SUSTAINABILITY. THIS INCLUDES IMPLEMENTING PROPER IRRIGATION AND DRAINAGE SYSTEMS, AS WELL AS SOIL CONSERVATION MEASURES SUCH AS TERRACING AND THE USE OF COVER CROPS. IT IS ALSO IMPORTANT TO CONSIDER THE TYPE OF CROPS BEING GROWN AND THE CLIMATE AND TOPOGRAPHY OF THE REGION WHEN MANAGING IT.
- CLIMATE EXAMPLES:
 - 1) IN COLD CLIMATES WITH PERMAFROST, CRYOTURBATION CAN DISRUPT STRATIFICATION OF ALLUVIAL LAYERS.
 - 2) IN WARMER CLIMATES, THE AVAILABLE PRECIPITATION INFLUENCES THE RESULTING SOIL PROPERTIES.
 - 3) IN HUMID CLIMATES, ALLUVIAL SOILS ARE COMMONLY LEACHED.
- IN CONCLUSION, ALLUVIAL SOIL IS A TYPE OF SOIL THAT IS FORMED BY THE DEPOSIT OF SEDIMENT, USUALLY BY A RIVER OR OTHER BODY OF WATER. IT IS KNOWN FOR ITS HIGH FERTILITY AND IS WIDELY USED FOR AGRICULTURE, AS WELL AS IN THE CONSTRUCTION OF ROADS AND BUILDINGS. PROPER MANAGEMENT AND CONSERVATION ARE ESSENTIAL IN ORDER TO ENSURE ITS CONTINUED PRODUCTIVITY AND SUSTAINABILITY.





Arroyo Grande Village

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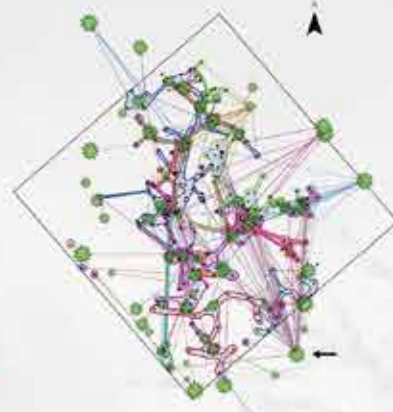
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A1.1.2
SOIL

5 Core Principles of REGENERATIVE AGRICULTURE



Biosequestration also helps the plants/soil to use carbon to bind with hydrogen component (H_2) of water to produce sugar that feed the microbes to provide nutrients to the plants through structural systems such as mycelial networks. These networks are produced by fungi that create spores and helps break rocks and digest pollutants to create flourishing soils like alluvial soil.



A map of a tree roots and shared mycorrhizal fungal network.
Source: Boller et al. 2009.

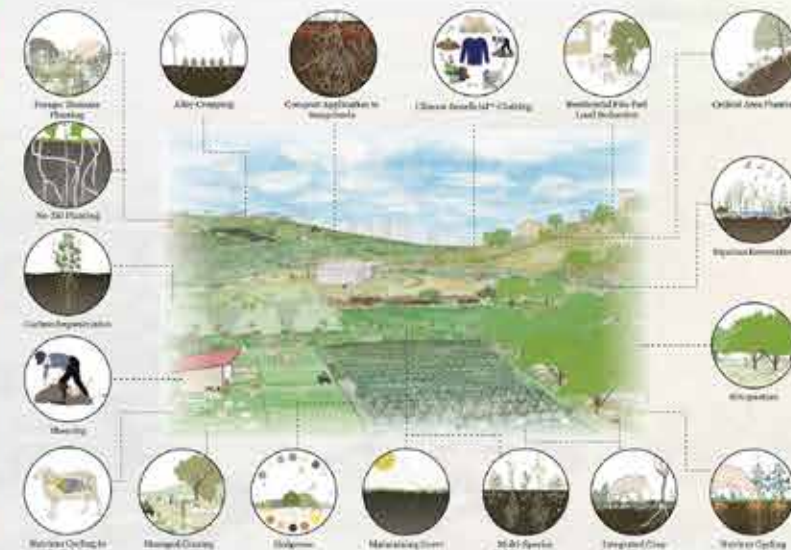
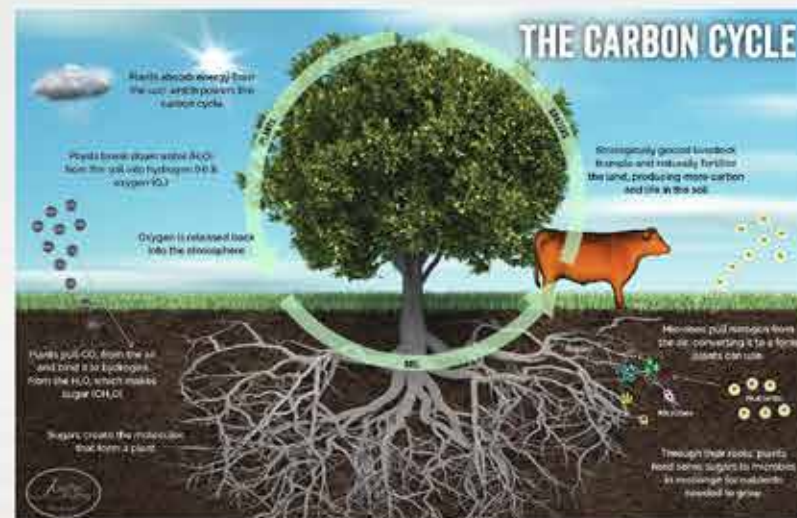


Structure of Mycelium

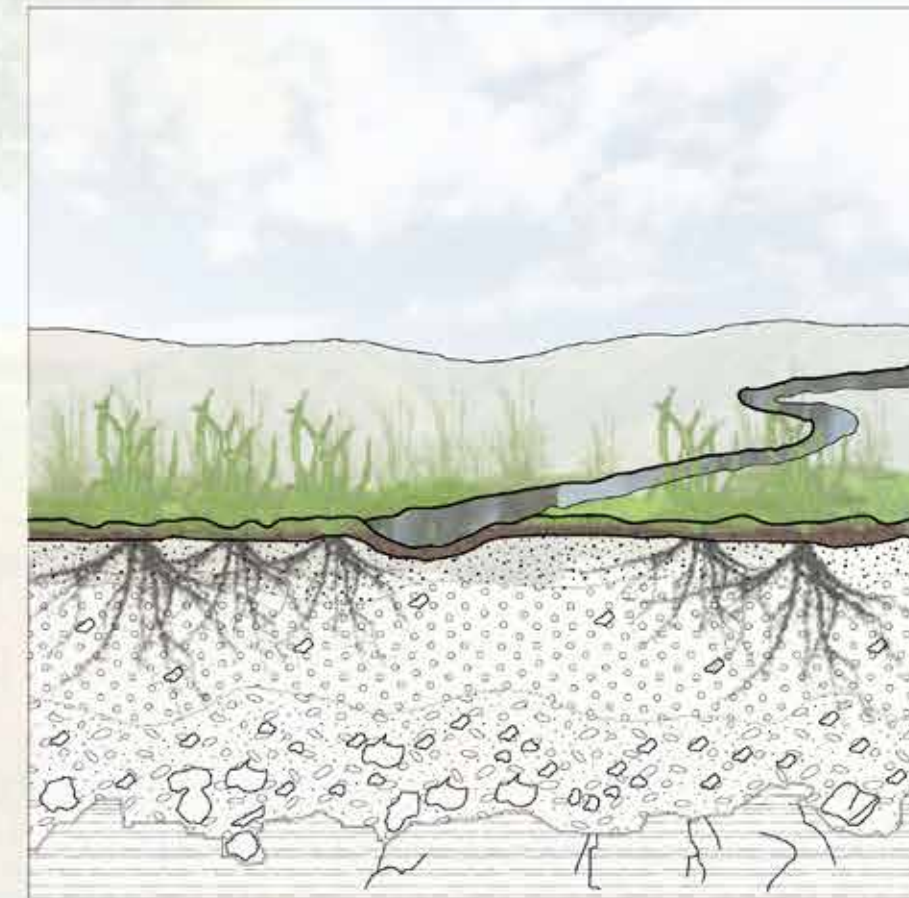
BIO-SEQUERATON

In 2022, 36.8 million $GtCO_2$ was released into the atmosphere - a catastrophic phenomenon that leads to the extinction of nature's resources. This phenomenon has an imbalance in the carbon cycle. The high concentration of Carbon dioxide (CO_2) in the atmosphere requires a new and innovative approach in improving carbon recycling in order to save the planet. This can be achieved through the capture of CO_2 from large point sources and subsequent injection into deep geologic formations for permanent storage, generally referred to as carbon capture and storage (CCS). Thus, bio-sequestration provides a way of creating a healthy climate for the survival of human, animal and plant species.

Biosequestration ensures human's coordination with nature/ earth to capture carbon into the soil through efficient and sustainable agricultural practices. It helps maintain the ecosystem of the soil allowing the earth's micro-organisms/microbes to effectively work to provide plants with the necessary nutrients. These nutrients helps plants use photosynthetic processes to transfer carbon to the soil for storage/sequestration. Biosequestration employs methods and techniques such as regenerative agriculture, no till planting, composting, etc as techniques to enable the soil to capture as much carbon from the atmosphere.



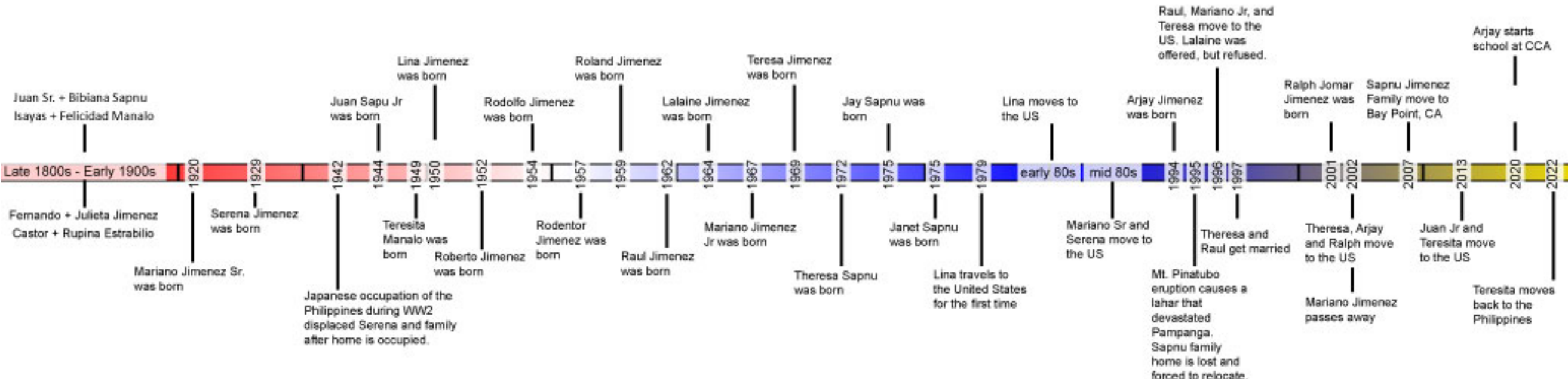
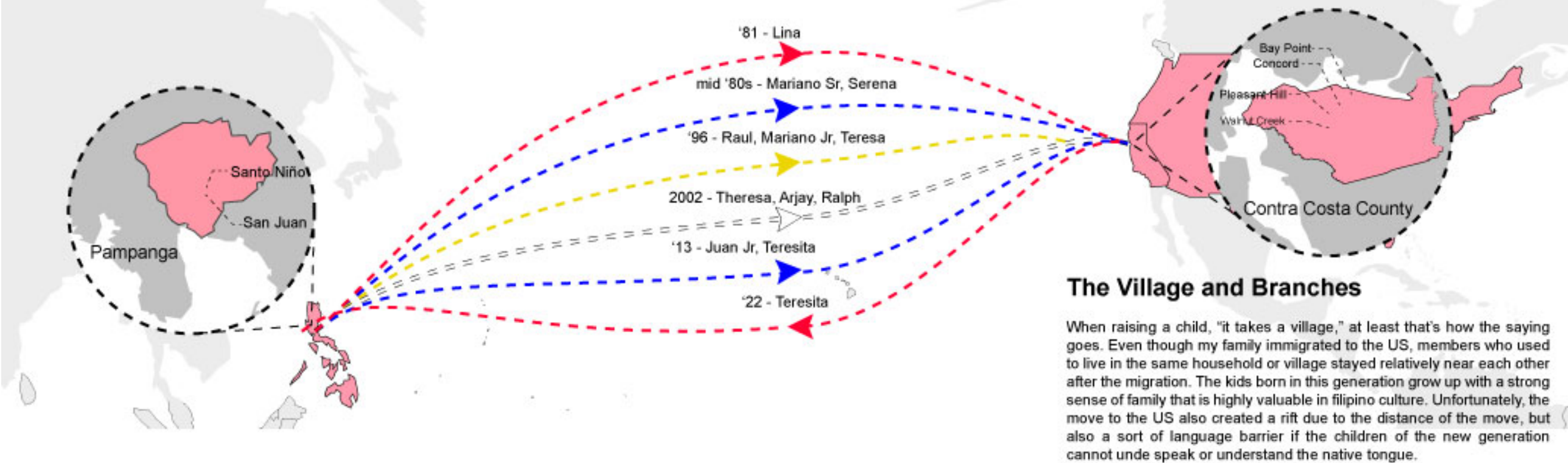
Regenerative Agricultural practices



Cross-section of alluvial soil

Sapnu - Jimenez Family Migration

For generations, the Sapnu - Jimenez Family has been in the Philippine Province of Pampanga, otherwise known as the culinary capital of the Philippines. With the migration starting in the 1980s with Lina Jimenez moving to the United States, a new branch of the respective families has started, with future generations only knowing of their origins, but only going "home" every few years.



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A1.2 CULTURAL HISTORY



LOCON FAMILY:

- RODOLFO LOCON (FATHER) LEFT GUATEMALA IN 1987 TO COME TO SAN FRANCISCO, CA WITH AN UNDECIDED MOTIVE WHETHER TO RETURN TO GUATEMALA OR TO HAVE A LIFE IN THE U.S.

MONTIEL FAMILY:

- MONTIEL GRANDPARENTS WERE BORN AND RAISED IN NICARAGUA. IN THEIR 20s, THEY SPENT A FEW OF YEARS LIVING IN COSTA RICA. IN THEIR 30s, THEY LEFT COSTA RICA TO COME TO START AND RAISE THEIR NEW FAMILY IN SAN FRANCISCO, CA.
- IN 1992, RODOLFO LOCON AND MARIA MONTEL MARRIED IN SAN FRANCISCO, CA.
- IN 1993, THEY HAD THEIR FIRST CHILD, SECOND CHILD IN 1995, AND THIRD CHILD IN 2006.



MONTIEL GRANDPARENTS LEAVE COSTA RICA TO SAN FRANCISCO, CA.

LOCON PARENT LEFT GUATEMALA TO COME TO SAN FRANCISCO, CA.



LEGEND:

- LOCON FAMILY MIGRATION
- MONTIEL FAMILY MIGRATION



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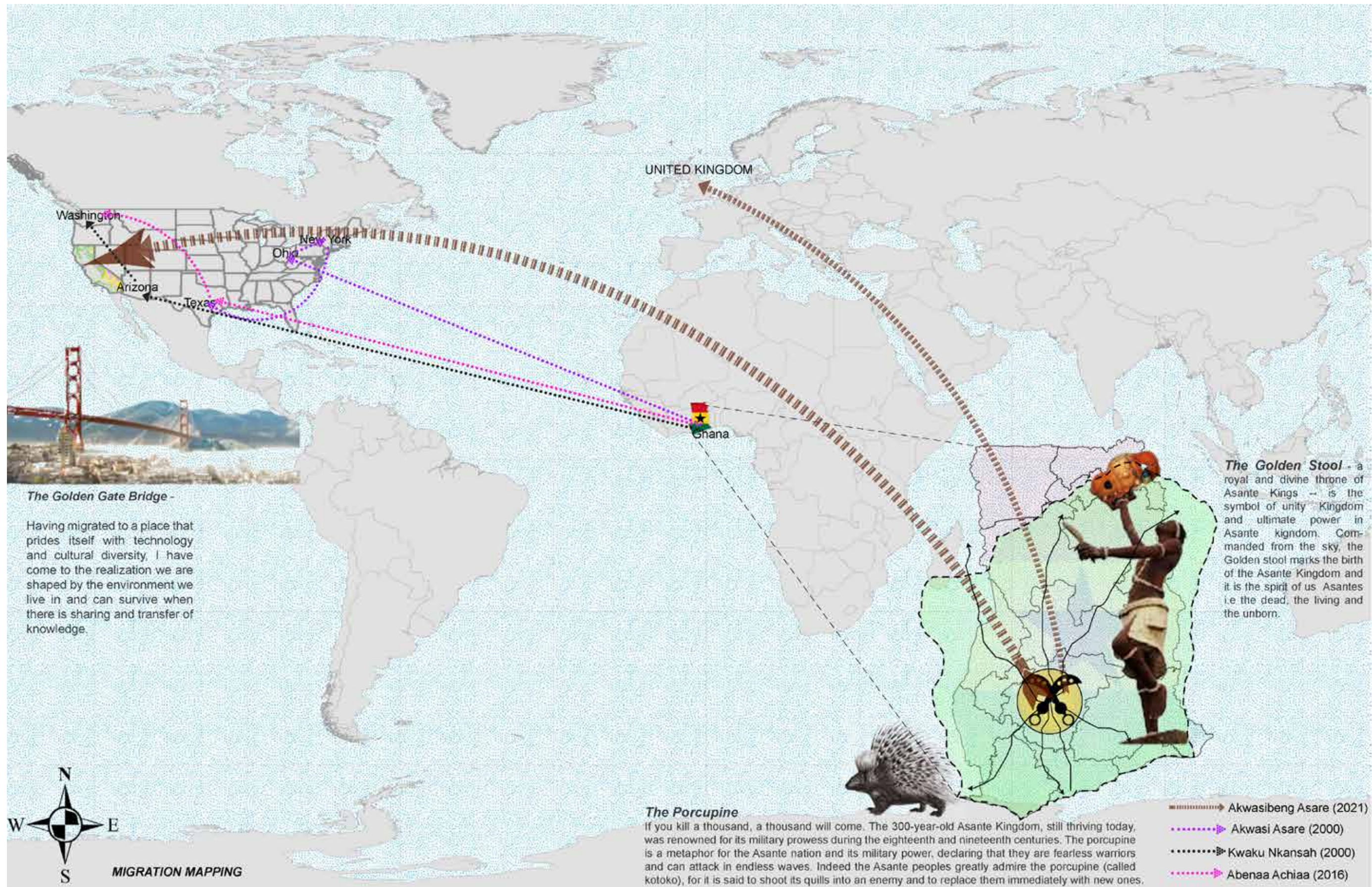
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A1.2.1 CULTURAL HISTORY

Bahay Kubo

The Bahay Kubo, or Nipa Hut, is vernacular farm architecture found in the Philippines. In farming communities, these Kubo would be built with kawayan, or bamboo. During construction, the main structure is typically raised from the ground for farm animals, storage, or used for practicality in the flood prone regions of the Philippines.



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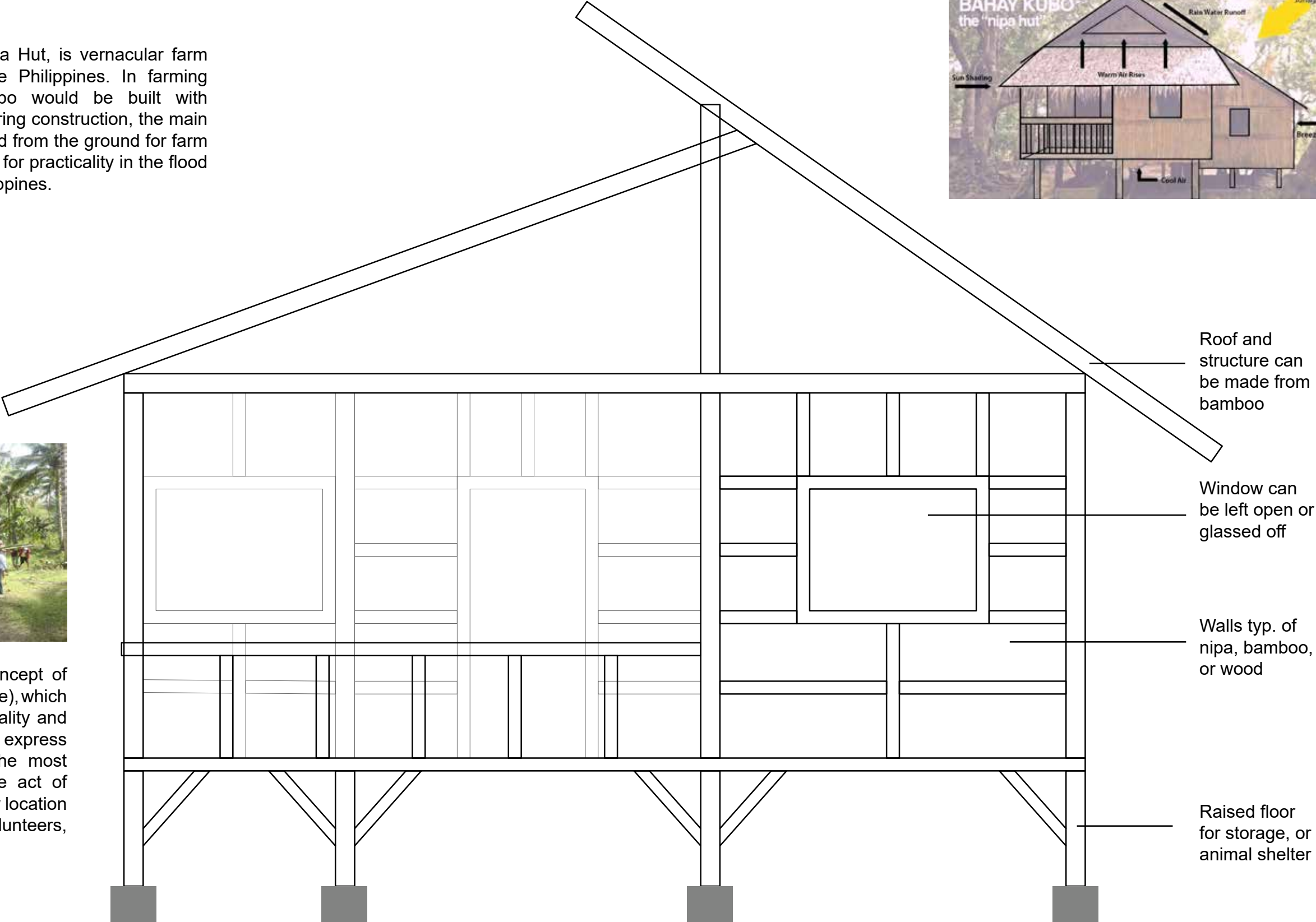
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Shown above is the concept of “bayanihan” (to be a village), which is the word for communality and cooperation. While it can express itself in many forms, the most commonly known is the act of moving a house to a new location with just the help of volunteers, usually your neighbors.





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**A1.3.1
STRUCTURAL
FRAME**

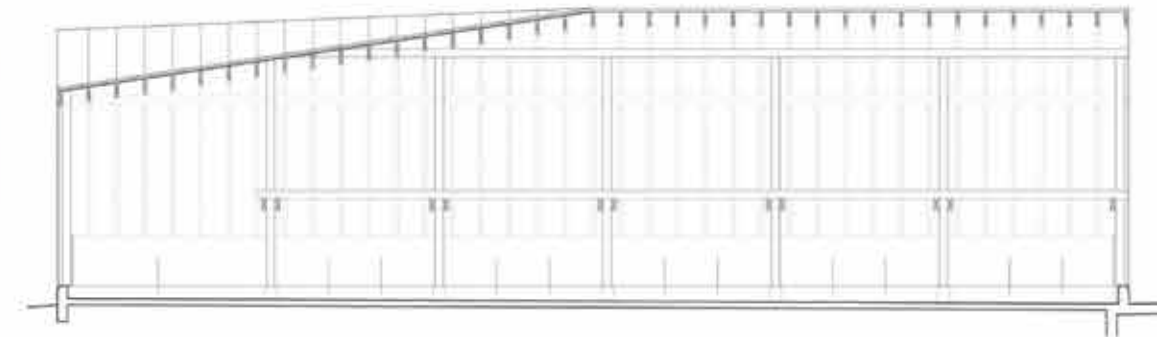
LE CERISIER, 2523 LIGNIÈRES, SWITZERLAND

DESIGNED BY LOCALARCHITECTURE, THE INTENT WAS TO HAVE A FREE-STALL BARN THAT WOULD HOUSE 30 COWS AND STORE HAY BALES. THE MASSING FORM WAS INFLUENCED BY ANALYZING THE FARM TYPOLOGIES PRESENT IN THE REGION. AS A RESULT, THE ARCHITECTS HAVE CREATED A SYNTHESIS OF THE DIFFERENT TRADITIONS, GIVING THE STRUCTURE A CONTEMPORARY SHAPE IN A NEW IDENTITY. AT A DIFFERENT SCALE, THIS UNIFYING DYNAMIC IS REPEATED THROUGH THE BALANCE BETWEEN THE GENTLE SLOPE OF ITS ROOF AND CORNICES AND THE MOUNTAIN CRESTS AROUND IT.

ALTHOUGH THE RESULTING ROOF FORM IS ASYMMETRICAL, THE TWO ROOF BEAMS ASSIST IN KEEPING THE RIDGES OF EACH STANDARD FRAME IN PLACE. BENEATH THE ROOF IS A MEZZANINE HAYLOFT WHICH ALSO ACTS AS BRACING SYSTEM IN ORDER TO HELP THE STRUCTURE FROM COLLAPSING LONGITUDINALLY.



06 EXTERIOR PERSPECTIVE VIEW
A1 N.T.S.



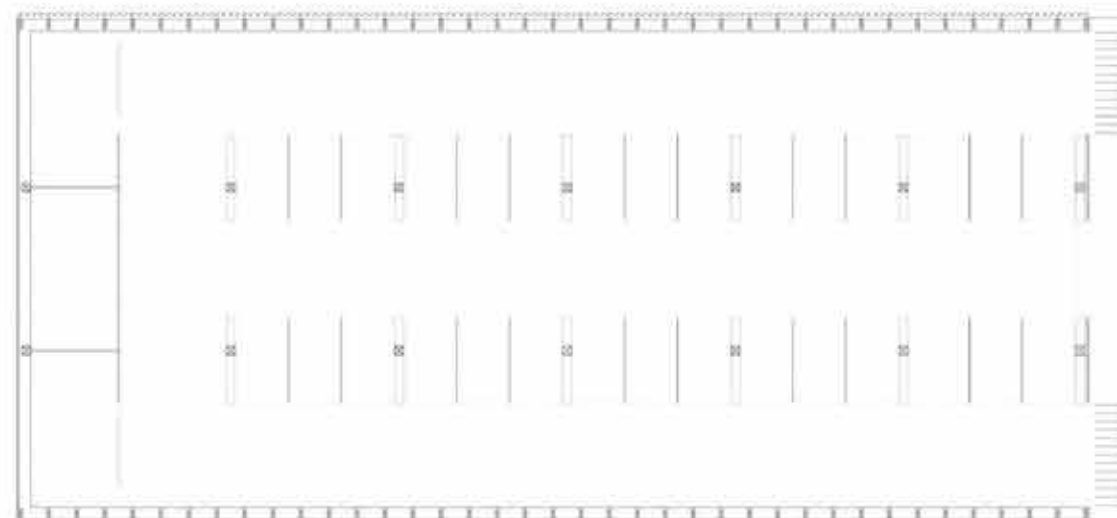
05 LONGITUDINAL SECTION
A1 1/16" = 1'-0"



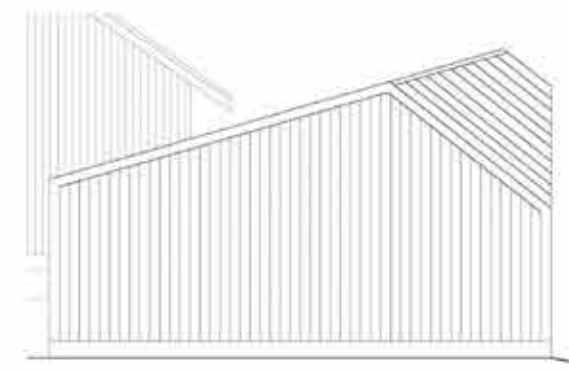
04 CROSS SECTION
A1 1/16" = 1'-0"



03 INTERIOR PERSPECTIVE VIEW
A1 N.T.S.



02 FLOOR PLAN
A1 1/16" = 1'-0"



01 EXTERIOR ELEVATION
A1 1/16" = 1'-0"

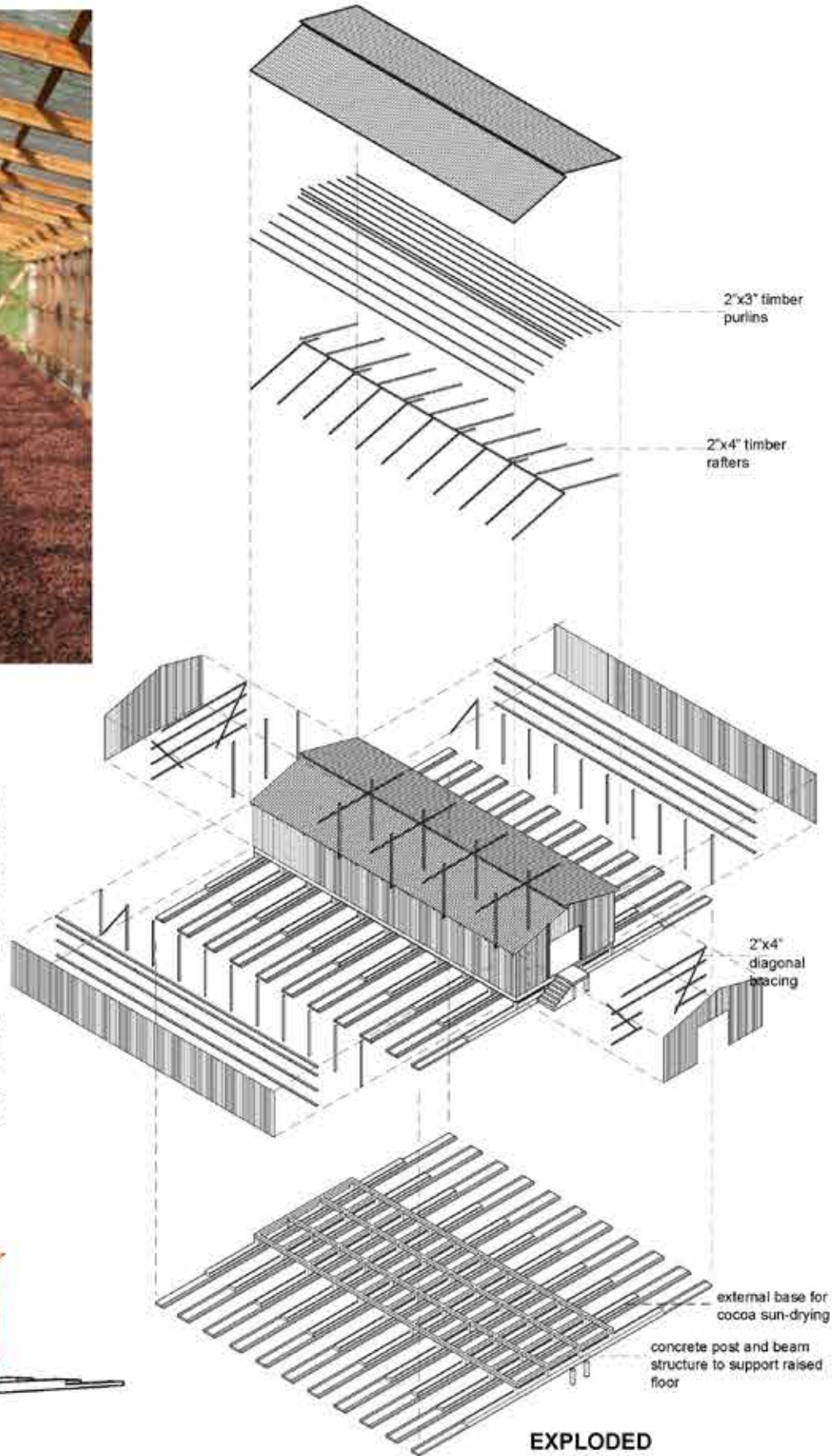
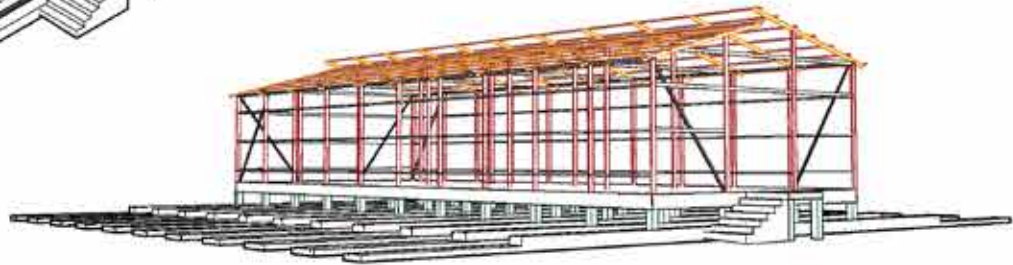
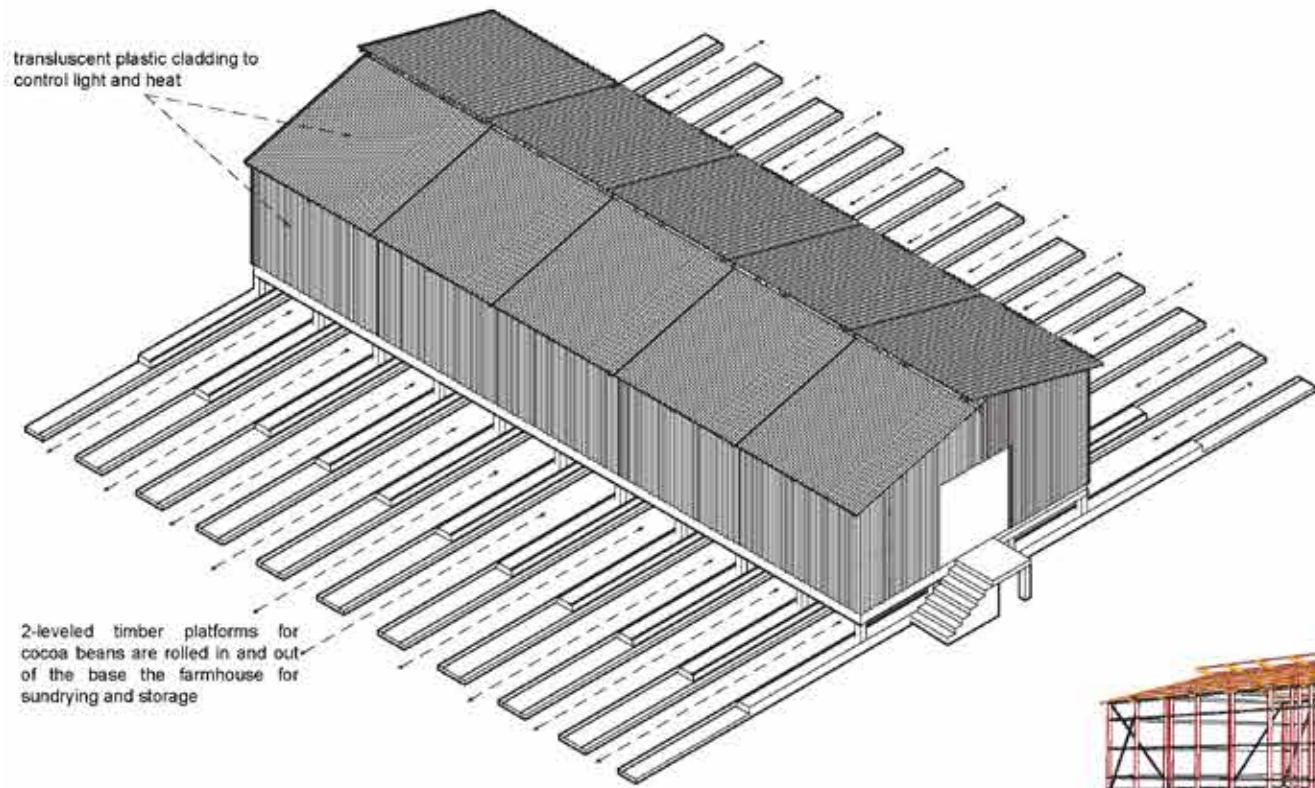
01 CASE STUDY: COW SHED, LIGNIÈRES
NOT TO SCALE
SOURCE: CITATION & PAGE



TYPICAL COCOA DRYING FARMHOUSE.
Grenada Island

This farmhouse is common in most tropical regions where cocoa is largely cultivated/ grown. The unique of this structure is the techniques in sun-drying and storing the cocoa beans during the harvesting period.

Cocoa beans are spread on a large platform which are rolled outside during the day for sun-drying and rolled below the floor slab during the night to prevent moisture.



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03 BAHAY KUBO
NOT TO SCALE



02 BAHAY KUBO
NOT TO SCALE



01 BAHAY KUBO
NOT TO SCALE



06 COCOA DRYING FARMHOUSE
NOT TO SCALE



05 COCOA DRYING FARMHOUSE
NOT TO SCALE



04 COCOA DRYING FARMHOUSE
NOT TO SCALE



09 COW SHED
NOT TO SCALE



08 COW SHED
NOT TO SCALE



07 COW SHED
NOT TO SCALE



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A1.4
STRUCTURAL
FRAME MODELS

A 2.0 SITE AND CONTEXT



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A2.0
SITE AND
CONTEXT



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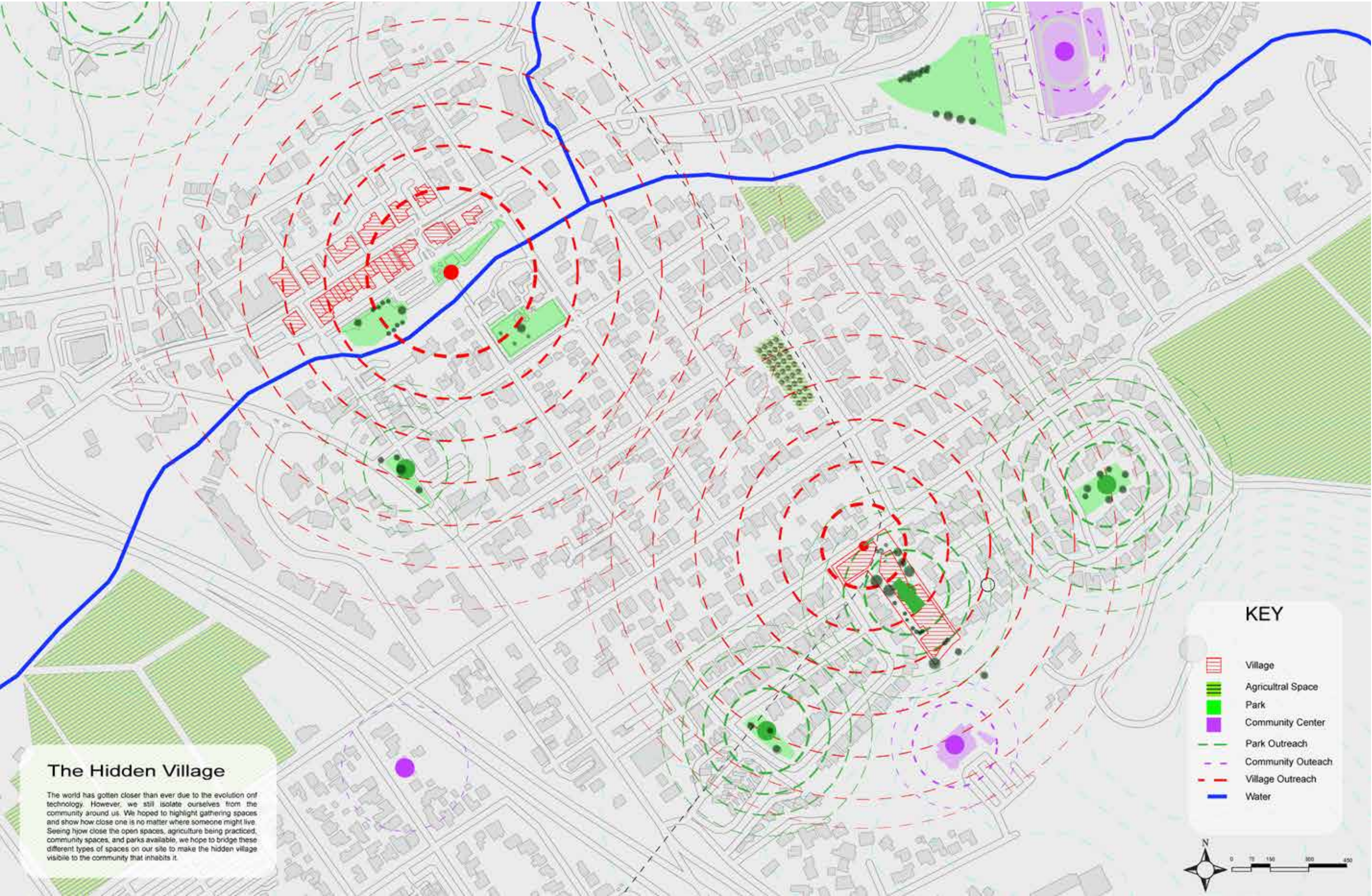
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A Bountiful Harvest

The foundation and growth of a farm, family and the community is based on a passion to take care of the land and the creatures that live in it. When future generations are raised and cultivated in this manner, it benefits both the land and people around it, reaping the rewards for years to come.



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Japanese Agriculture & Ecology

We need agriculture to produce crops that we consume on a daily basis and we need ecology to produce healthy organisms within our soil and environment. Various factors of a community's diet in ancient Japan could be influenced by geography, eating habits, aesthetic appearances of dishes, or religious beliefs. In either case, Agriculture in ancient Japan, as it remains today, was largely focussed on cereal and vegetable production, with meat being produced in limited quantities. As for ecology in ancient Japan, Japanese gardens provide symbolism and spread Zen sentiments that leave organisms with refreshed and peaceful minds. Take the Wisteria flowers for example. They are it is thought to represent good luck, kindness and longevity due to its long vines, and they keep demons away. These organisms are a testament of how to enrich our lands and provide a better atmosphere.



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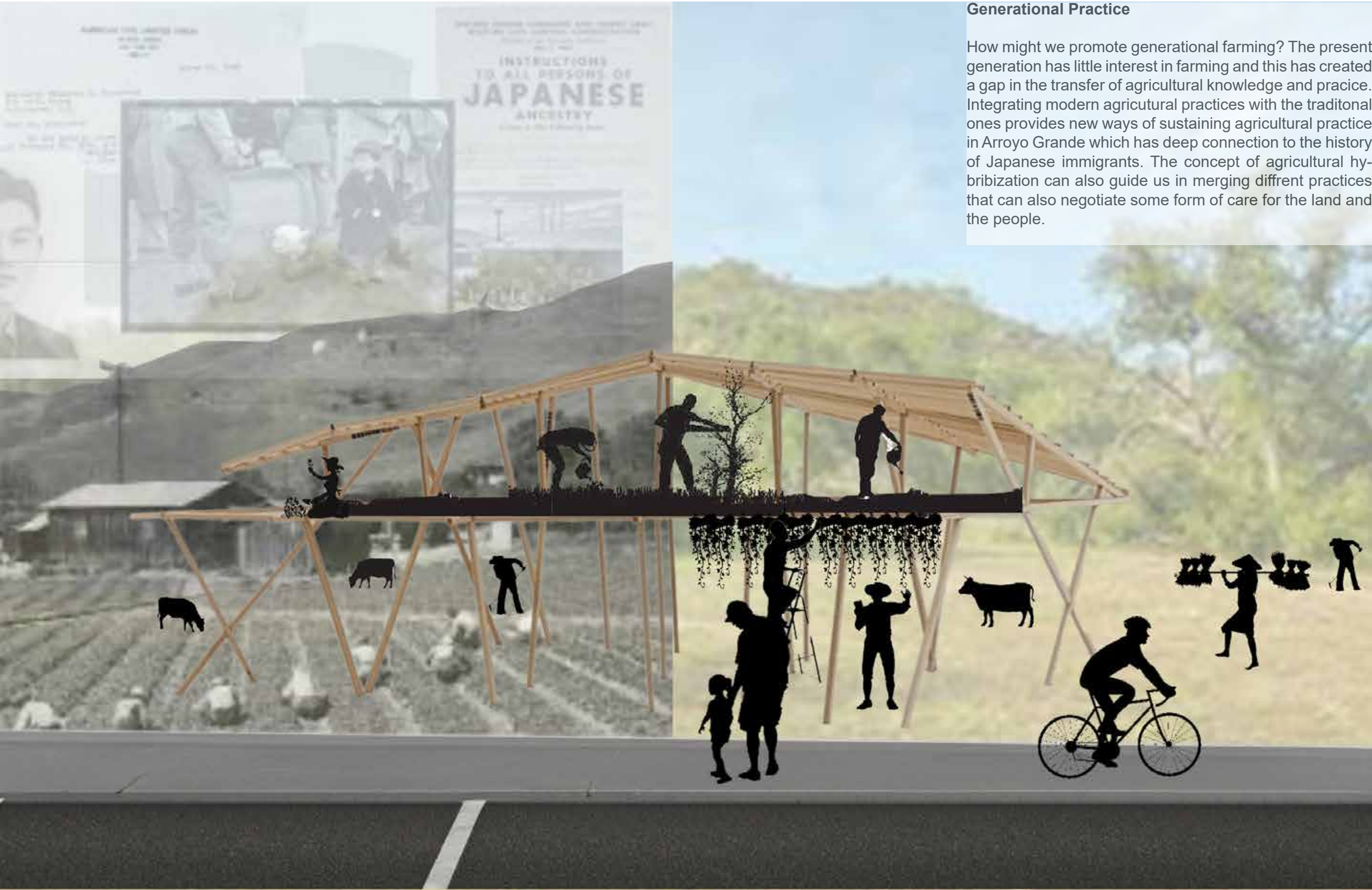
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Generational Practice

How might we promote generational farming? The present generation has little interest in farming and this has created a gap in the transfer of agricultural knowledge and practice. Integrating modern agricultural practices with the traditional ones provides new ways of sustaining agricultural practice in Arroyo Grande which has deep connection to the history of Japanese immigrants. The concept of agricultural hybridization can also guide us in merging different practices that can also negotiate some form of care for the land and the people.



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02 BACK OF LOT TOWARDS E CHERRY AVE



01 FRONT OF LOT FROM E CHERRY AVE



04 BIRD'S EYE VIEW OF SITE



03 CONTEXTUAL NEIGHBORHOOD



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A2.3
SITE VISIT



02 CLEAR VIEW FROM E CHERRY SIDE TO THE REST OF THE SITE



01 CONDITION ON THE BACK OF THE LOT



04 VIEW OF THE TREES SEPARATING THE PARKING SPOT AND MAIN SITE



03 VIEW FROM POTENTIAL SENIOR LIVING



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A2.3.1
SITE VISIT



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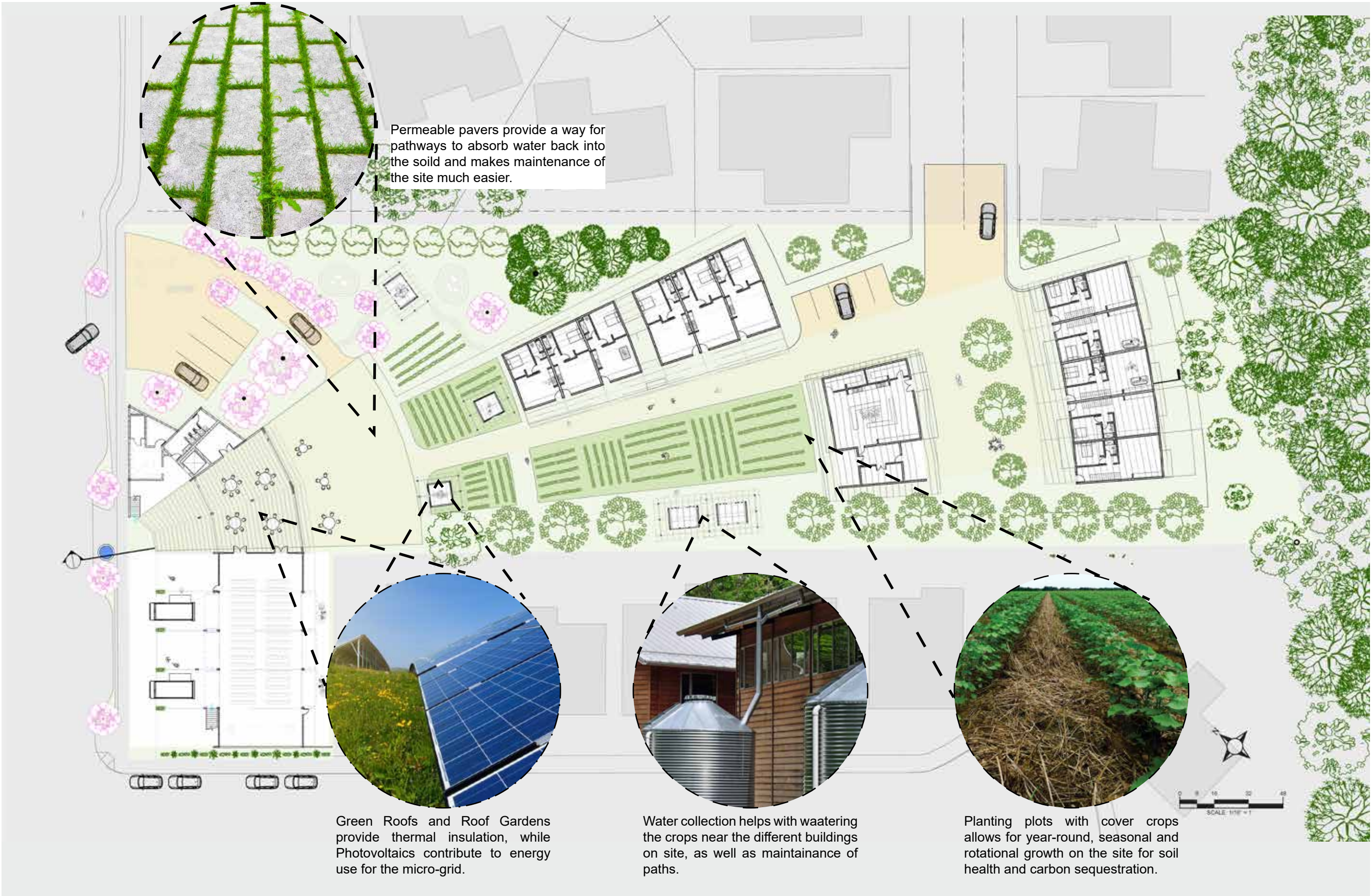
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**A2.4
REGENERATIVE
LANDSCAPE**



Permeable pavers provide a way for pathways to absorb water back into the soil and makes maintenance of the site much easier.

Green Roofs and Roof Gardens provide thermal insulation, while Photovoltaics contribute to energy use for the micro-grid.

Water collection helps with watering the crops near the different buildings on site, as well as maintenance of paths.

Planting plots with cover crops allows for year-round, seasonal and rotational growth on the site for soil health and carbon sequestration.

A 3.0 PROGRAMMING & LIFE SAFETY



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A3.0
PROGRAMMING &
LIFE SAFETY



02 TECTONIC MODEL 2



01 TECTONIC MODEL 1



04 TECTONIC MODEL 4



03 TECTONIC MODEL 3



05 TECTONIC MODEL 5



05 TECTONIC MODEL 5



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A3.1 TECTONIC MODULES/ MODELS



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LEGEND

- Public Spaces
- Semi-public Spaces
- Storage Area
- Paved Area
- Private Spaces
- Circulation
- Vertical circulation
- Sanitary Area
- Agricultural fields

A. Event Center B. Outdoor Living Area C. Meeting Spaces D. Farmland E. Seniors' Residential Block F. Common Kitchen G. Multi-family Residential Block H. Private Garden





Arroyo Grande Village

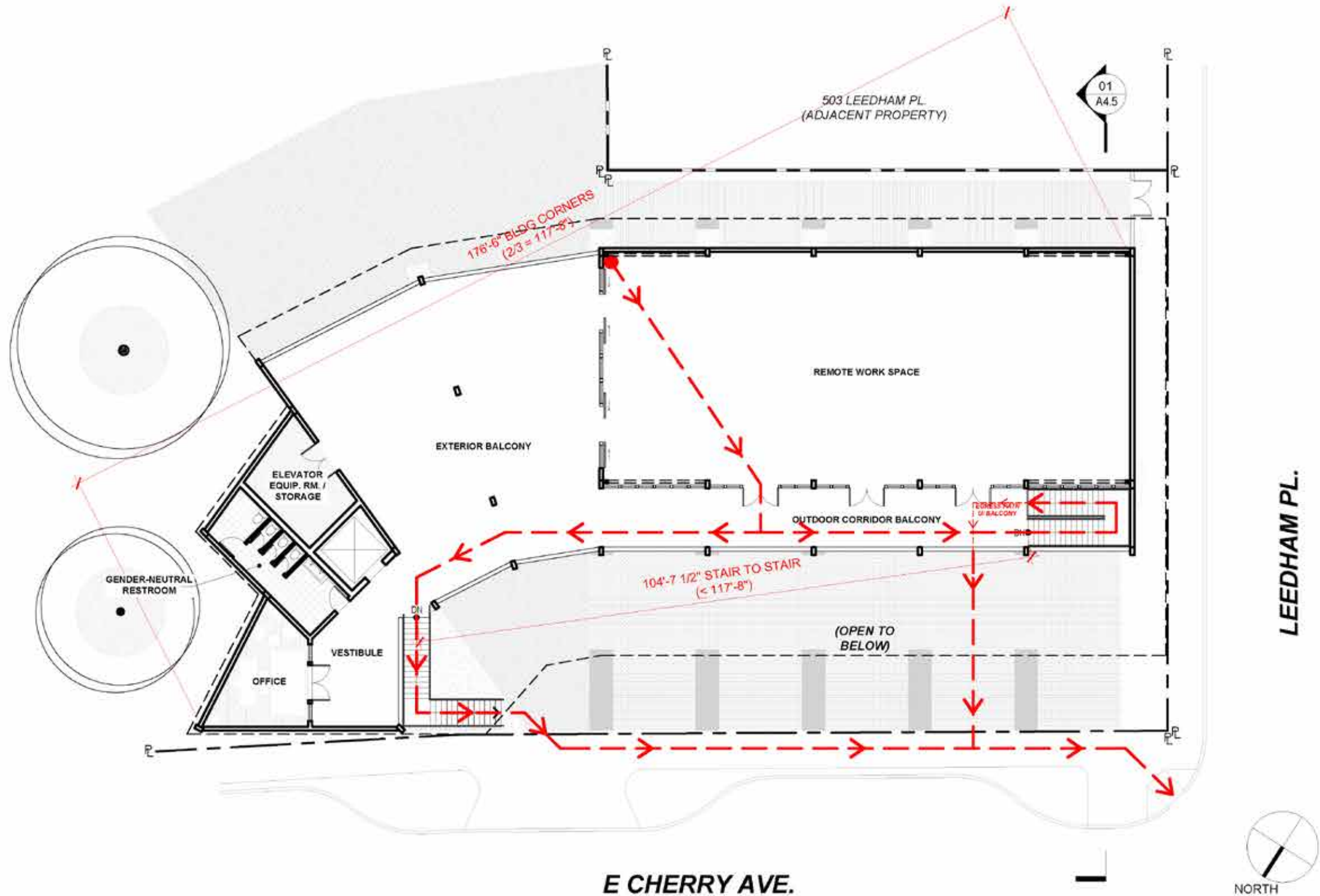
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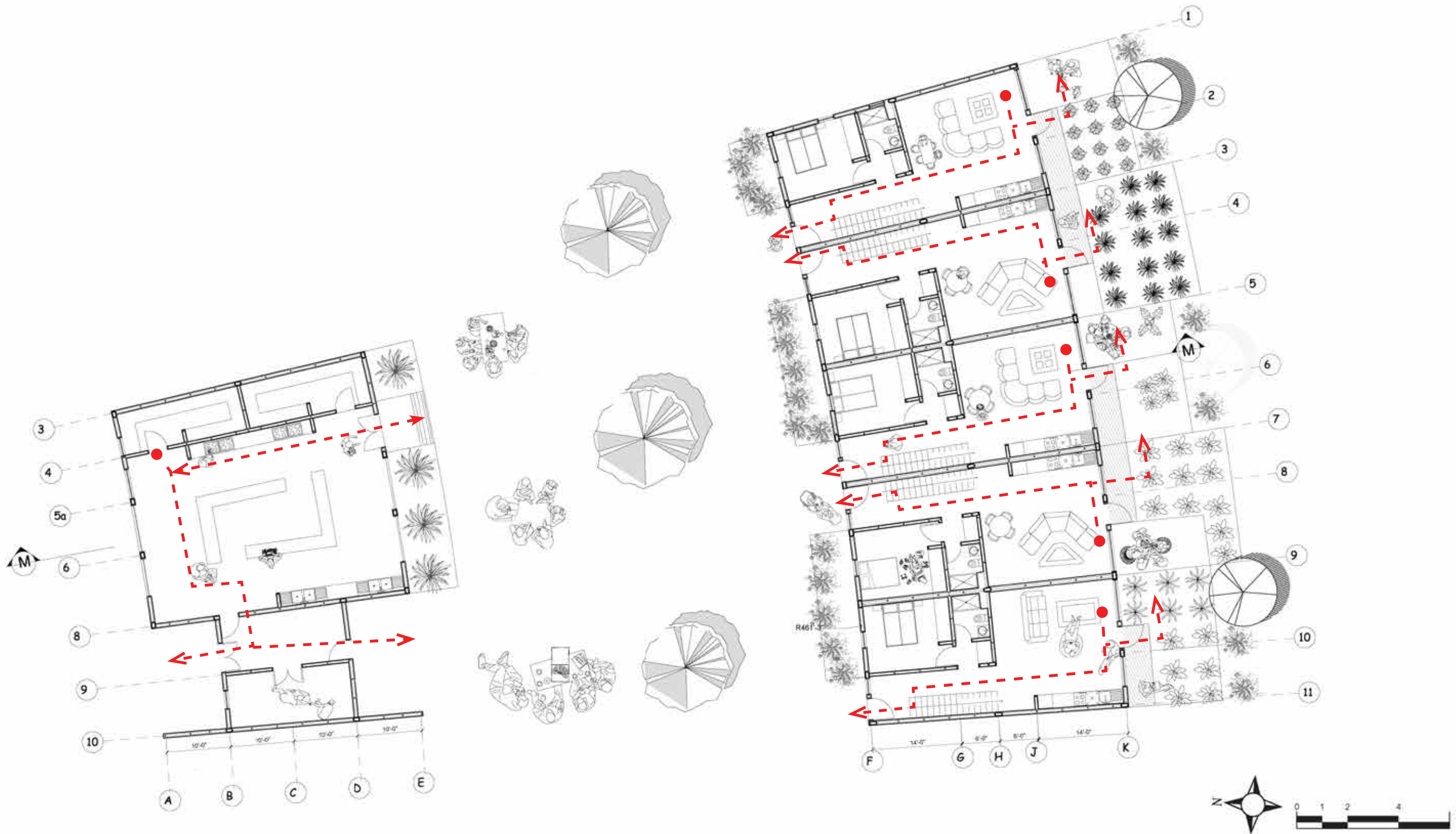
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01 MULTI-FAMILY FIRST FLOOR & SHARED KITCHEN EGRESS

**A3.3.1
LIFE SAFETY
ANALYSIS
AND EGRESS
DIAGRAM**



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Village

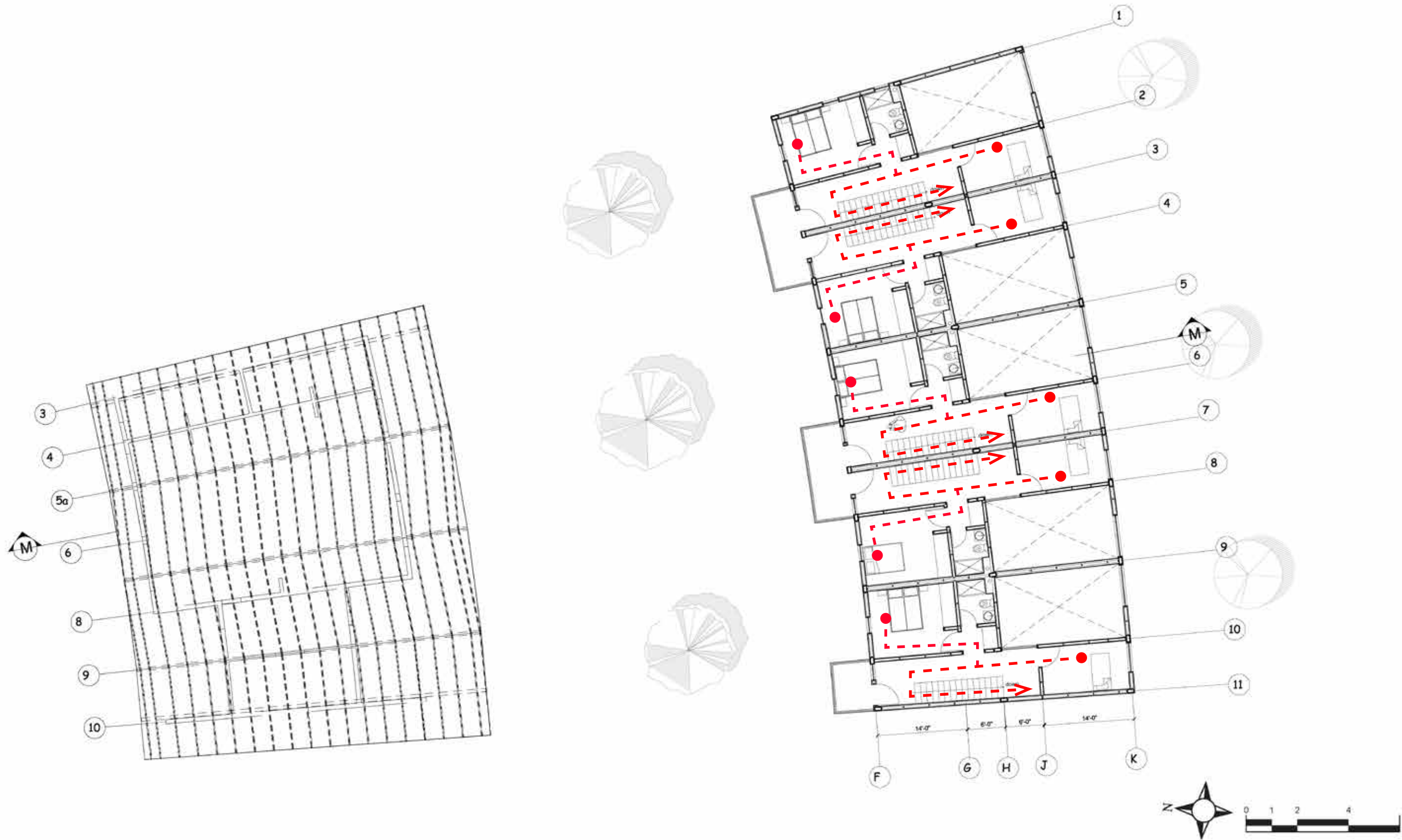
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01 MULTI-FAMILY FIRST FLOOR & SHARED KITCHEN EGRESS

**A3.3.2
LIFE SAFETY
ANALYSIS
AND EGRESS
DIAGRAM**



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Village

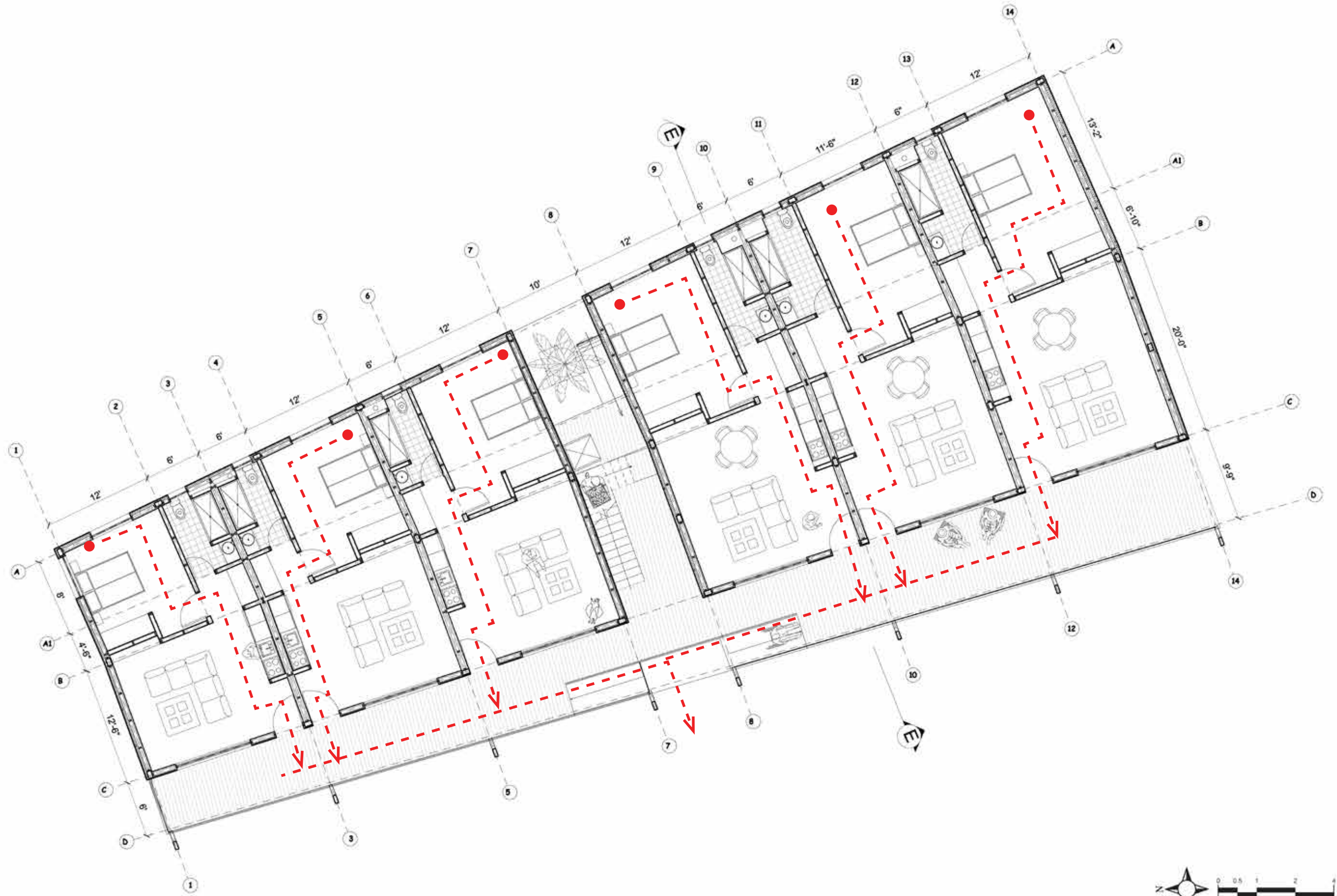
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01 SENIOR LIVING EGRESS PLAN

**A3.3.3
LIFE SAFETY
ANALYSIS
AND EGRESS
DIAGRAM**



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Village

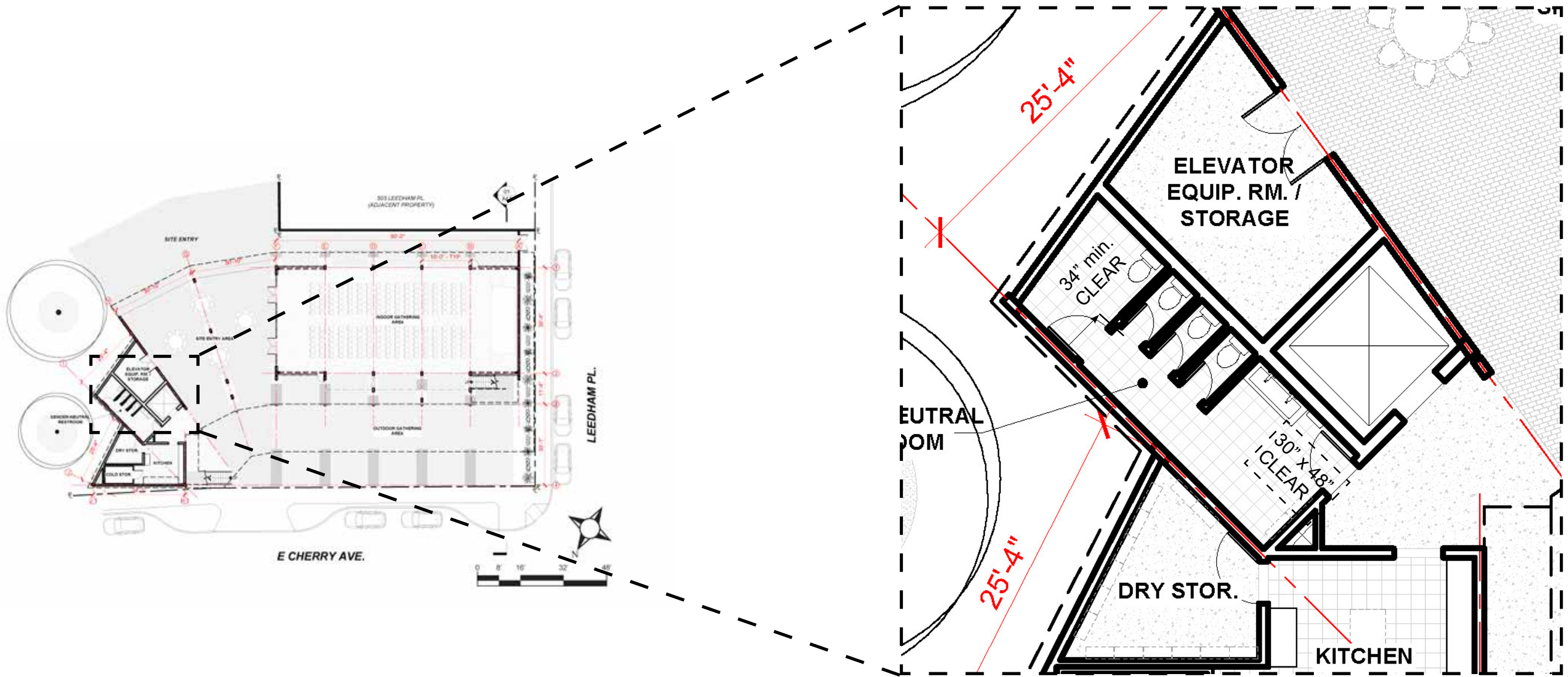
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A 4.0 ARCHITECTURE



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A4.0
ARCHITECTURE



01 AERIAL VIEW FROM E CHERRY AVE



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A4.1
BIRD'S-EYE
VIEW



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01 VIEW FROM SENIOR LIVING PORCH LOOKING TOWARDS EVENT CENTER

A4.1.5
EXTERIOR VIEW



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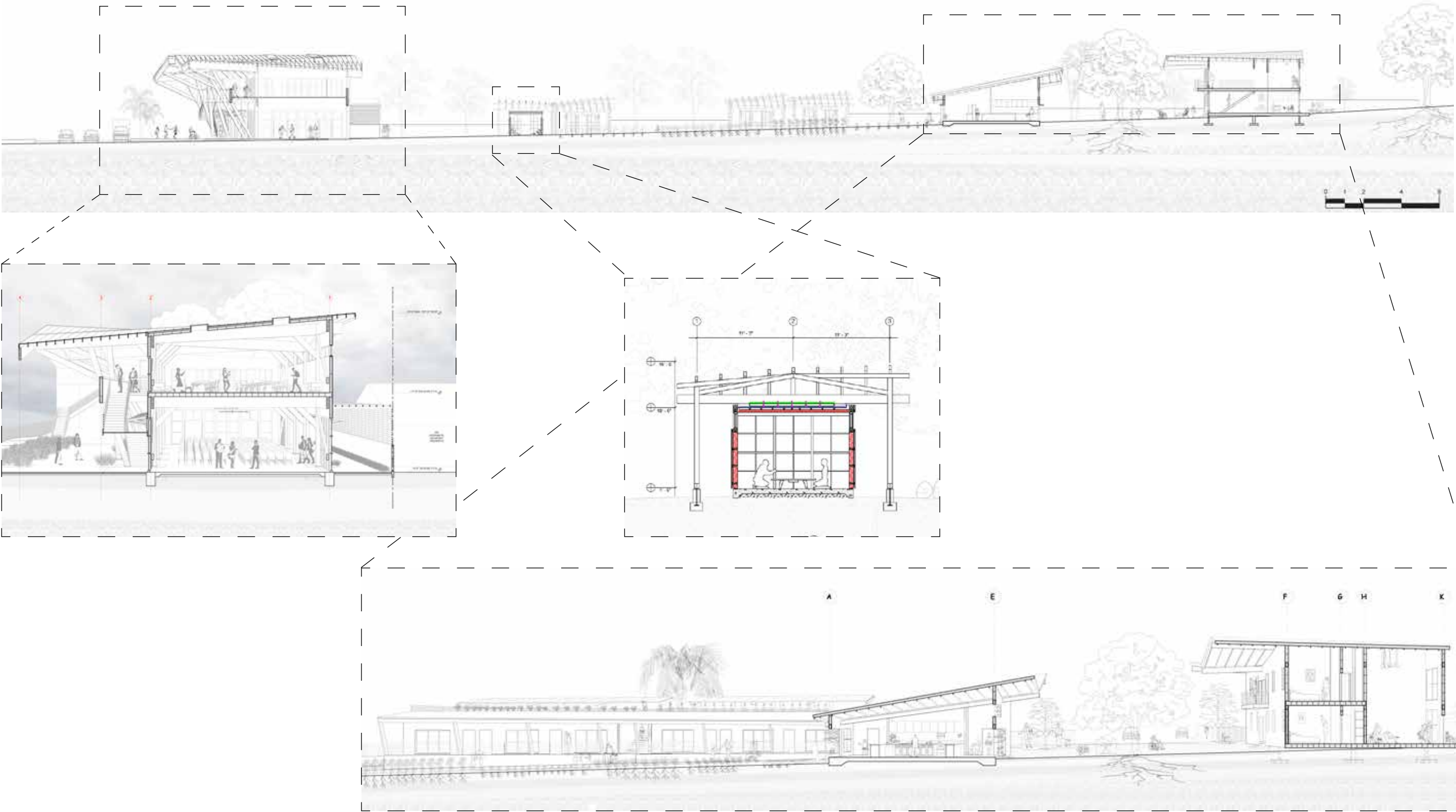
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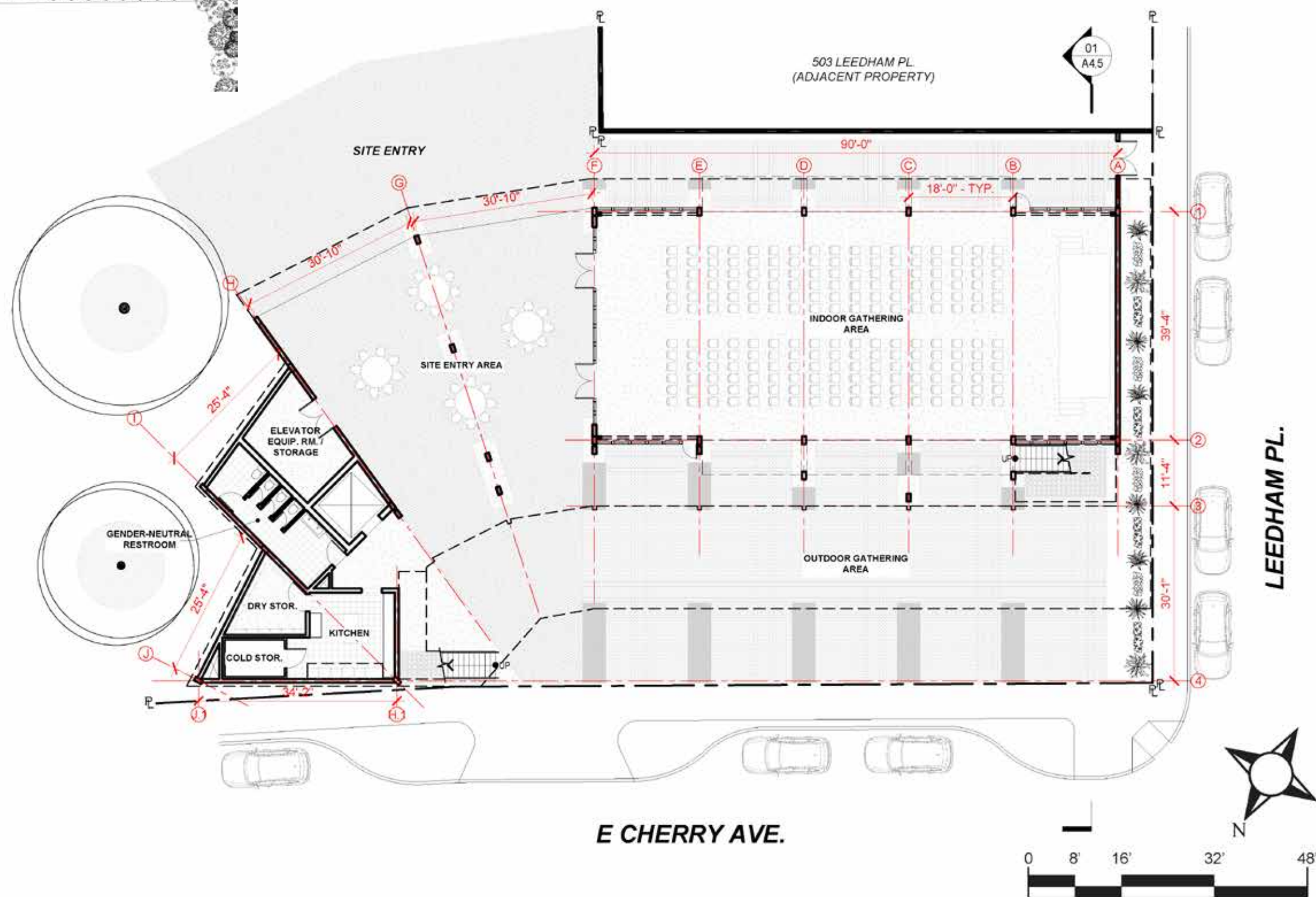
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01 SITE SECTION AND CALLOUTS

A4.3
SITE SECTION



01 EVENT CENTER GROUND FLOOR



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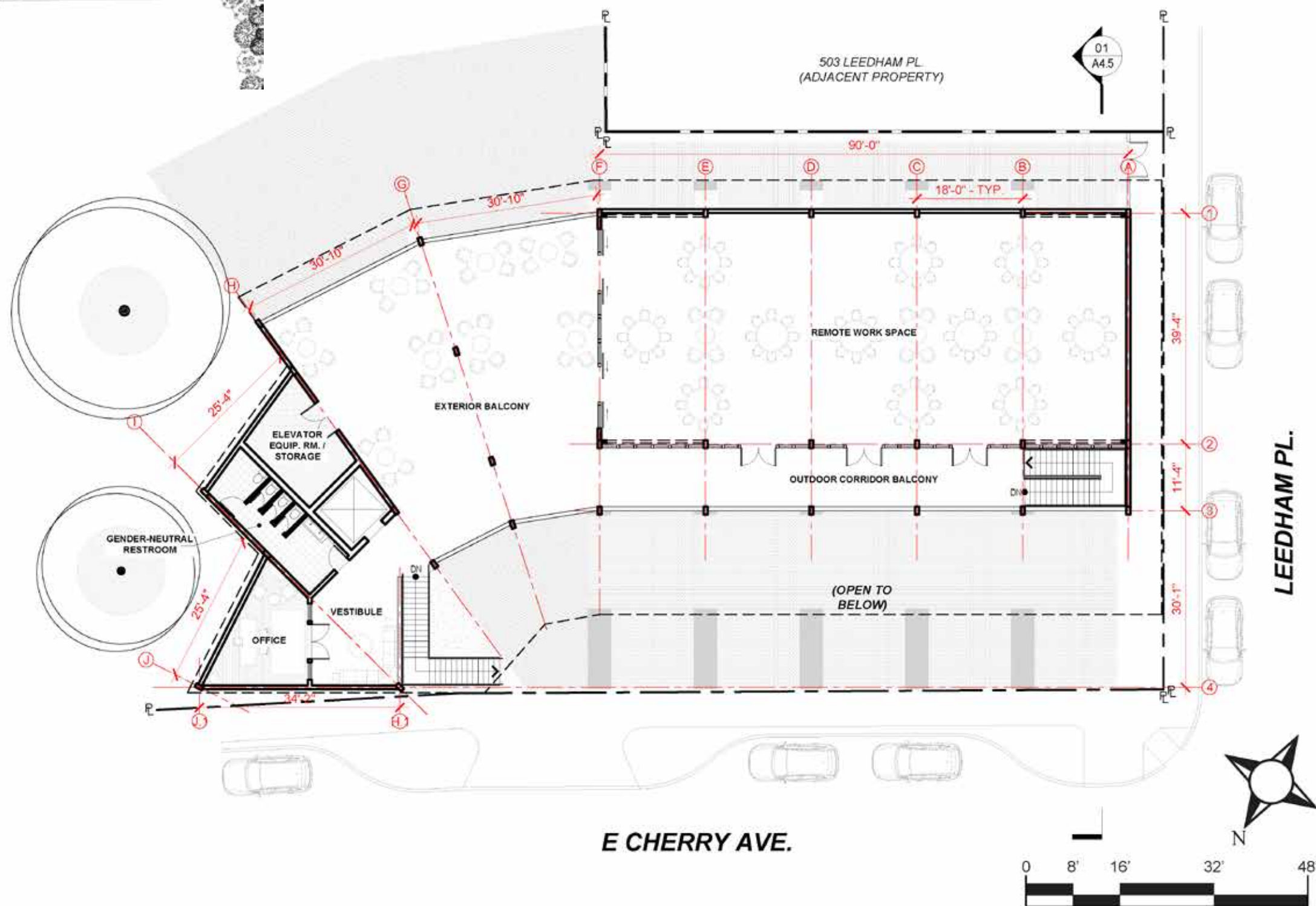
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A4.4 PLAN



01 EVENT CENTER SECOND FLOOR



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A4.4.1
PLAN



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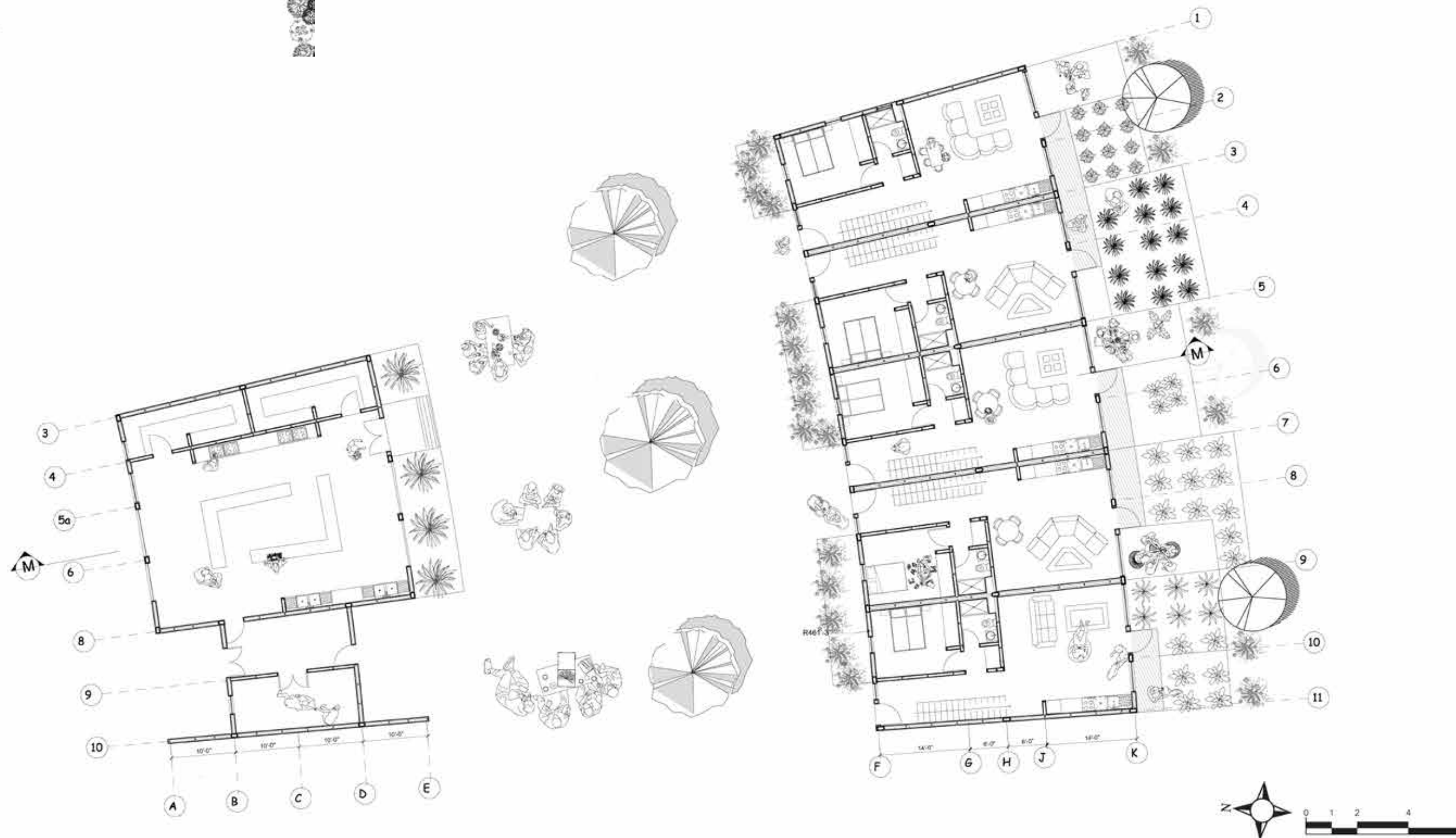
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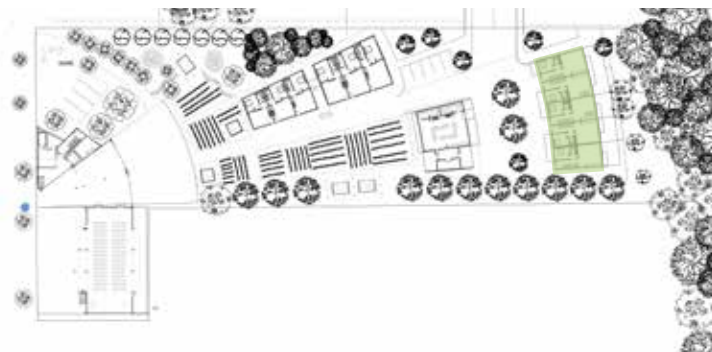
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01 KITCHEN & MULTI-FAMILY RESIDENTIAL FIRST FLOOR PLAN

A4.4.2
PLAN



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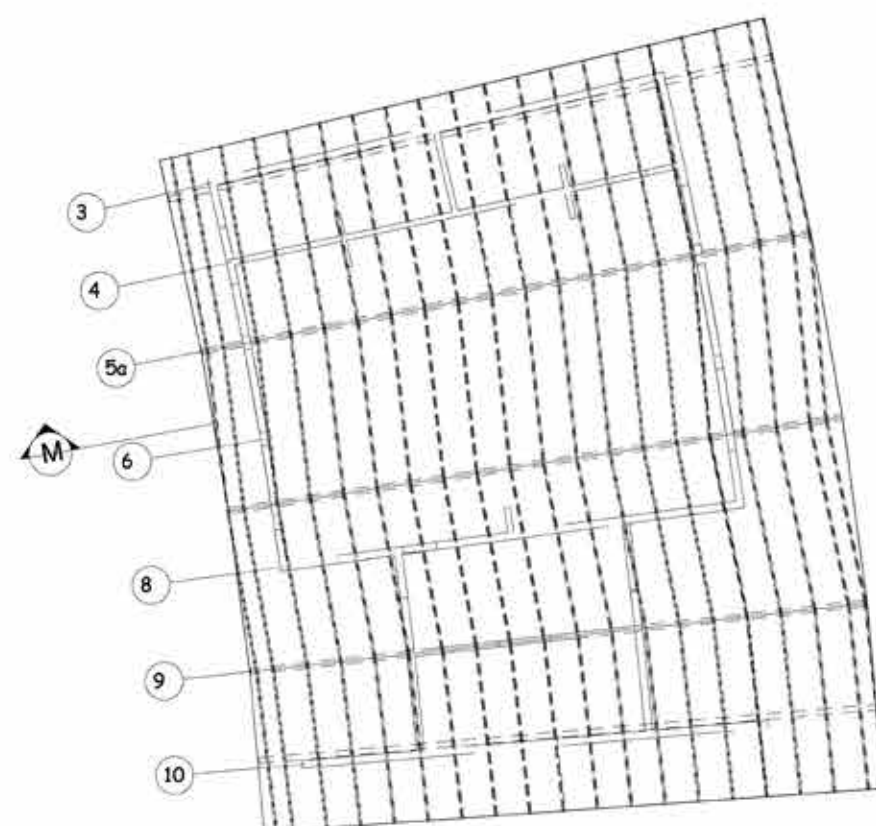
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01 KITCHEN & MULTI-FAMILY RESIDENTIAL SECOND FLOOR PLAN

A4.4.3
PLAN



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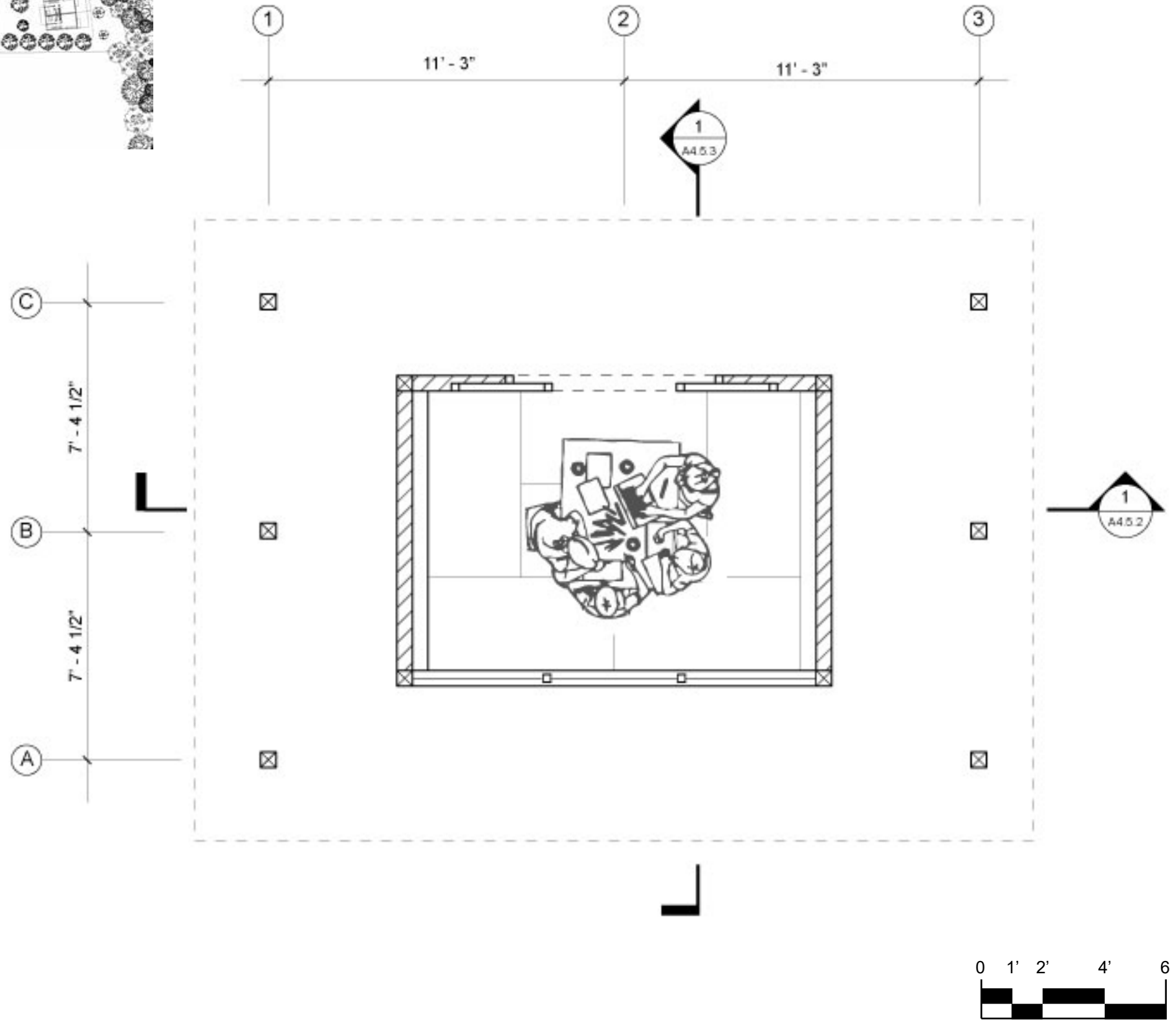
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**A4.4.4
PLAN**



01 SENIOR RESIDENTIAL BLOCK FLOOR PLAN



01 TEAHOUSE & LARGE MEETING PLAN



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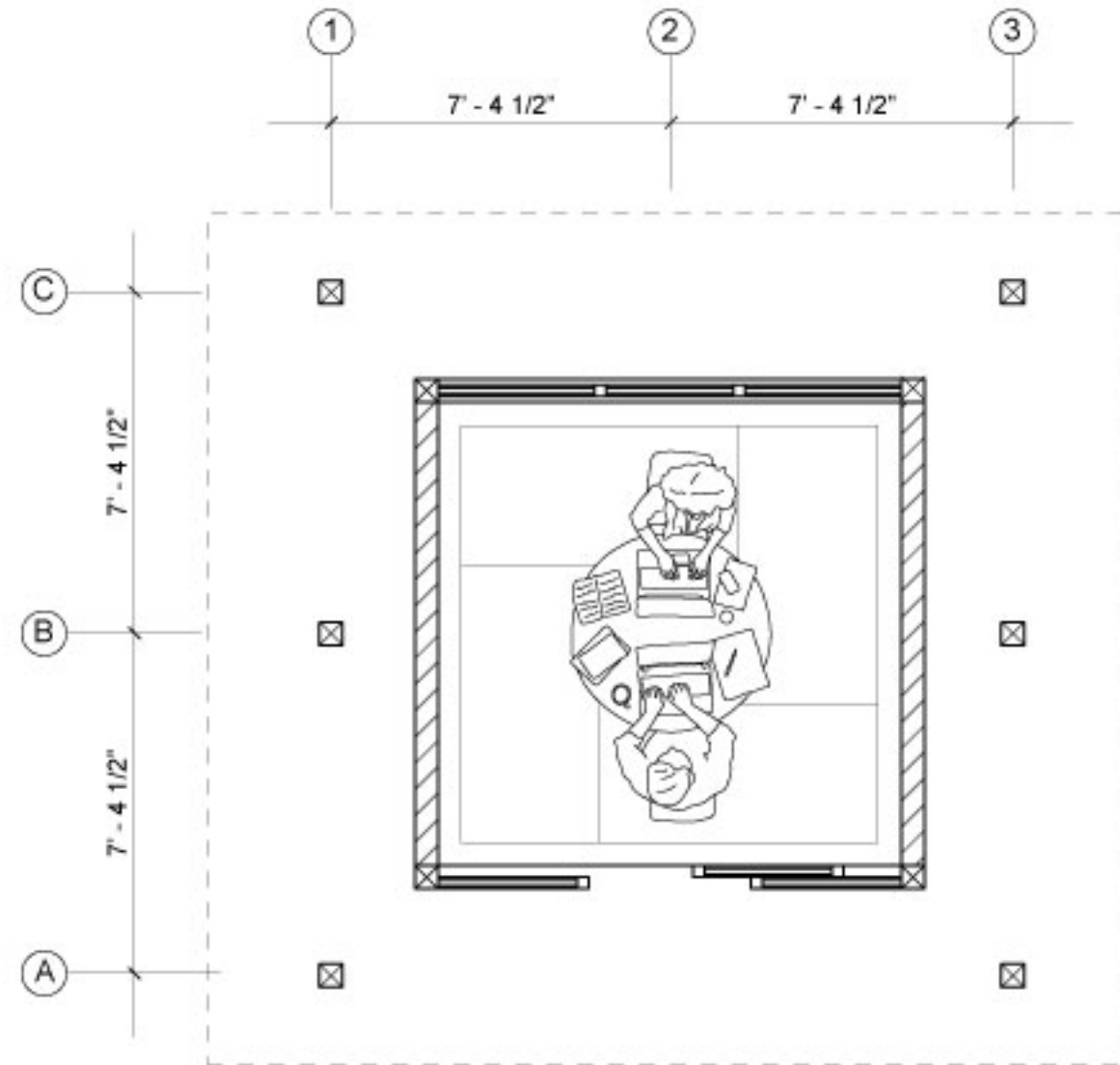
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**A4.4.5
PLAN**



01 SMALL MEETING PLAN



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A4.4.6
PLAN



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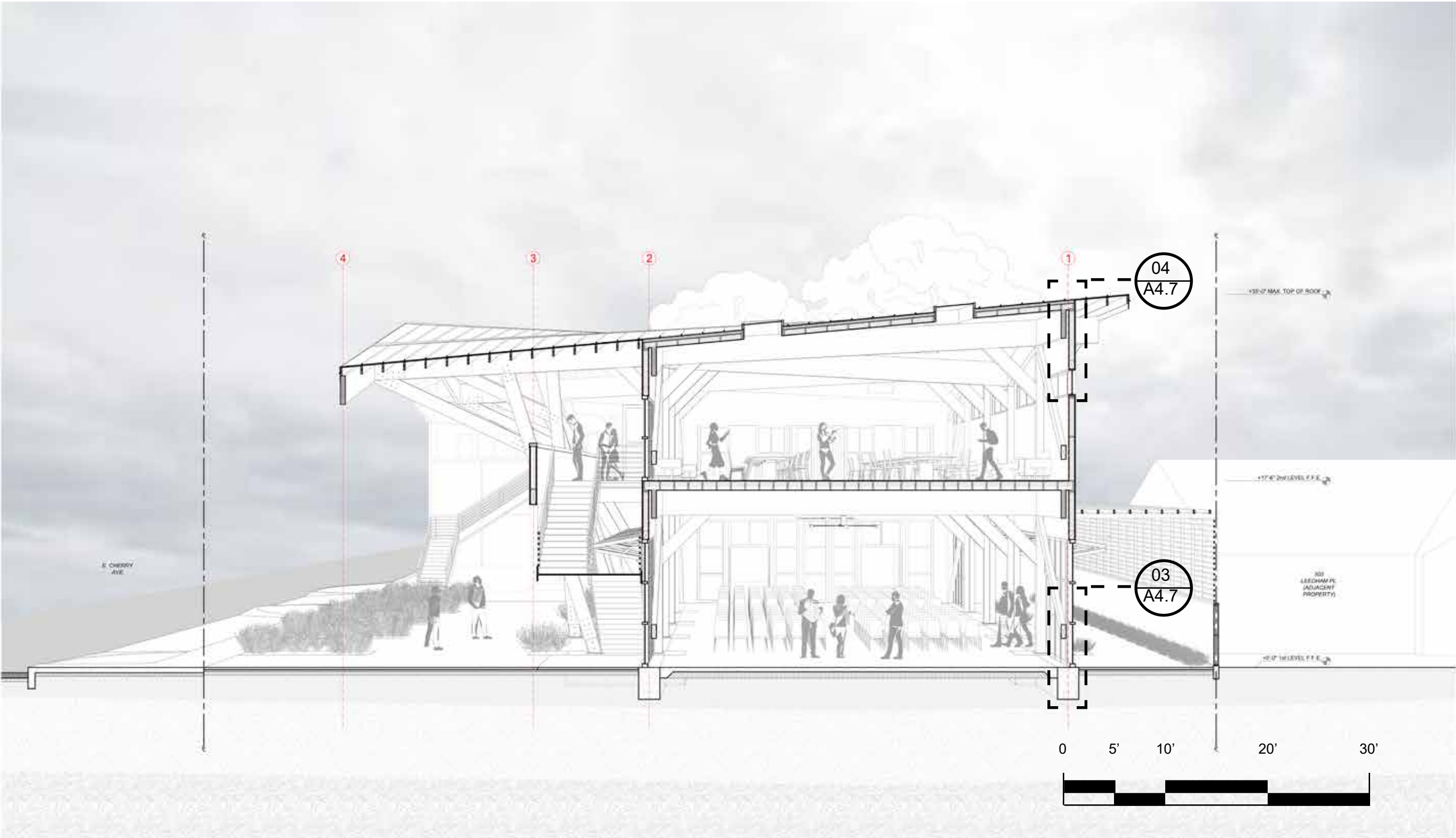
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01 EVENT CENTER GROUND FLOOR

**A4.5
SECTION**



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01 KITCHEN AND MULTI-FAMILY RESIDENTIAL SECTION

A4.5.1
SECTION



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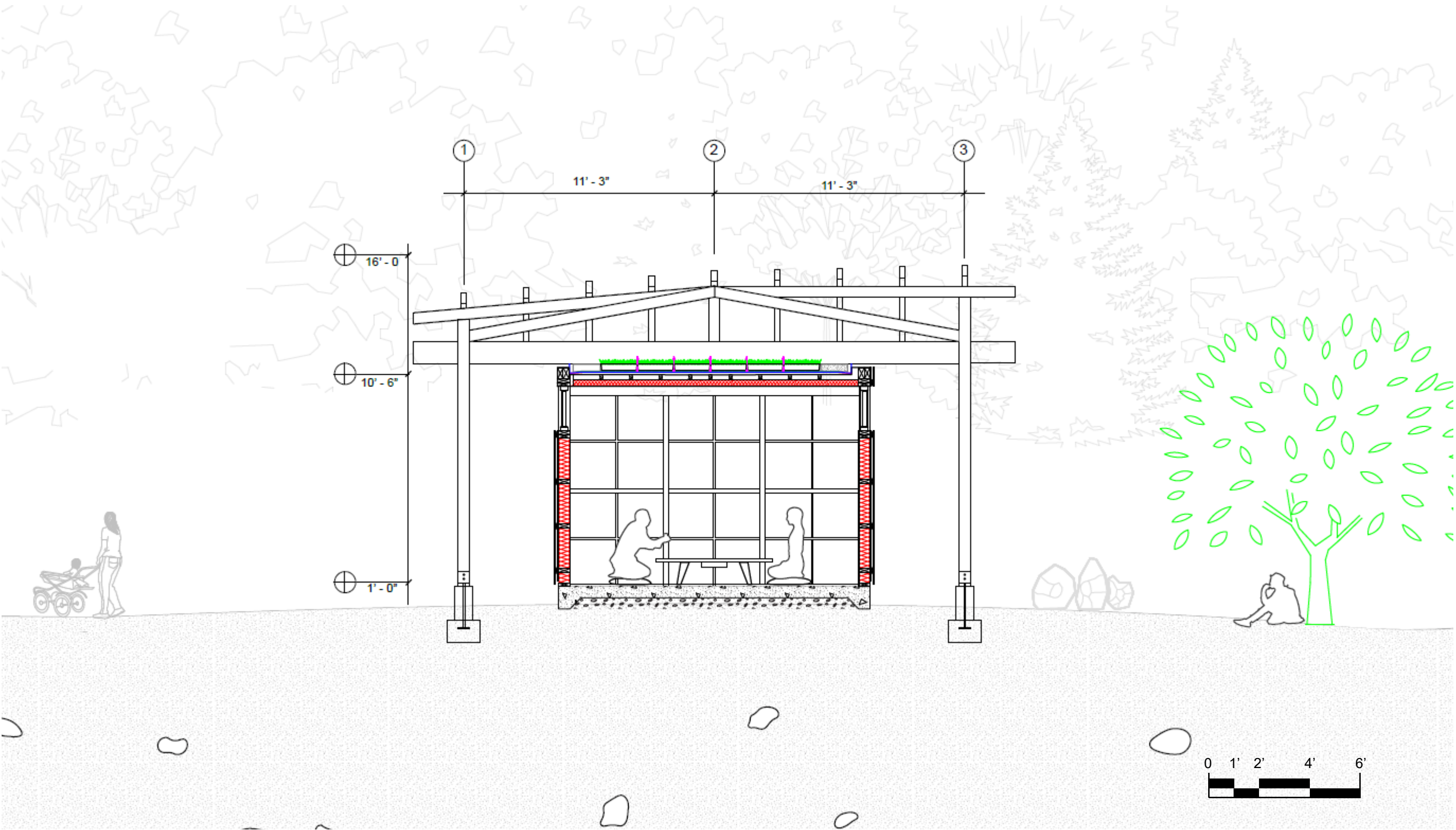
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01 TEA HOUSE SECTION

A4.5.3
SECTION



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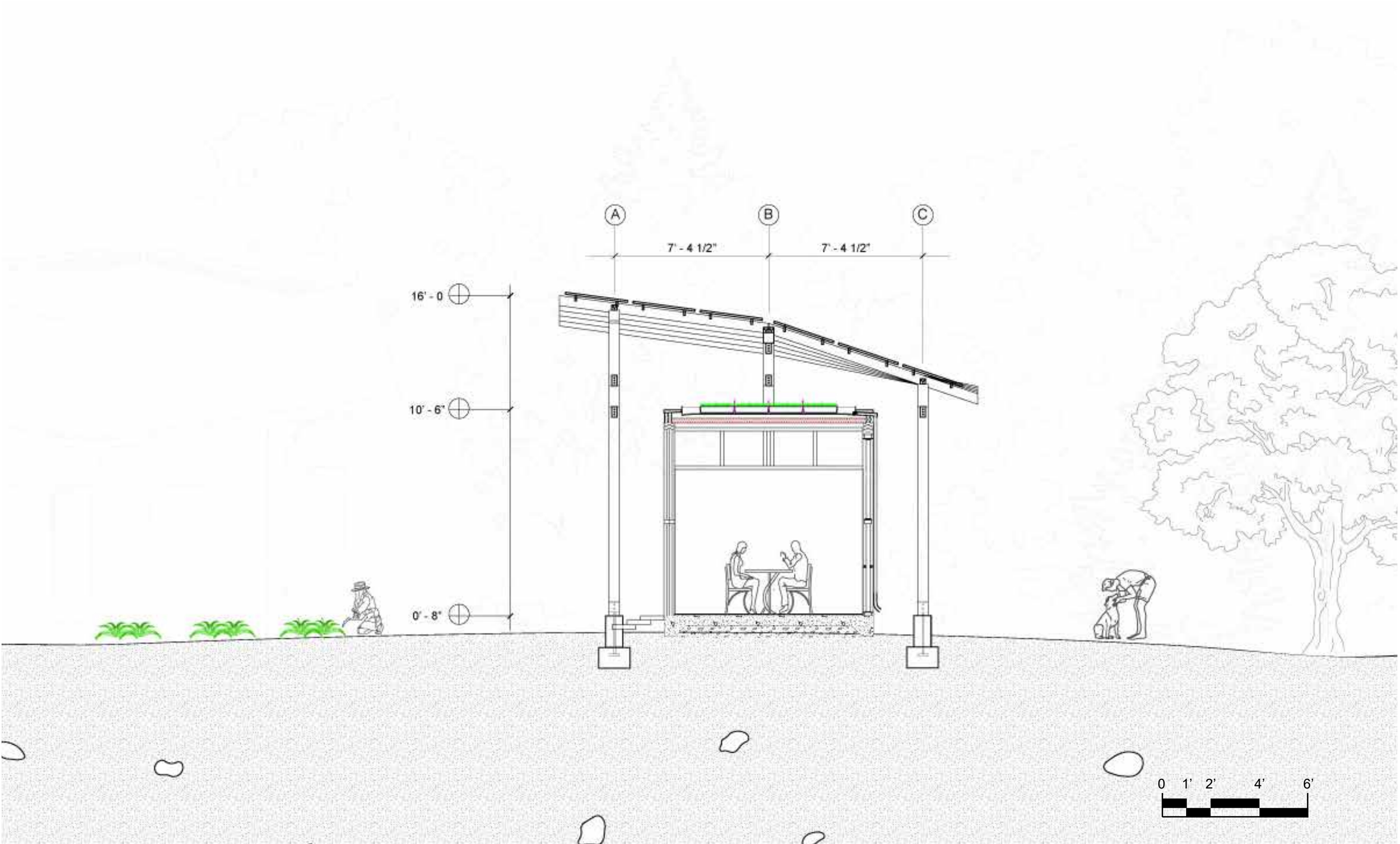
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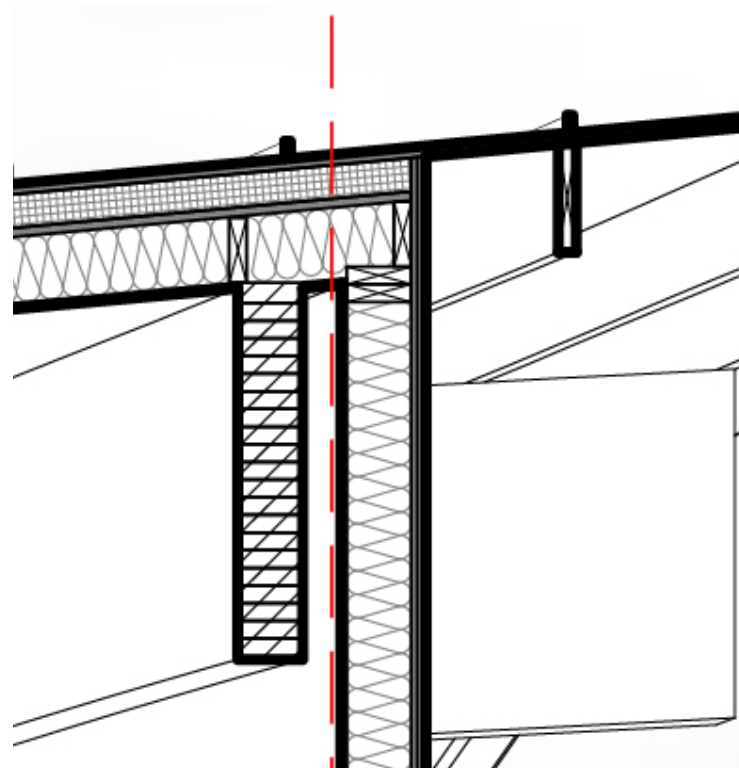
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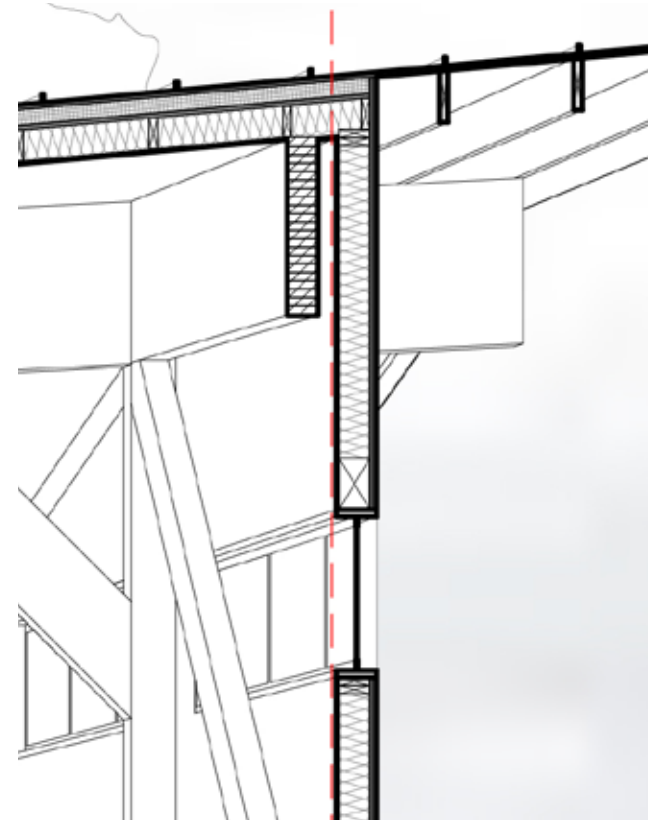


01 LARGE MEETING SECTION

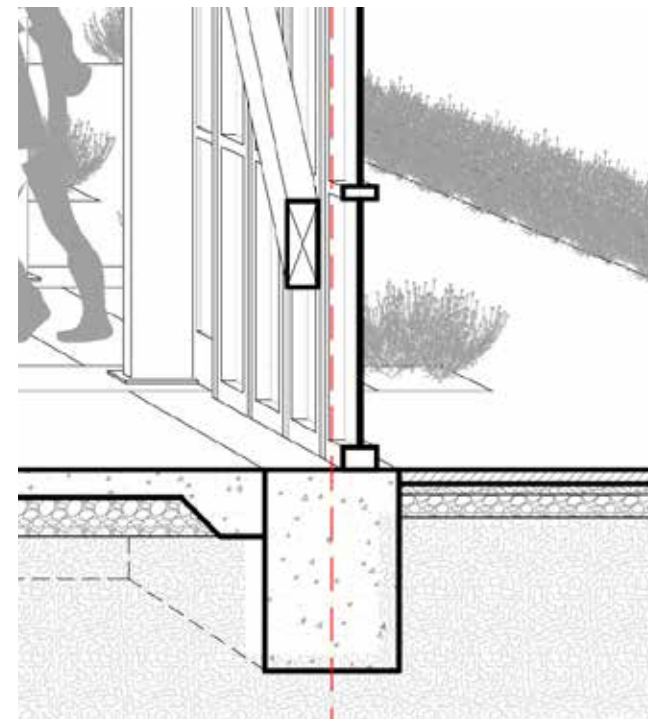
**A4.5.4
SECTION**



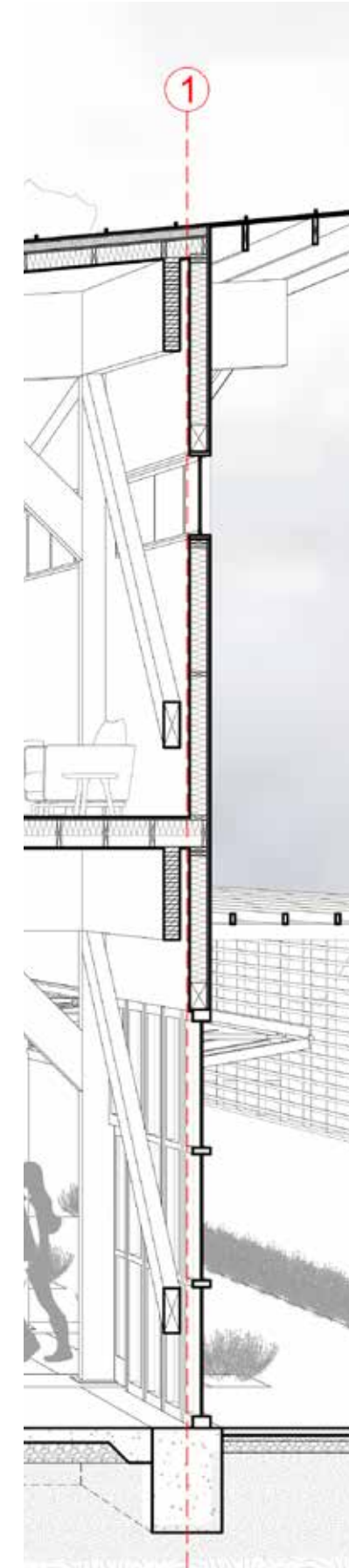
04 ROOF CONNECTION
A4.5



02 2ND FLOOR WINDOW AND WALL
A4.5



03 FOUNDATION AND WINDOW
A4.5



01 WALL ASSEMBLY
A4.5



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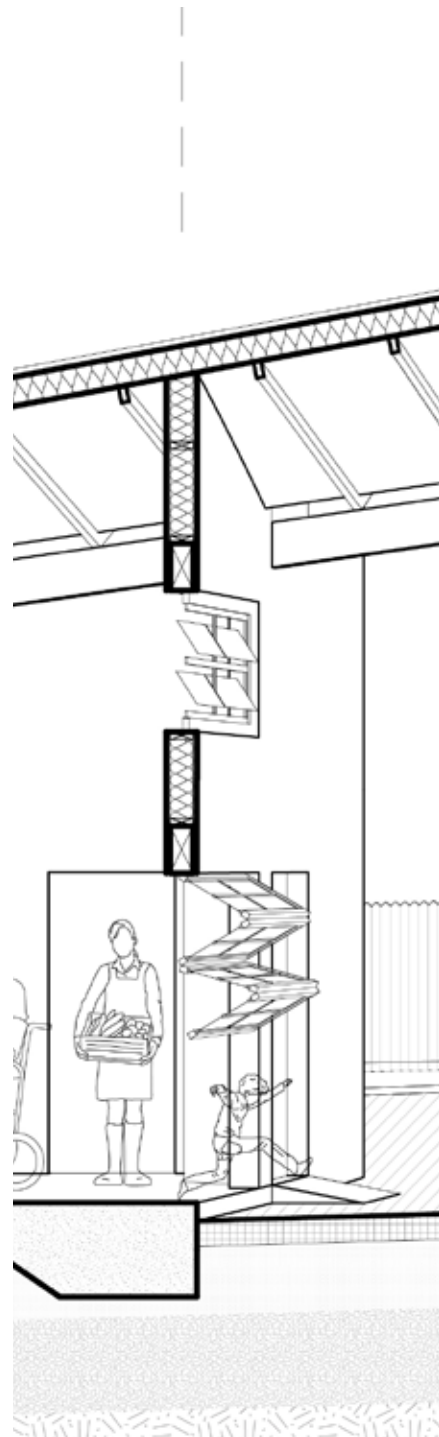
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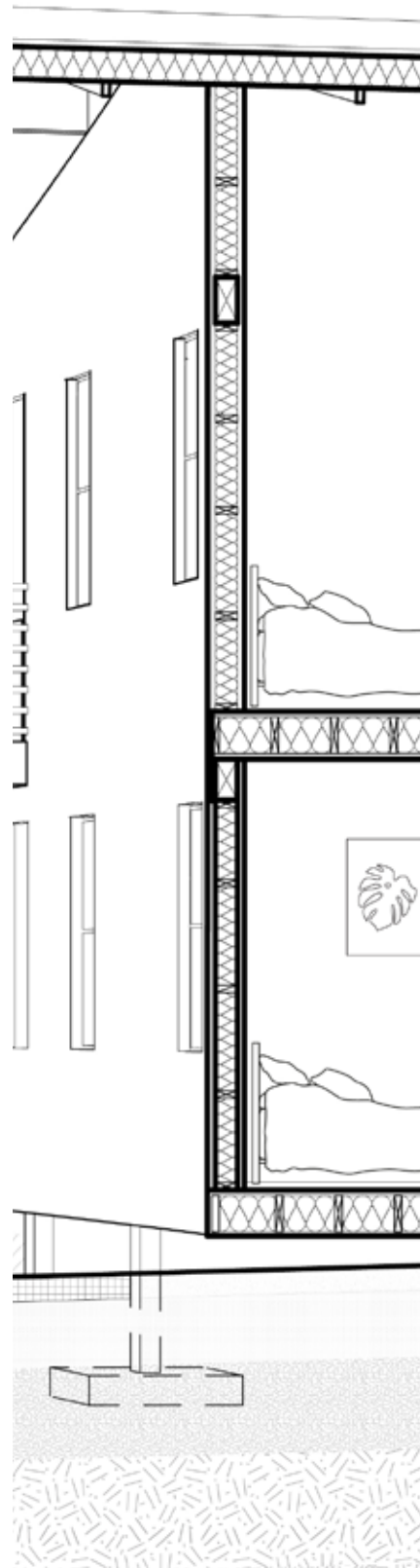
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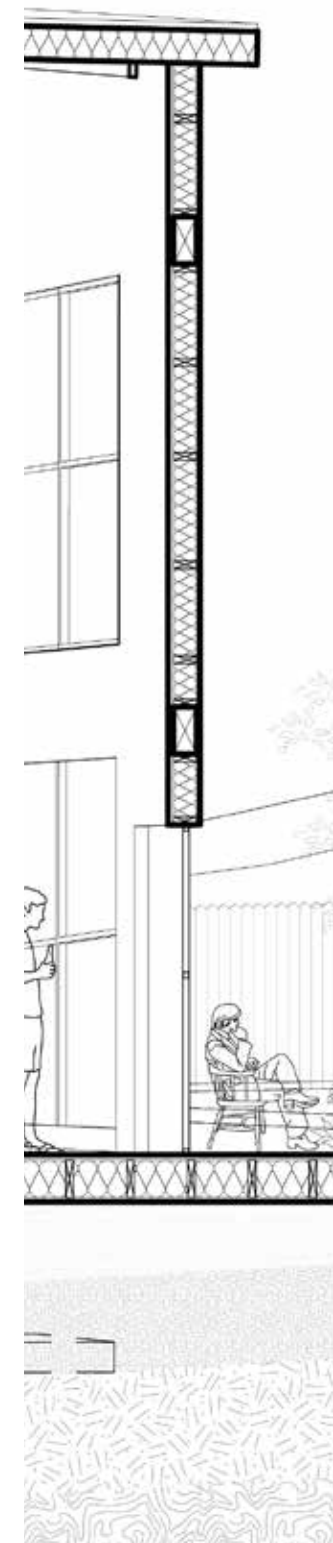
**A4.7
DETAILS**



03 KITCHEN WALL FACING OPEN SPACE
A4.5.1



02 MULT. FAMILY WALL FACING OPEN SPACE
A4.5.1



01 MULT.FAMILY BACKYARD WALL
A4.5.1



Arroyo Grande Village

BENJAMIN MOORE FUTURE OF DESIGN CHALLENGE




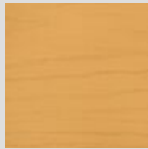
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A4.7.1 DETAILS

PAINT/STAINS	DESCRIPTION	LOCATION	NOTES
	Manufacturer: Benjamin Moore Product: AURA Interior (N524) Finish: Eggshell Color Name/Number: Atrium White OC-145	All Interior Walls for places for social spaces.	1. First Floor Event Space 2. Second Floor Event Space 3. Community Kitchen 4. Meeting Spaces
	Manufacturer: Benjamin Moore Product: AURA Interior (N524) Finish: Eggshell Color Name/Number: Jimica AF-315	All private and living spaces.	1. Private residential rooms 2. Teahouse
	Manufacturer: Benjamin Moore Product: Advanced (793) Finish: Semi-Gloss Color Name/Number: Decorator's White OC-149	Trims and Ceilings	All spaces
	Manufacturer: Benjamin Moore Product: ARBORCOAT Translucent Classic Oil Finish Finish: Flat (326) Color Name/Number: Natural (10)	Interior and Exterior glulam beams and structures	



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PAINT/STAINS	DESCRIPTION	LOCATION	NOTES
  	Manufacturer: Benjamin Moore Product: Element Guard® Exterior Paint (763) Finish: Flat Color Name/Number: Atrium White OC-145	Exterior Wall Panels	1. Full exterior Event Space
	Manufacturer: Benjamin Moore Product: Element Guard® Exterior Paint (763) Finish: Soft-Gloss Color Name/Number: Atrium White OC-145	Covered Exterior Walls	1. Even Space 2. Senior Housing 3. Residential
	Manufacturer: Benjamin Moore Product: ARBORCOAT Translucent Classic Oil Finish Flat (326) Color Name/Number: Natural (10)	Interior and Exterior glulam beams and structures	
Paints, stains and colors chosen to be neutral in order to blend in with the neighborhood and the context of the site. The temperate climate of Arroyo Grande, as well as the low height of the neighborhood allows the color to bounce around the space, making it feel welcoming to guests, as well as future residents.			



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A 5.0 STRUCTURAL SYSTEMS



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A5.0
STRUCTURAL
SYSTEMS



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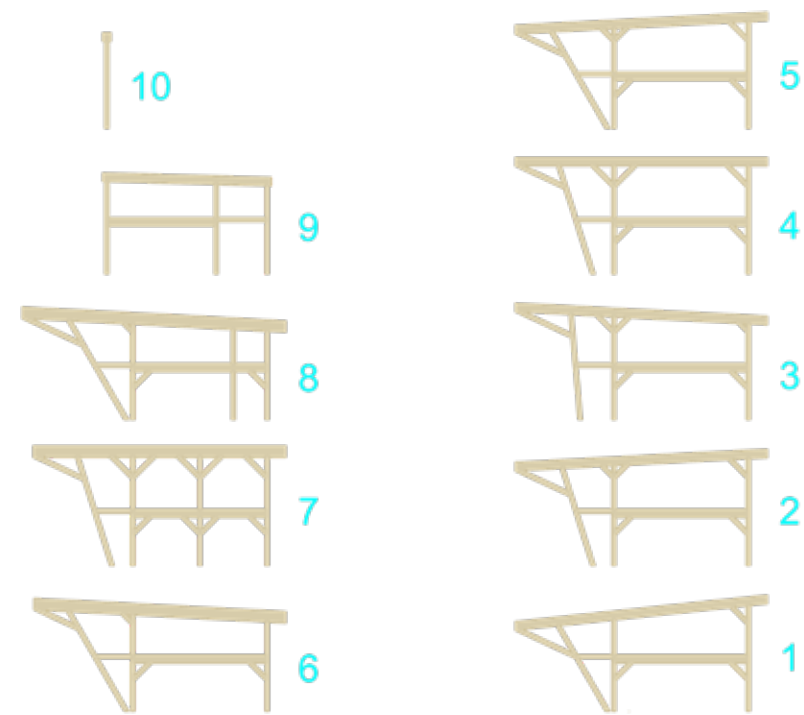
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Each subsequent frame was designed to undulate the roof, connecting the building to the hill in the back of the site. Each model from the front of the site on East Cherry, to the back of the site facing the hill follows this logic.



The shared kitchen's roof follow's the undulating logic of the public space and follows to the residential building.



The framing of the multi-family residential building is at the end of the radiating grid at the edge of the site.



Due to their smaller sizes, the meeting space canopy can be rotated to the sun for maximum coverage throughout the day.



The senior residential roof is following the grid from the public building on E Cherry and connects to the farming happening on the ground.



Arroyo Grande Village

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Team:
Arjay Jimenez
David Locon
Henry Asare

Date:
January 10, 2024



Arroyo Grande
Village

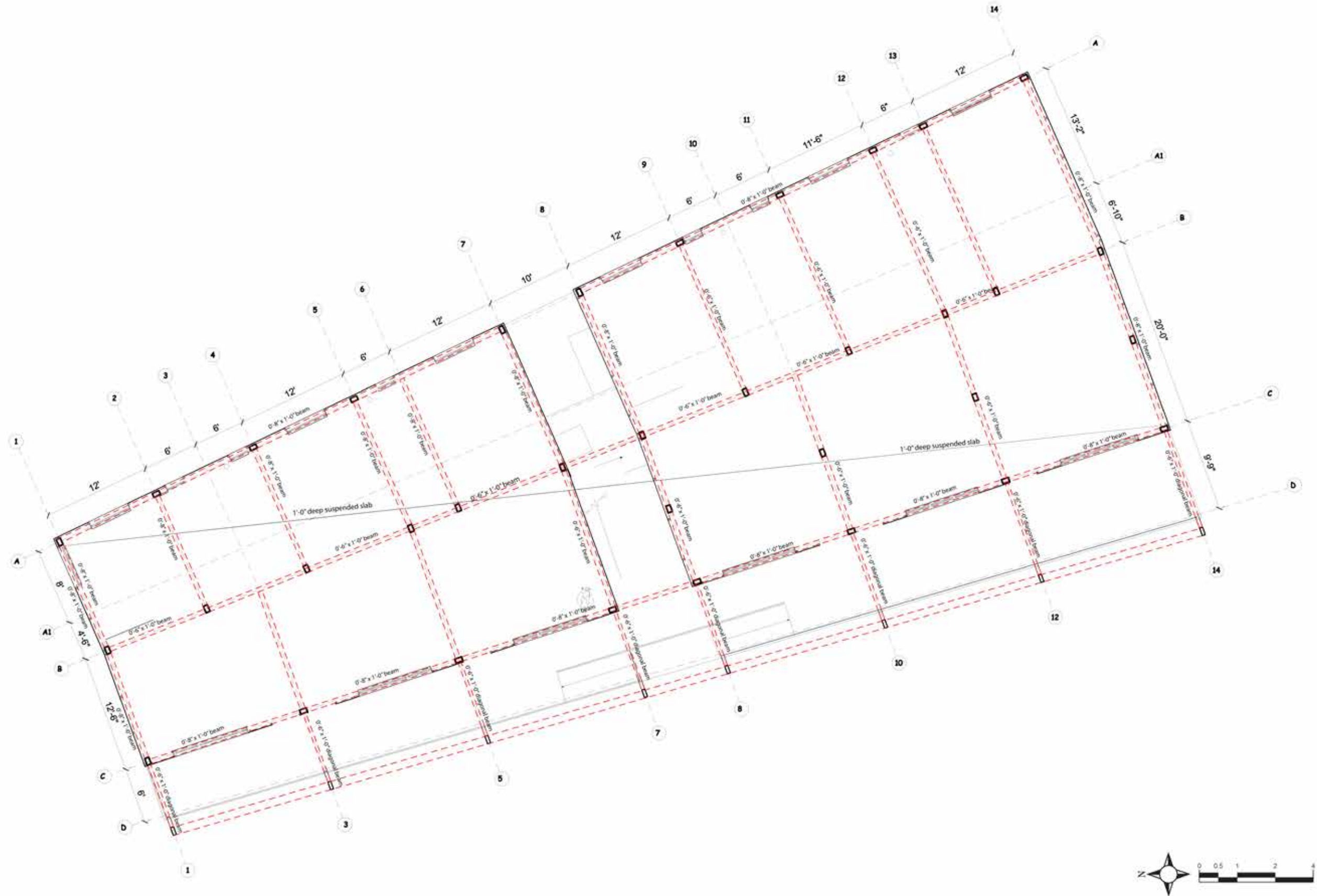
**BENJAMIN
MOORE FUTURE
OF DESIGN
CHALLENGE**

Fall 2023
ReGeneration
Studio

Instructors:
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Arroyo Grande
Village

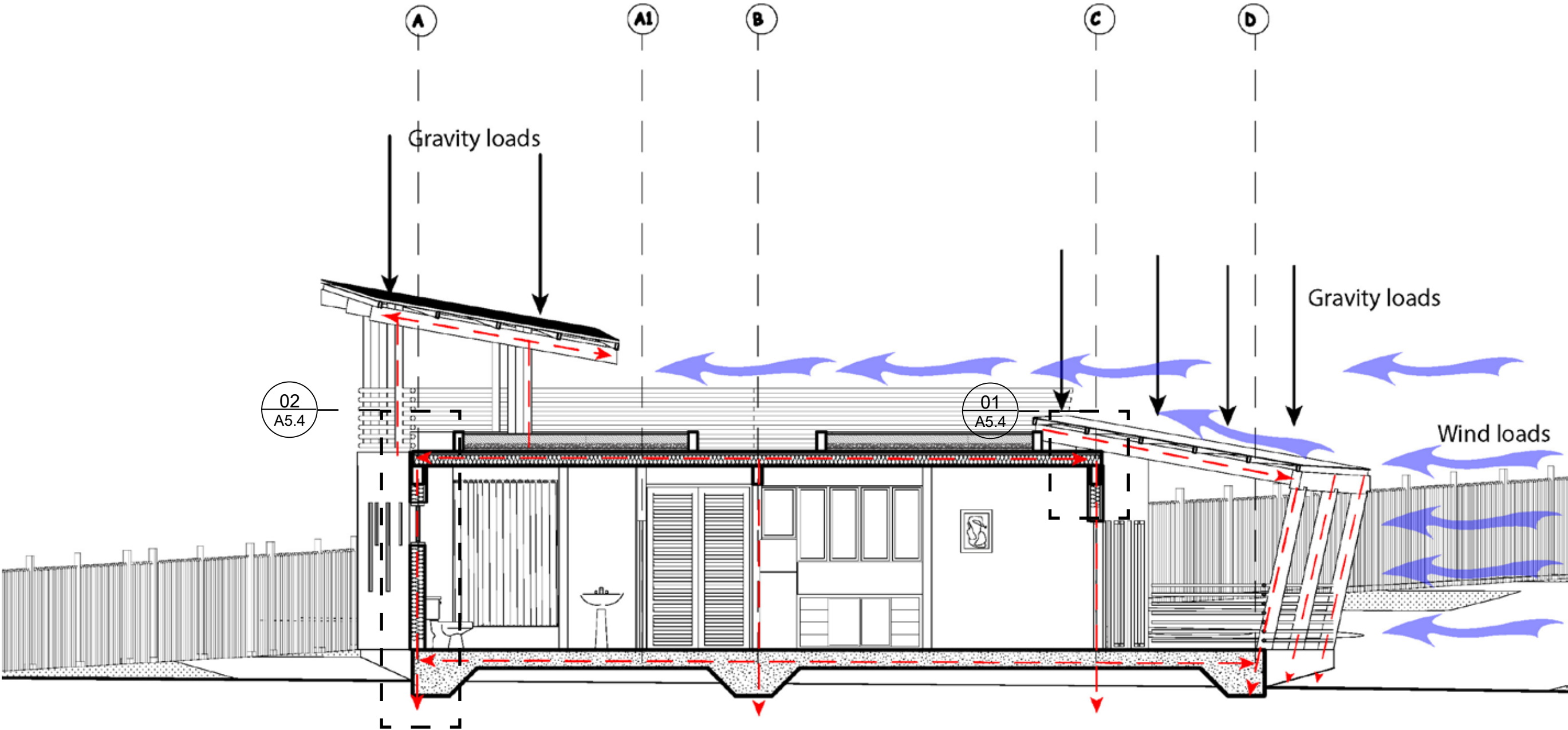
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01 SENIOR RESIDENTIAL BLOCK STRUCTURAL SECTION

A5.4
STRUCTURAL
SECTION



Arroyo Grande Village

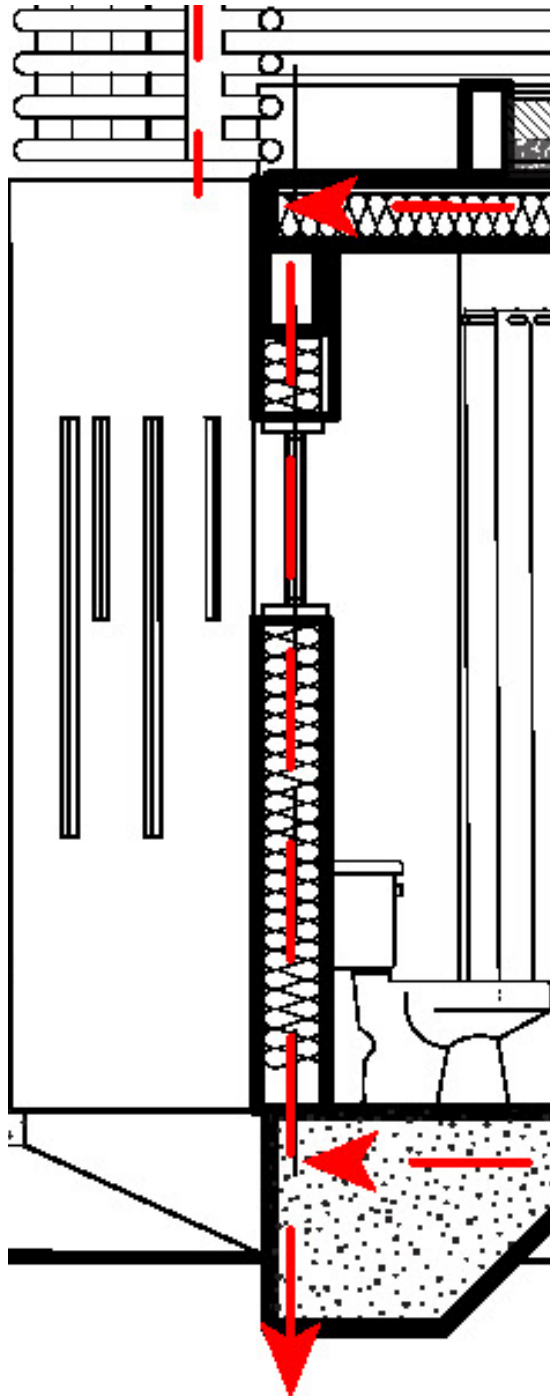
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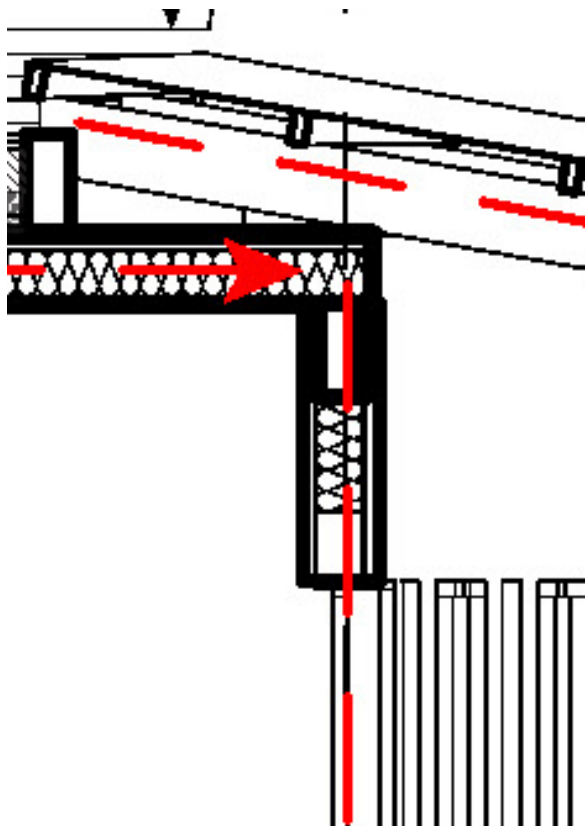
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02
A5.4 SR. RESIDENTIAL WALL



01
A5.4 SR. RESIDENTIAL ROOF DECKING

A5.5 STRUCTURAL DETAILS

A 6.0 ENVIRONMENTAL SYSTEMS



Arroyo Grande
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A6.0
ENVIRONMENTAL
SYSTEMS



Arroyo Grande Village

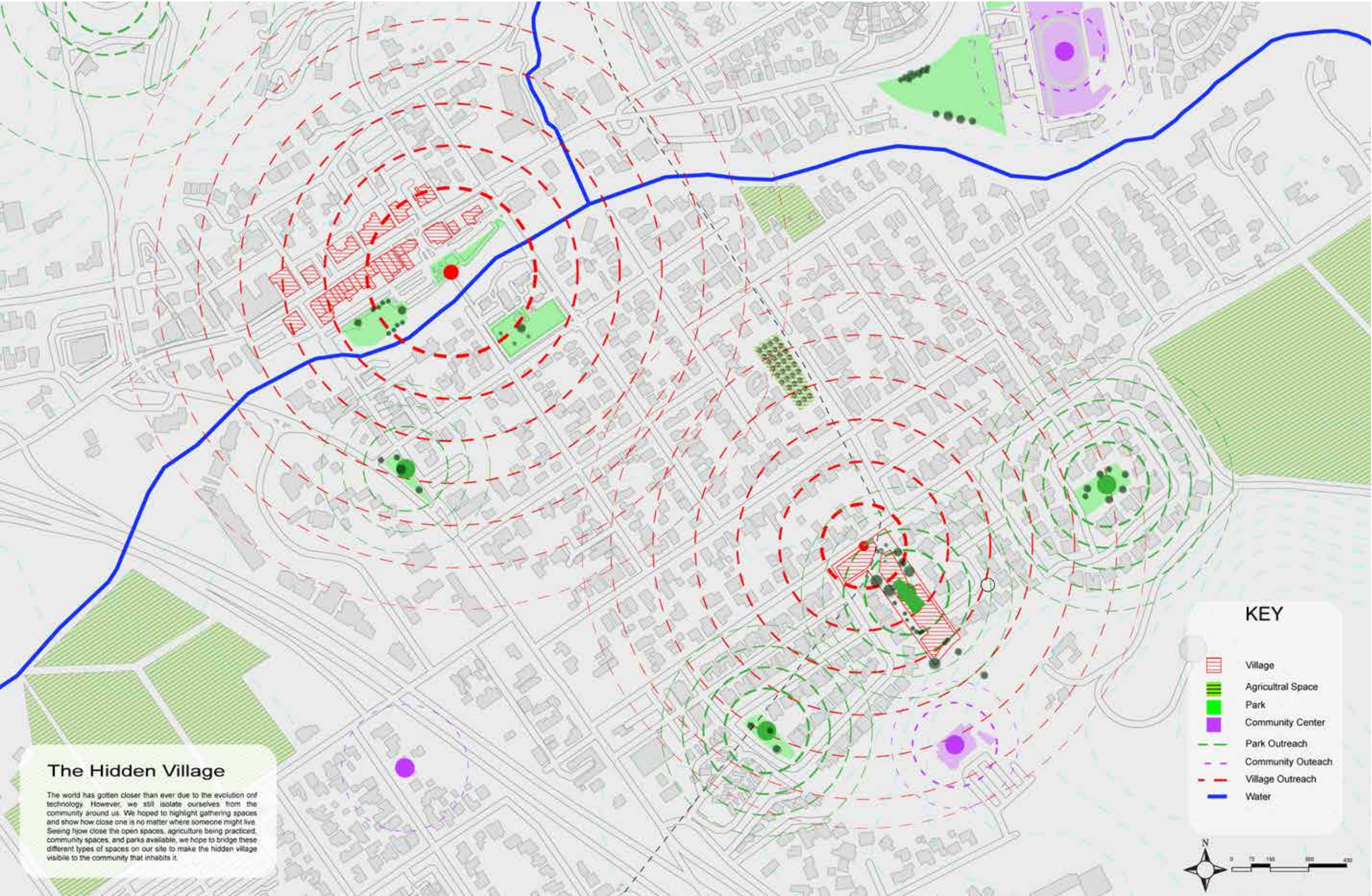
BENJAMIN MOORE FUTURE OF DESIGN CHALLENGE

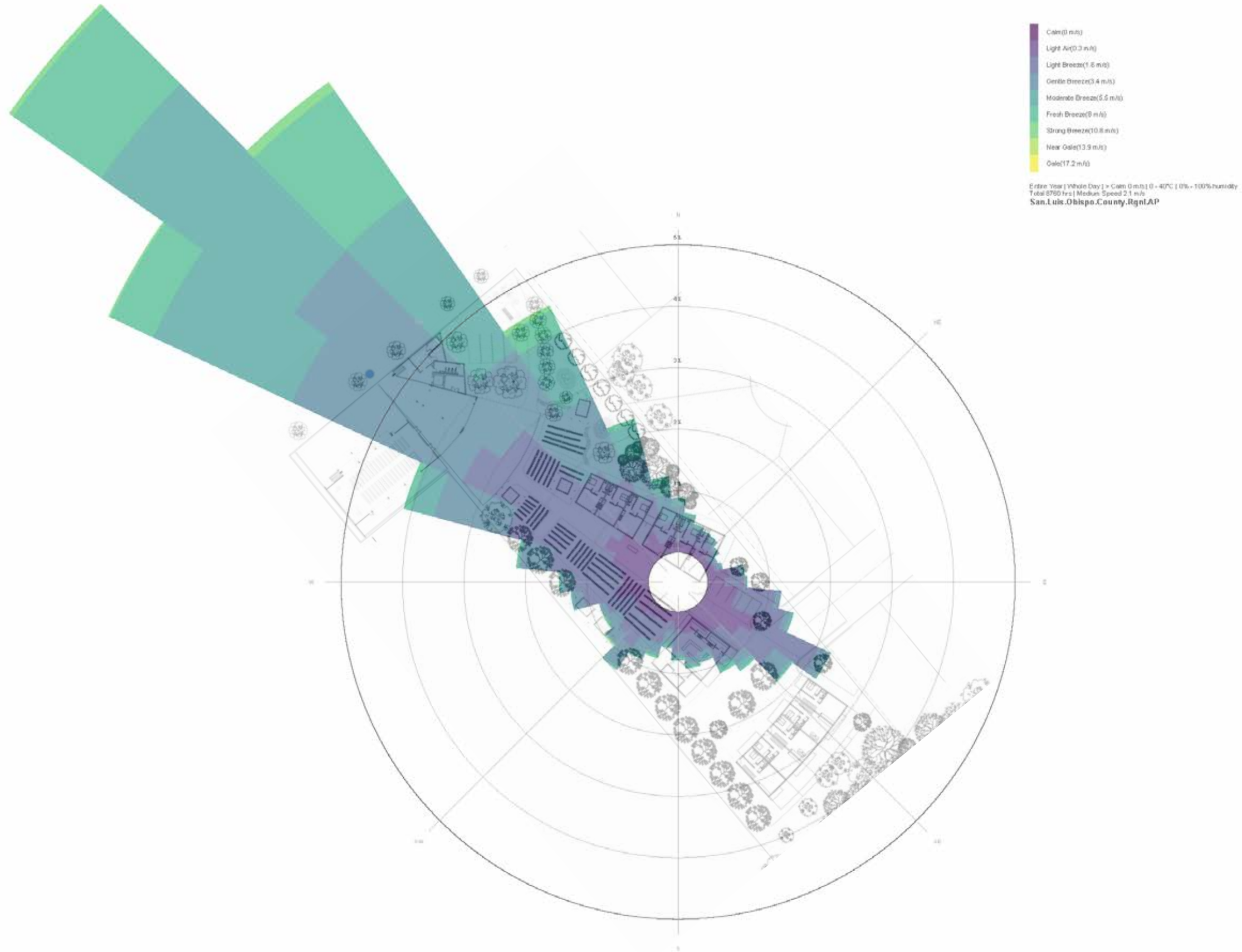
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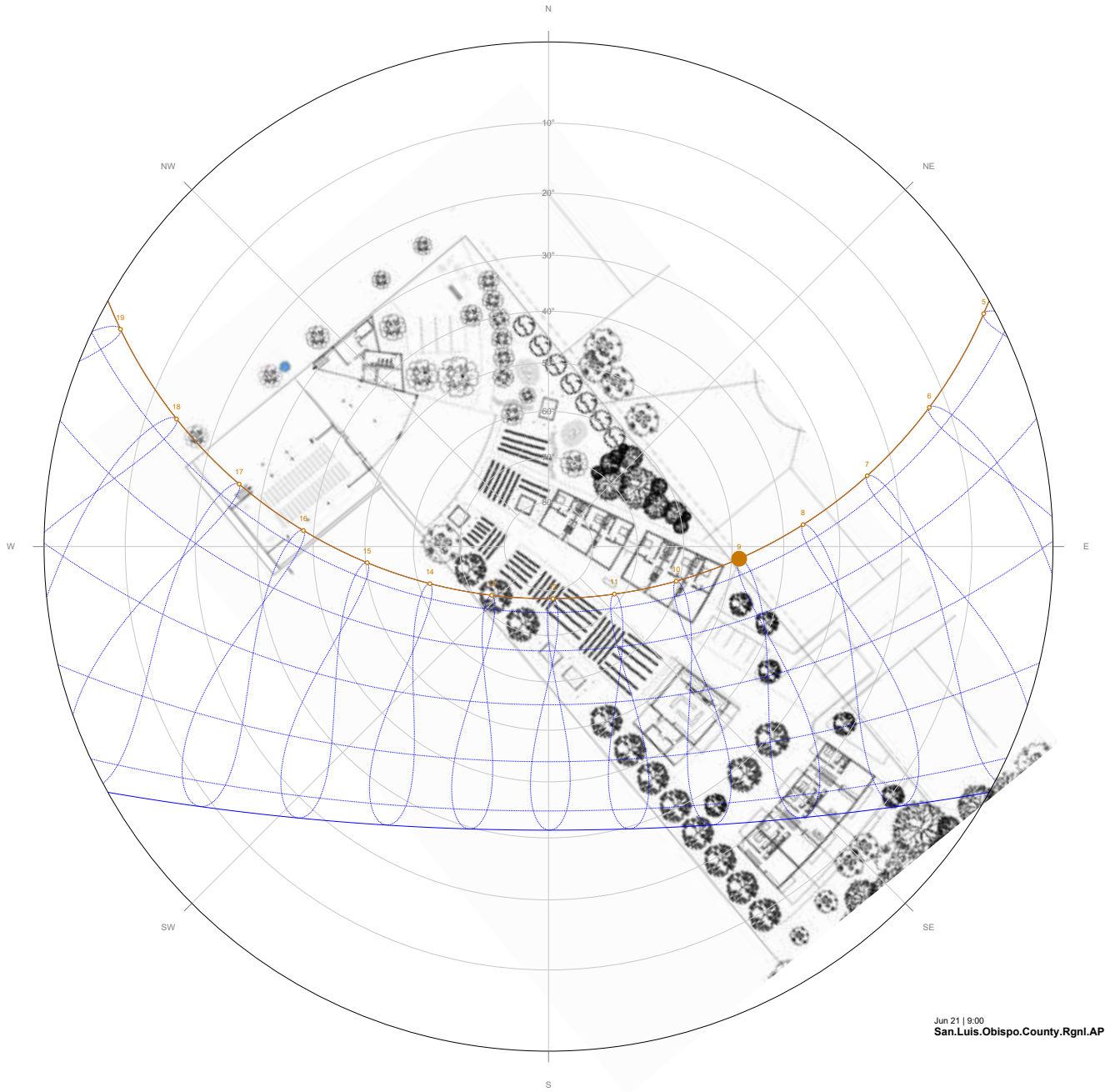
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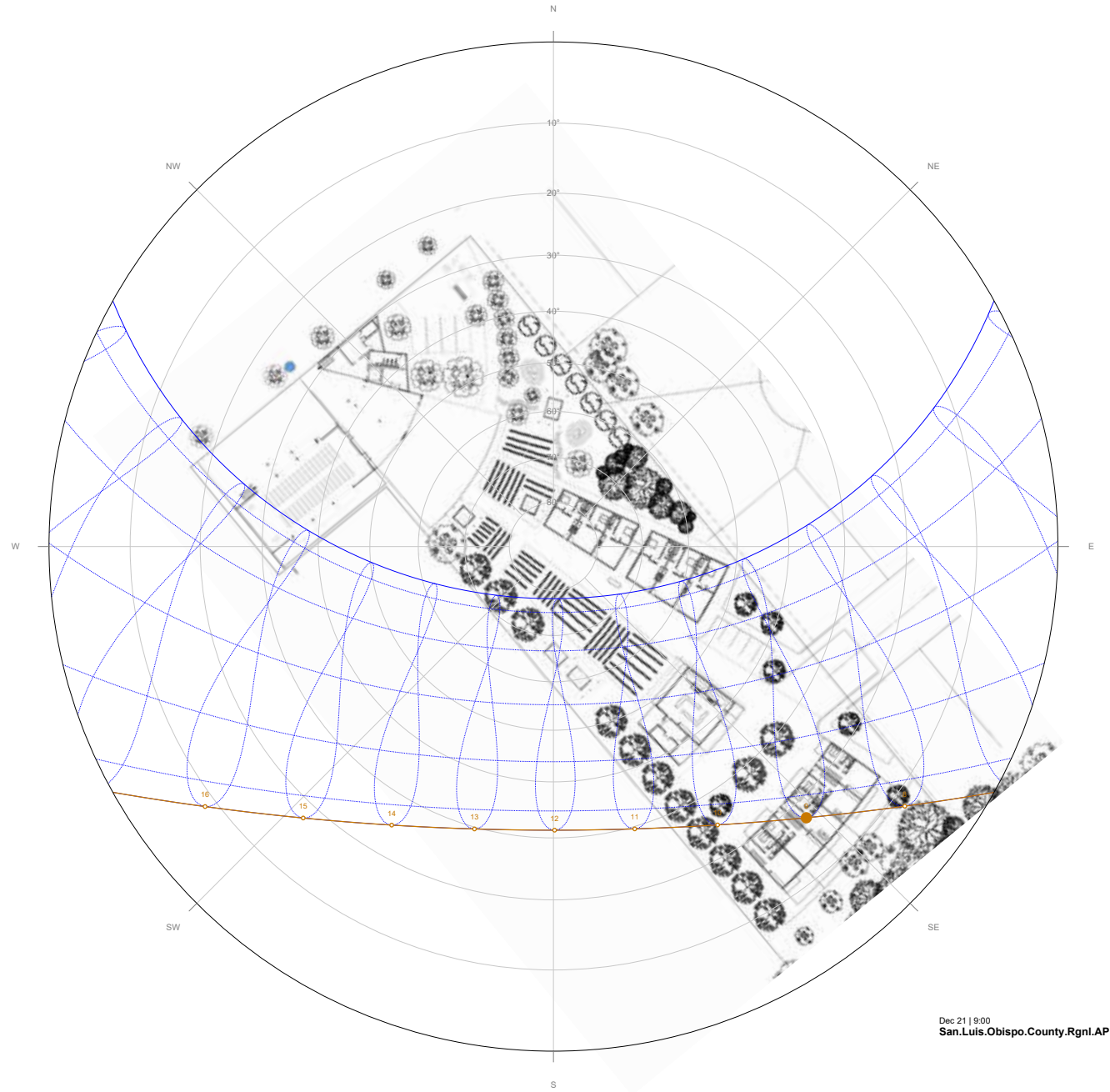
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A6.1.1
INTRODUCTION TO INTEGRATED SYSTEMS STRATEGY



02 SUMMER SUN PATH
SOURCE: CLIMATE CONSULTANT



01 WINTER SUN PATH
SOURCE: CLIMATE CONSULTANT



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Village

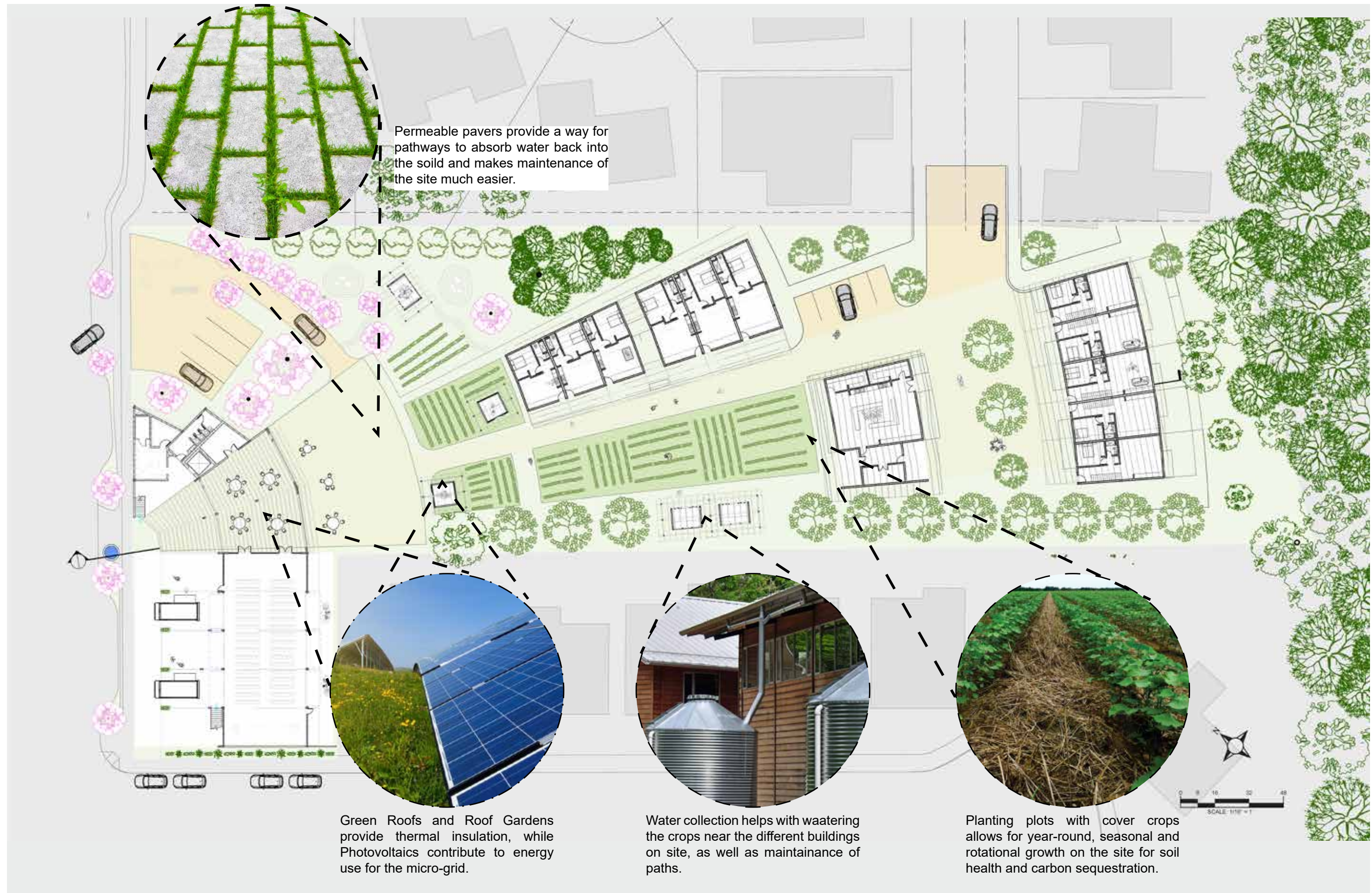
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Permeable pavers provide a way for pathways to absorb water back into the soil and makes maintenance of the site much easier.

Green Roofs and Roof Gardens provide thermal insulation, while Photovoltaics contribute to energy use for the micro-grid.

Water collection helps with watering the crops near the different buildings on site, as well as maintenance of paths.

Planting plots with cover crops allows for year-round, seasonal and rotational growth on the site for soil health and carbon sequestration.



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Village

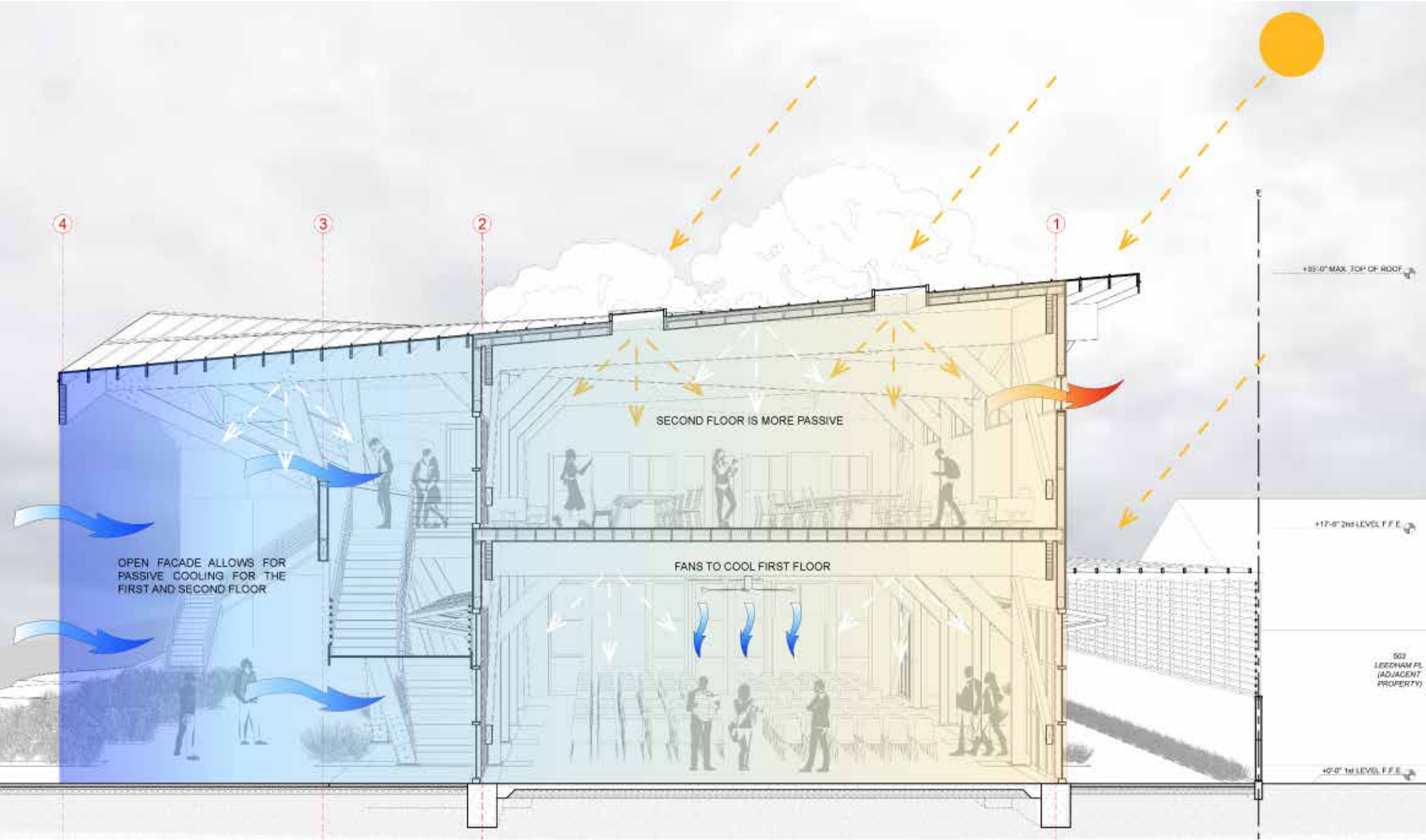
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01 INTEGRATED SECTION PERSPECTIVE

A6.3
INTEGRATIVE
SYSTEM
SECTION OR
SECTION
PERSPECTIVE



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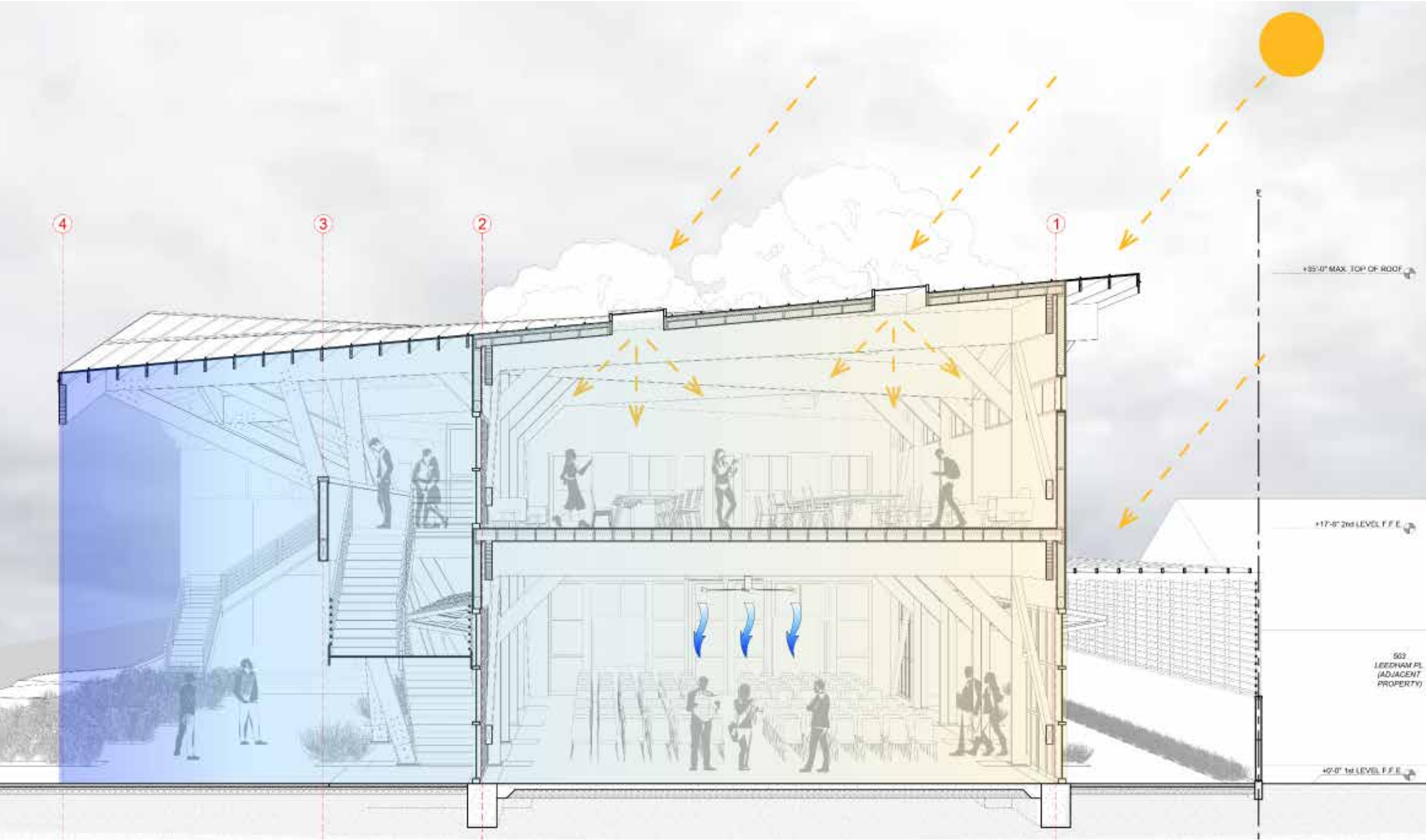
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01 SUMMER DAY LIGHTING

**A6.4
DAYLIGHTING
STRATEGY**



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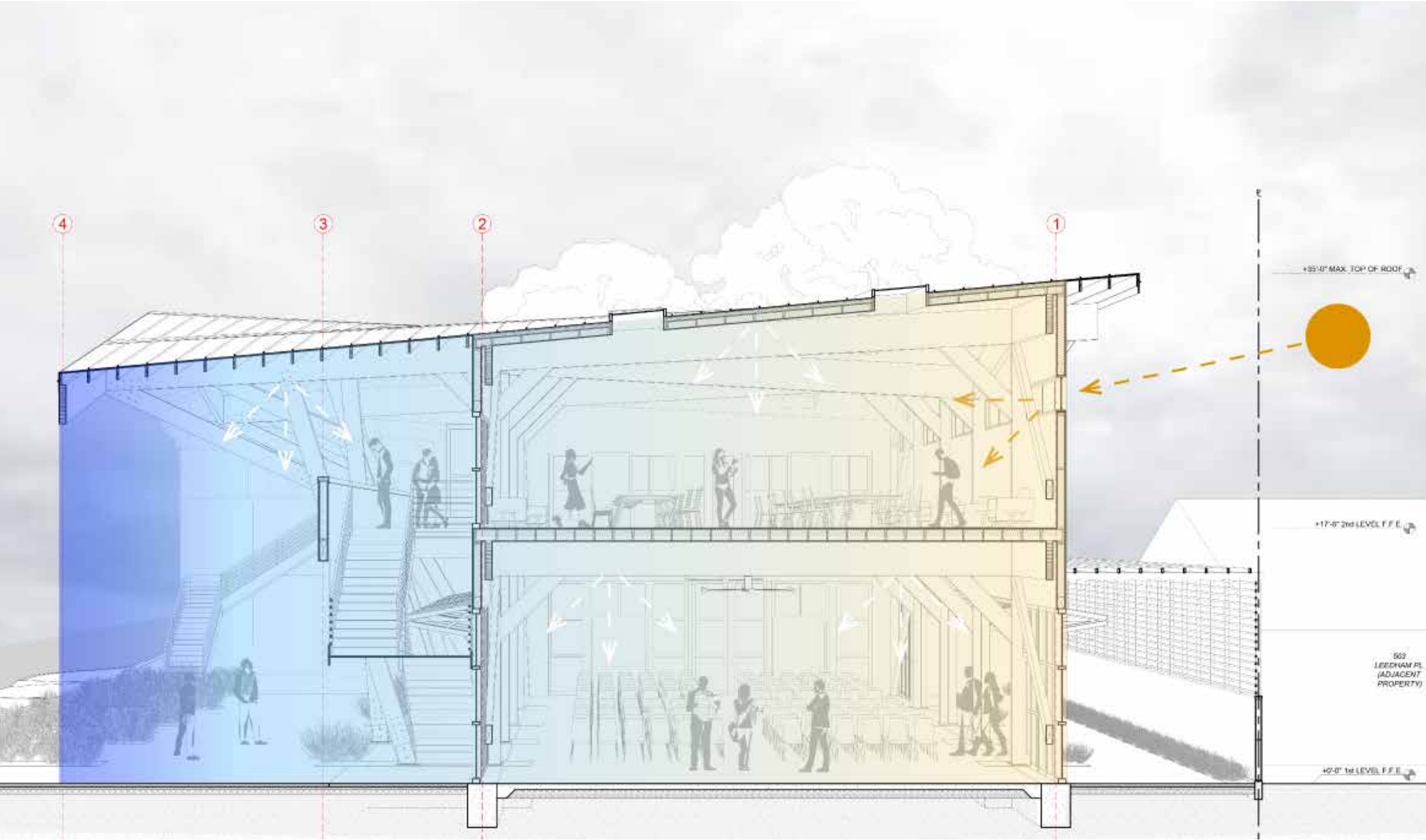
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01 WINTER DAY LIGHTING

**A6.4.1
DAYLIGHTING
STRATEGY**



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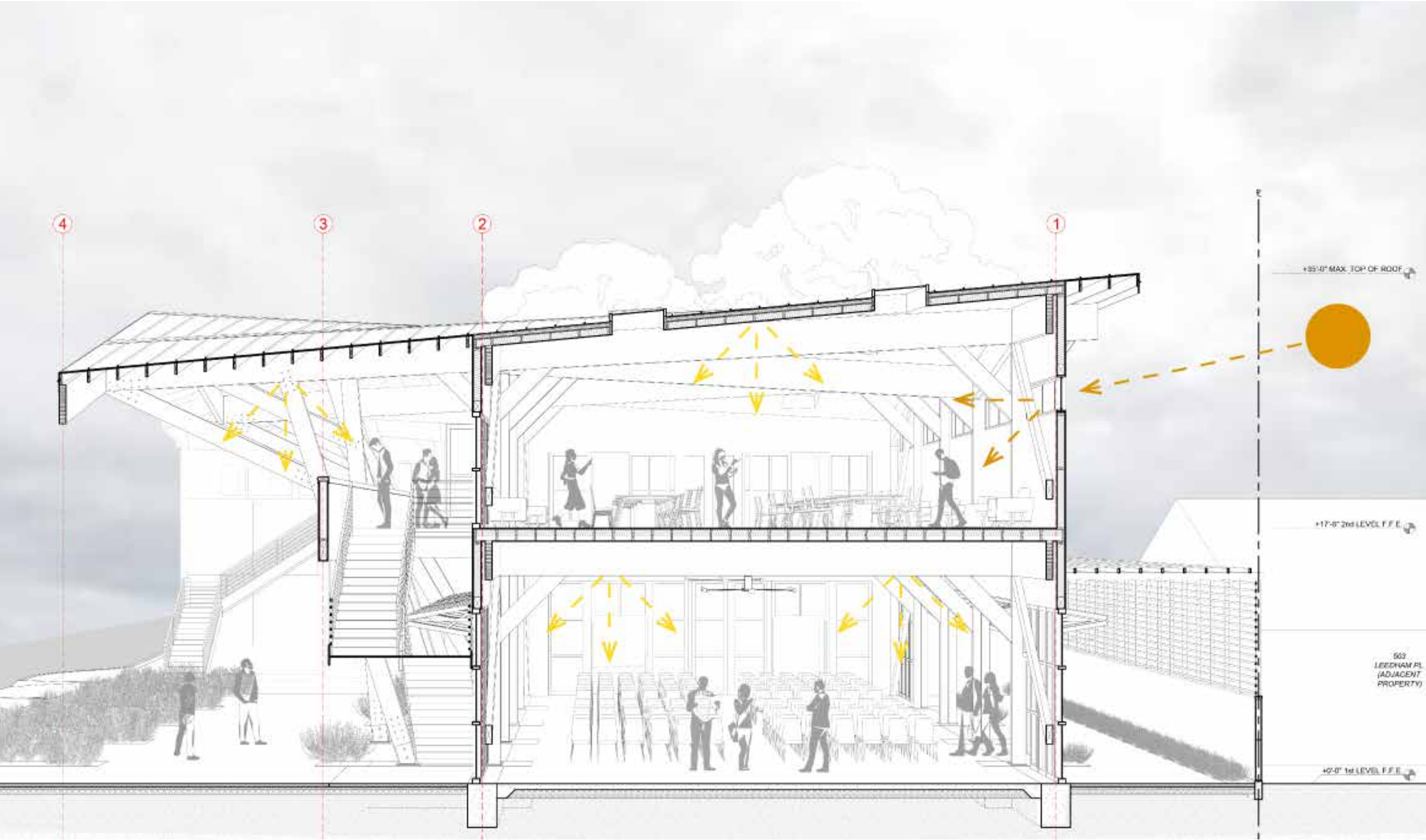
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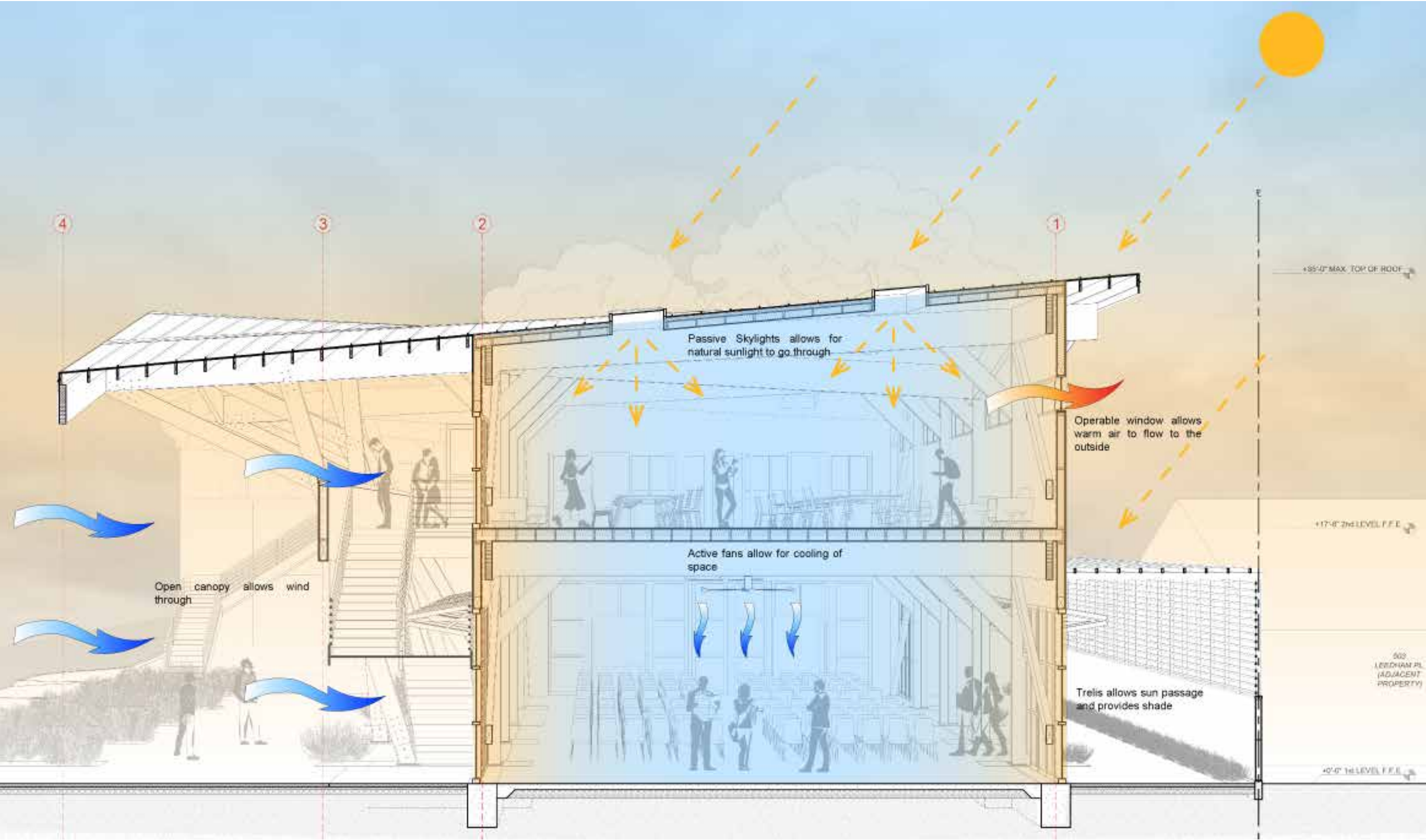
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01 PASSIVE COOLING

A6.5
THERMAL
PERFORMANCE
STRATEGY/
SECTION DETAIL



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Village

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OF DESIGN
CHALLENGE**

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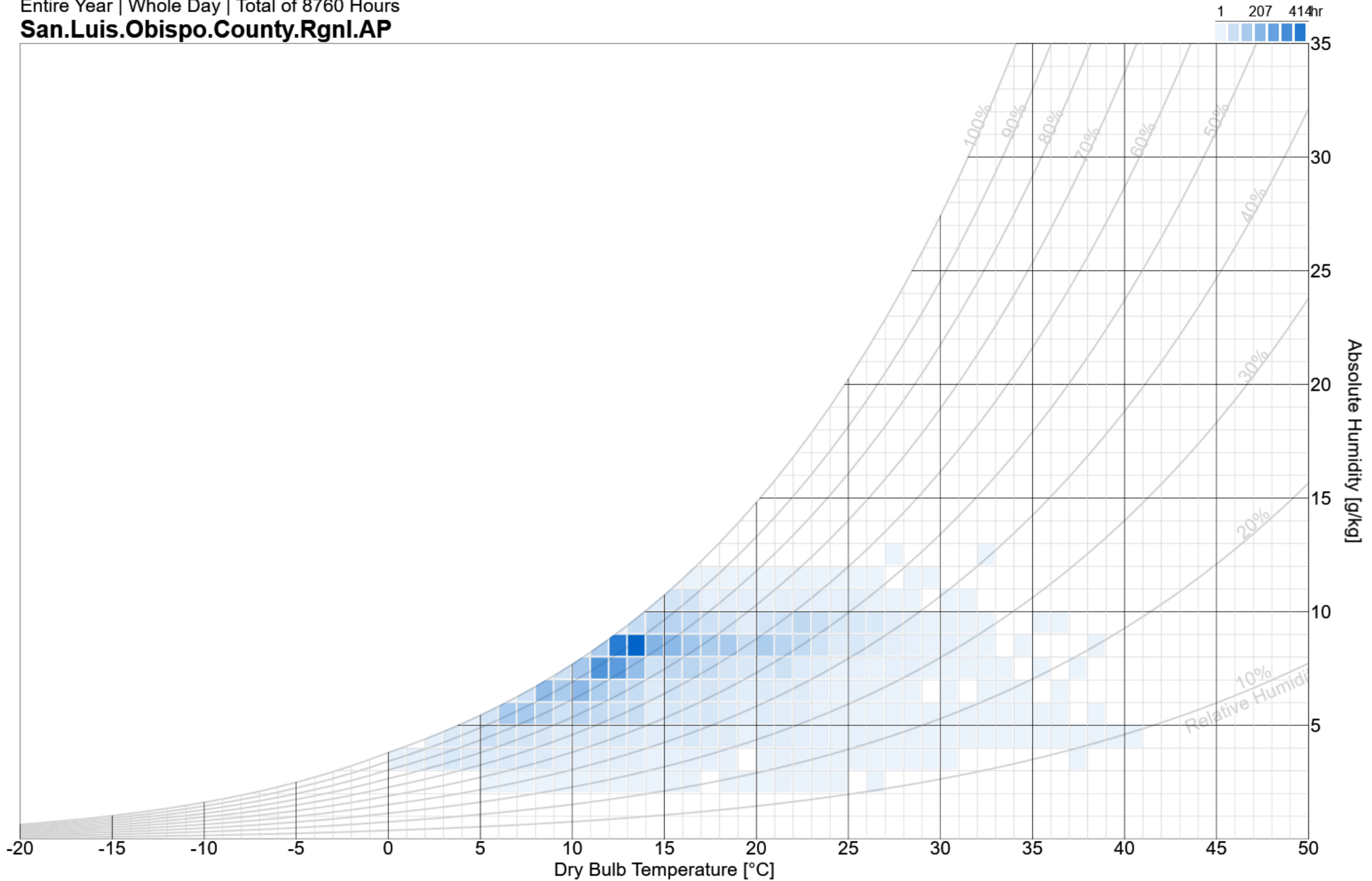
Instructors:
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A6.6
ECOLOGICAL
SYSTEMS

Entire Year | Whole Day | Total of 8760 Hours
San.Luis.Obispo.County.Rgnl.AP





Arroyo Grande
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Building lot coverage: 20.5%
Roof Garden: 2,256 sqft.
Agriculture Use: 6780 sqft

A 7.0 BUILDING ENVELOPE – MATERIAL & ASSEMBLY



Arroyo Grande
Village

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A7.0
BUILDING ENVE-
LOPE - MATERIAL
& ASSEMBLY



Arroyo Grande Village

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A7.1
MATERIAL & CONSTRUCTION DIAGRAMS



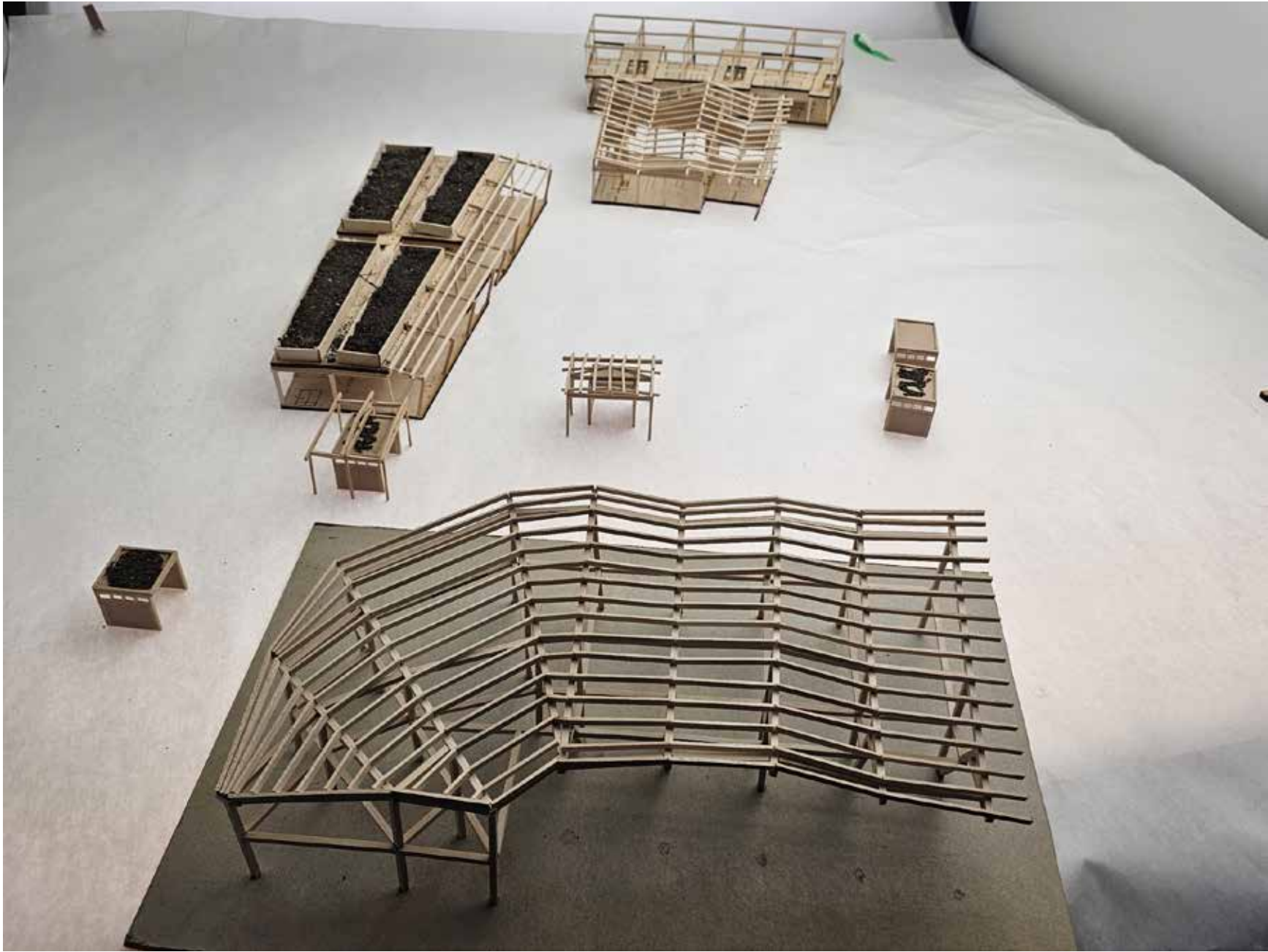
02 SENIOR LIVING SPACE



03 COMMUNITY KITCHEN



04 MEETING SPACE



01 SITE PLACEMENT



Arroyo Grande Village

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A7.2 CARBON CALCULATIONS

		Quantity (t)	ECF (kgCO2e/kg)			Embodied Carbon (tCO2e)			Total EC (tCO2e)	
			A1-A3	A4	A5w	A1-A3	A4	A5w	A1-A5w	
Reinforced concrete	Concrete	349.16	0.12	0.005	0.008	43.1	1.8	2.7	Reinforced concrete:	
	Rebar	1.7458	0.684	0.032	0.039				47.6	
Glulam Framing		42.25	0.263	0.005	0.010	11.1	0.2	0.4	Glulam frame:	
									11.7	
Aluminum		113.89	0.437	0.16	0.007	49.8	18.2	0.8	CLT roof slab:	
									68.8	
Structural Steel		1.18	1.518	0.005	0.010	1.8	0.01	0.01	Structural Steel	
									1.8	
									Total A1-A5w:	
									130.0	
									A5a:	
									5.6	
									Total A1-A5:	
									135.6	
									Sequestration:	
									-186.8	

Note: This calculation serves as an example of one way in which an engineer may choose to calculate the carbon on their project. Figures here are for the example carbon calculation presented in The Structural Engineer in July 2020. ECFs are derived in accordance with the article A Brief Guide to Calculating Embodied Carbon, from the same issue. Reuse with caution.



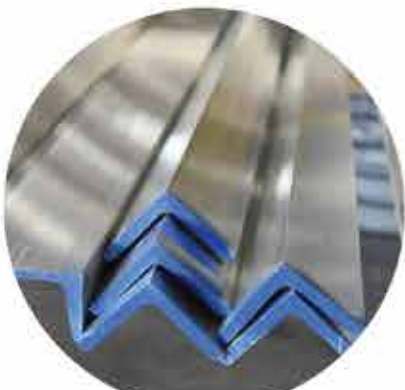
Glulam Pine Framing



Structural Steel



Reinforced Concrete



Aluminum Frames



Arroyo Grande Village

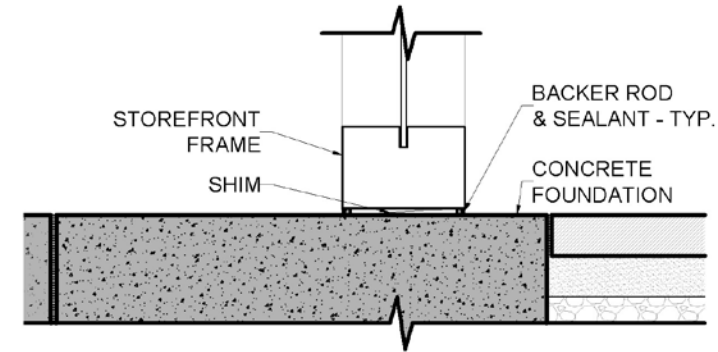
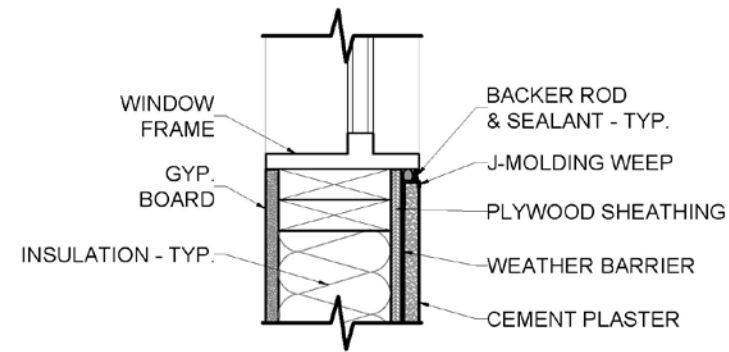
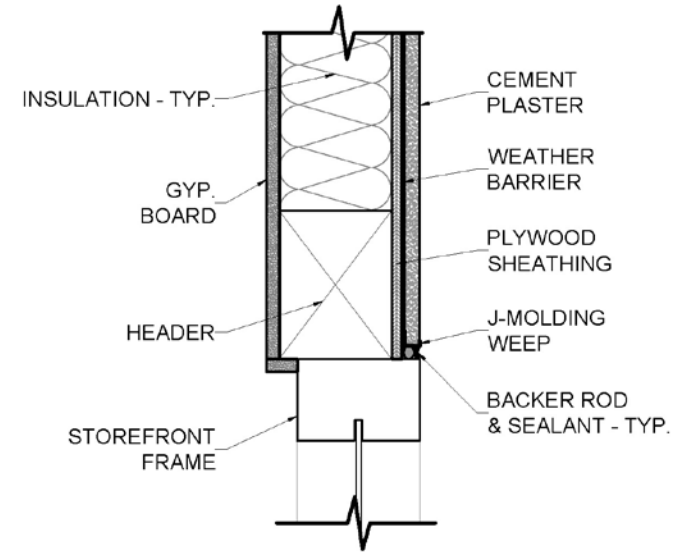
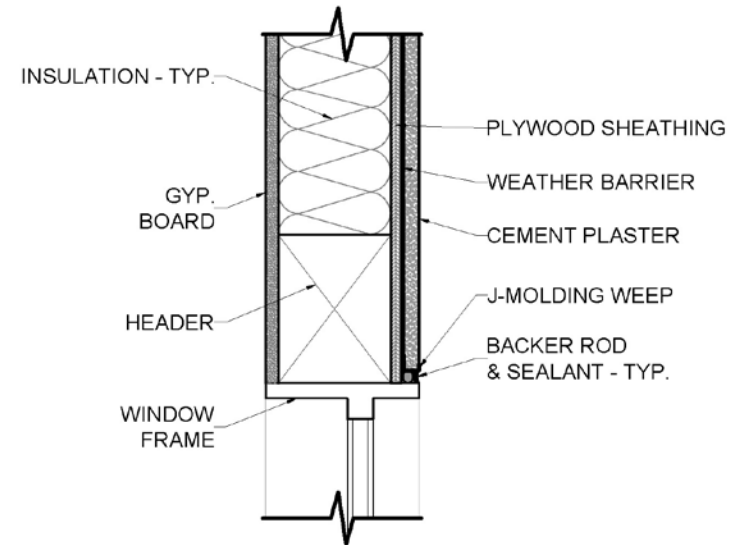
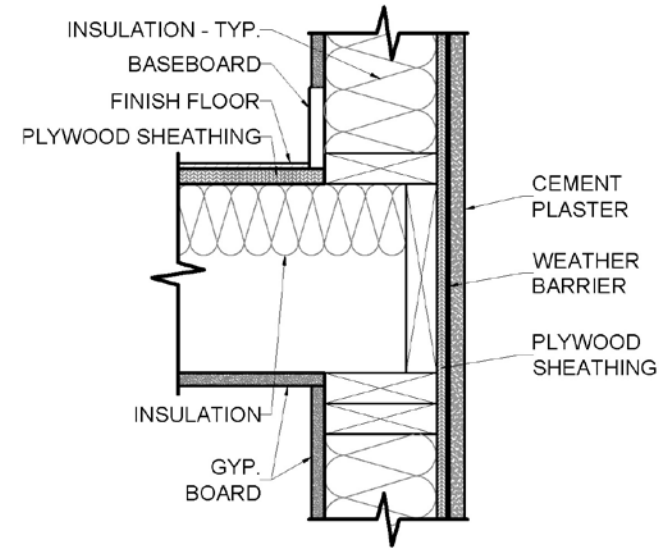
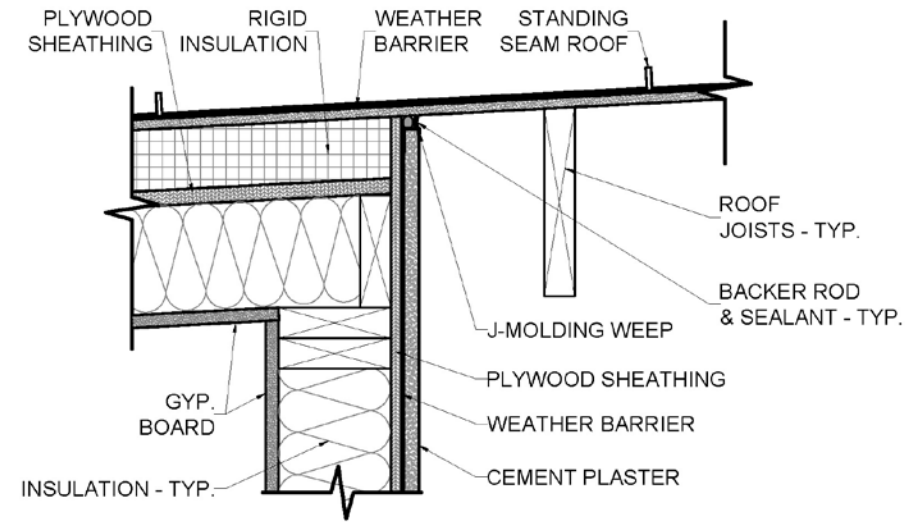
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A 8.0 PROCESS



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A8.0
PROCESS



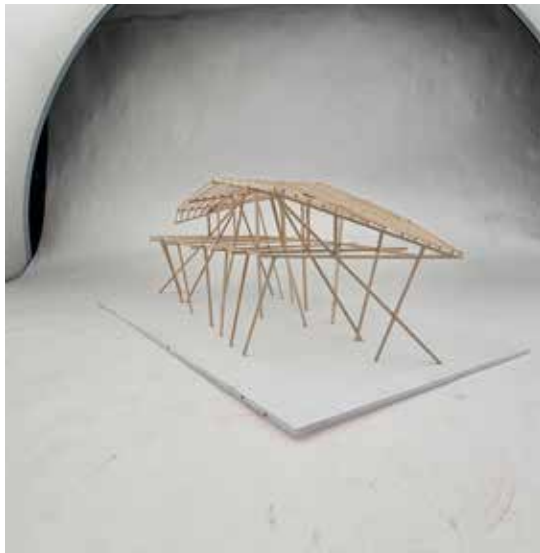
Very early one, we wanted to make simple bays with different roof structures. This one had the problem of too radical changes to be used.



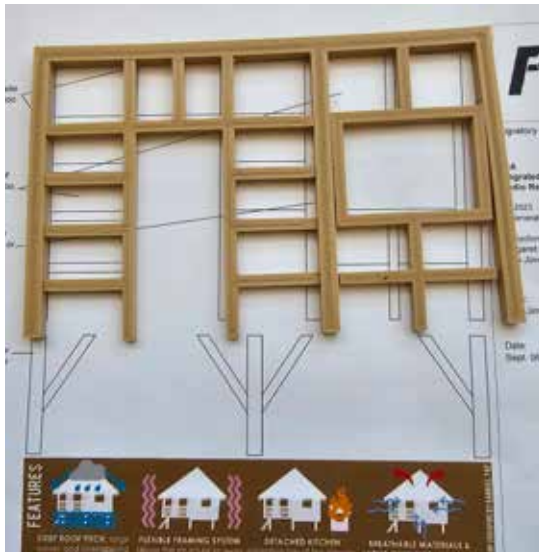
This was an experiment on parametric design.



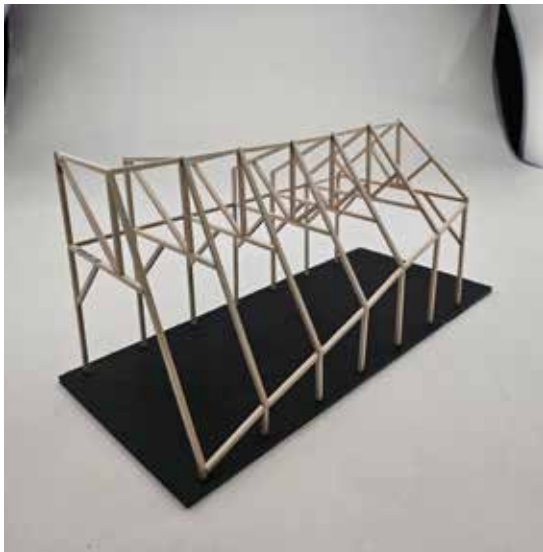
The same problem with this model as with the first. Too radical of a change between frames.



We ultimately landed on this structure that showed a lot of potential for different spaces, as well as a sheltered canopy for social gatherings.



An attempt at 3D Printing Frames.



This model inspired the structure found on the Senior Housing.



The same problem with this model as with the first. Too radical of a change between frames.



From this angle the roof shows how it connects to the hill at the back of the site.



Arroyo Grande Village

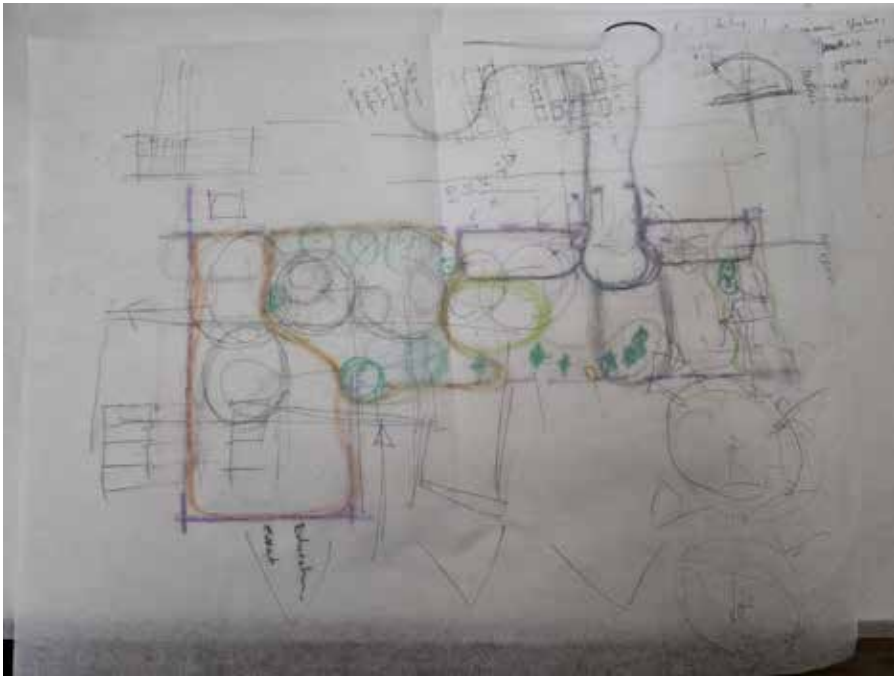
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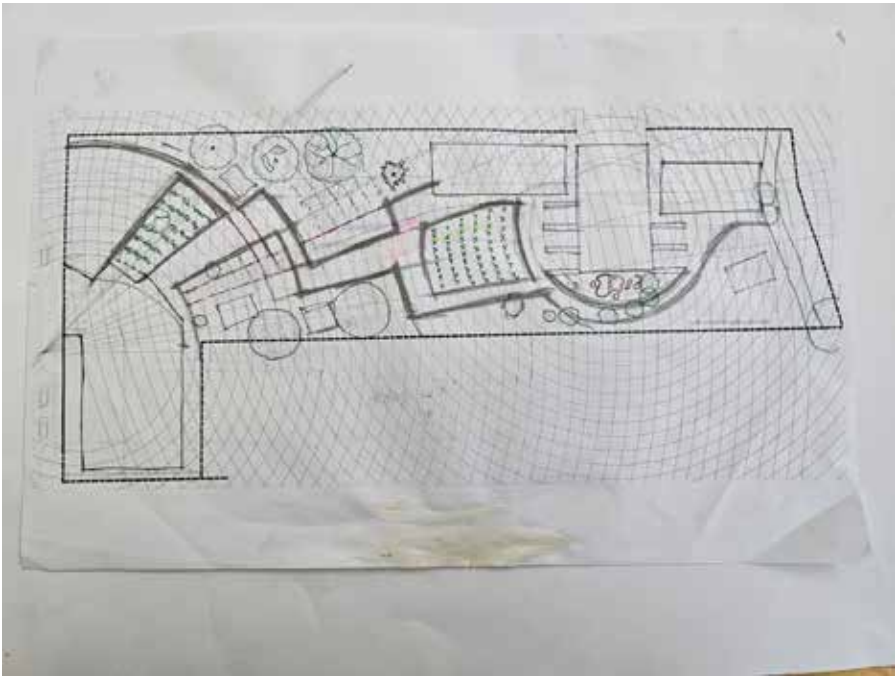
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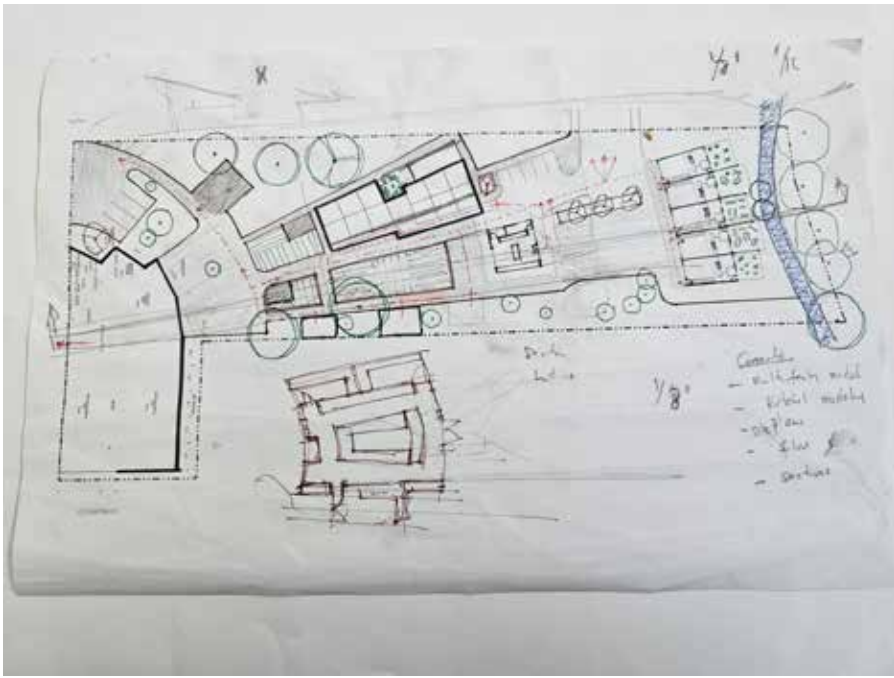
Our sketch on what we were looking to accomplish in the site, including generational spaces.



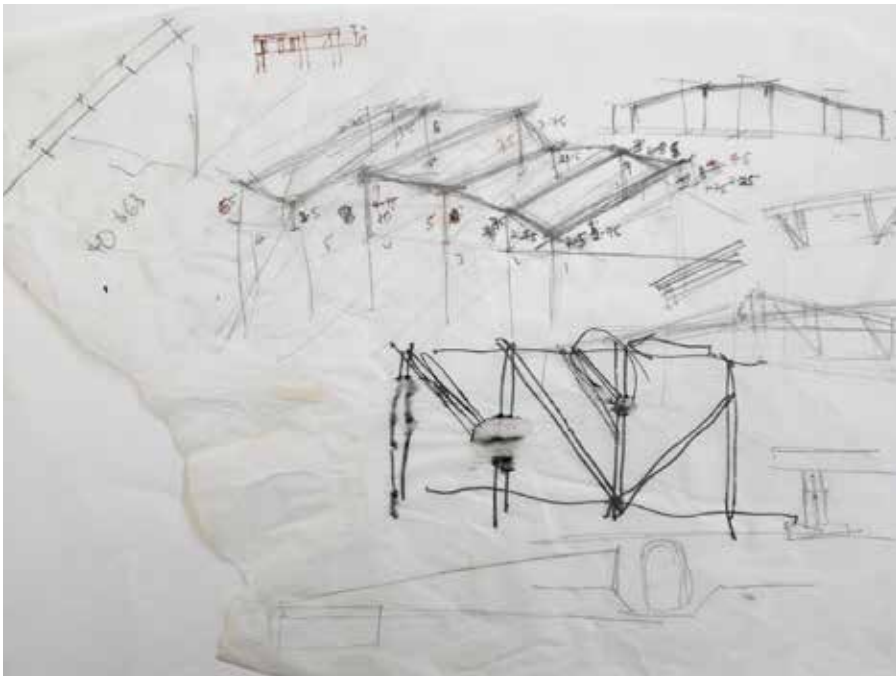
First Draft of Site Plan and Site Section



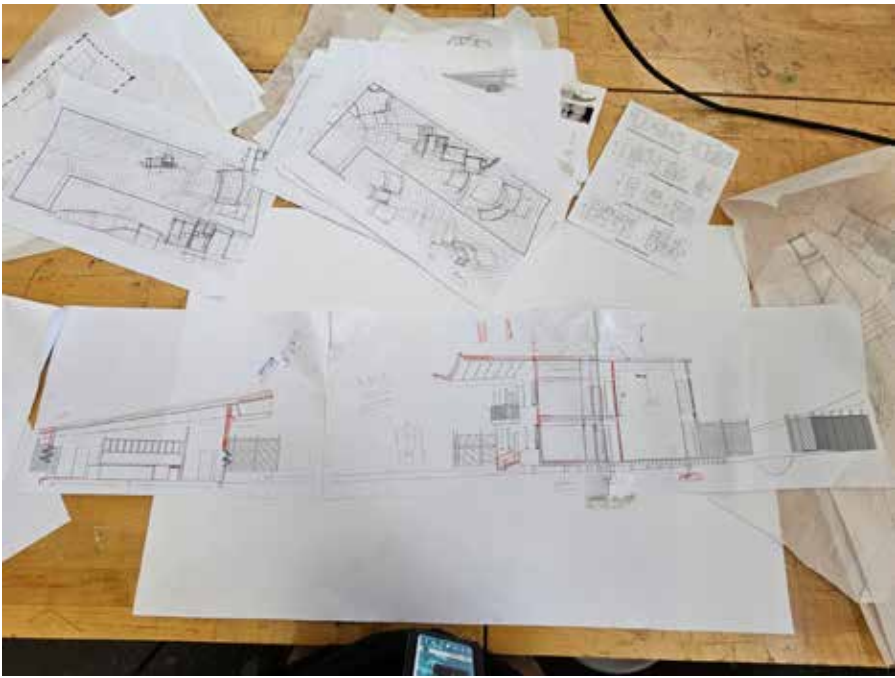
We decided on these concentric and radiating lines for our site grid. There were some things to work out such as how the public space curves or how the logic of the senior and multi family residences were clashing with the new site logic.



Finalized design of the site with new positions for the senior residents along the radiating lines and the multi-family space on the edge of the site to give some privacy.



Sketches of trying to figure out the roof structure.



Thinking about the site, we were trying to find out how different buildings interacted with one another.



Arroyo Grande Village

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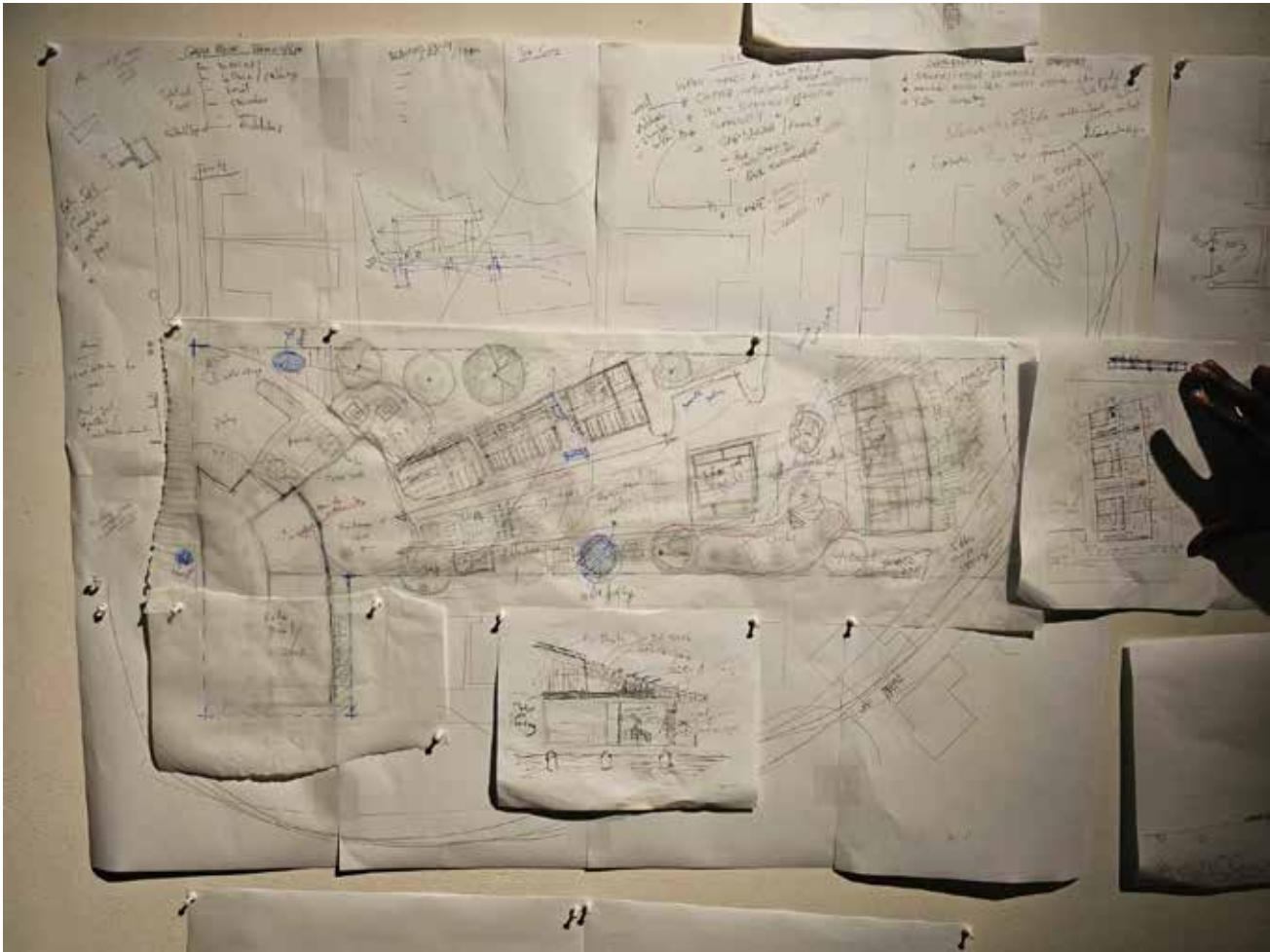
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Progress PinUp on October 26, 2023. Final Site Plan started to develop.



Progress PinUp on November 11, 2023. Buildings established from site plan grid



Consultation with Paul Mayencourt

Workshop 1:

We learned a lot about embodied carbon, as well how to calculate it based on material, how it's made and how it got to the site. Because the buildings on our site are mostly made from mass timber, we end up minimizing the amount of carbon we put into the air during construction.

Workshop 2:

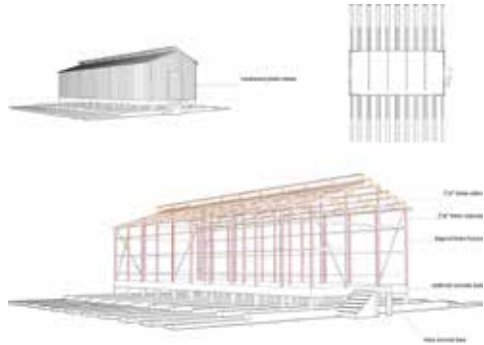
David's tectonic model was looked at to see what he can change to make it viable for glulam construction, as well how thick the beams and columns needed to be. The canopy for the senior and multifamily residentials were looked over to see how they can connect and communicate with each other while maintaining the roof structure established from the tectonic models

Workshop 3:

We looked at how columns were joined when using mass timber for construction. That same day, we were told to walk to the back lot of CCA to see how mass timber pavilions were getting constructed for reference.

		Quantity (t)	ECF (kgCO2e/kg)			Embodied Carbon (tCO2e)			Total EC (tCO2e)	
			A1-A3	A4	A5w	A1-A3	A4	A5w	A1-A5w	
Reinforced Concrete	Concrete	312.53	0.12	0.032	0.009	47.87	10.17	3.38	Reinforced concrete:	61.42
	Rebar	5.21	1.99	0.032	0.108					
Timber Framing		3.02	0.263	0.032	0.003	0.79	0.10	0.01	Timber frame:	0.90
Transparent Roofing Sheet		0.46	0.39	0.032	0.162	0.18	0.01	0.07	Transparent Cladding:	0.27
									Total A1-A5w:	62.59
									A5a:	5.60
									Total A1-A5:	68.19
									Sequestration:	-0.75

Note: This calculation serves as an example of one way in which an engineer may choose to calculate the carbon on their project. Figures here are for the example carbon calculation presented in The Structural Engineer in July 2020. ECFs are derived in accordance with the article A Brief Guide to Calculating Embodied Carbon, from the same issue. Reuse with caution.



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**A8.4.2
CONSULTANT
WORKSHOP 1,
ENVIRONMENTAL
SYSTEMS**



Consultation with Isabelle Hens, Atelier Ten

Workshop 1

We learned about different ways to restructure David’s tectonic model to make room for gathering and how to frame the site for farming.

Workshop 2

We talked about how our site is coming along as well as where we might be able to utilize water collectiona and energy management.

Workshop 3

Last consultation and we checked in on how the senior residential units can have farming on the roof with the solar panels included.



Consultation with Edlyn Garcia, Morrison Hershfield

Workshop 1

We asked how solar panels can be incorporated into the site and were directed to Climate Consultants to find ra-
diation maps. Passive solar lighting was discussed with consideration to how much our roofs go beyond the walls
of the buildings.

Workshop 2

Using Climate Consultants again, we looked at passive cooling, specifically wind roses of Arroyo Grande to see
where we can utilize the wind to cool off the public building. David’s multi-faceted rolling door was changed to a
dual folding door.

Workshop 3

We talked about green roofs and how they are good insulation to buildings, as well as how thick the ceiling has to
be in order to support it.

FIRE SAFETY OBJECTIVES OF THE CODES

- Protection of occupants
- Egress/Defend in Place
- Protect structure
- Maintain structural integrity
 - Protect against fire spread
 - External
 - Internal floor-to-floor spread
 - Protect neighboring structures
- Provide access and safety for fire fighting
- Safe Access to Fight Fires



Determining Minimum Construction Type With Multiple Occupancy Groups: Two Approaches

APPROACH 1: Non-Separated Occupancies

Apply worst case governing Occupancy Group to your area and height to determine Construction Type as Single Occupancy

If A-3 and B: A-3 governs as it is more restrictive (smaller) so use A-3 height/area to determine your construction type. If you comply with A-3 height/area for the construction type you comply with B as well, no fire separations between occupancies needed.

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A-3	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM (without height increase)	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
	SM (with height increase)	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
B	NS	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000	27,000



Arroyo Grande Village

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A8.5
FIRE SAFETY
CONSULTATION

MASS TIMBER FIRE RESISTANCE

BUILDING ELEMENT	TYPE IV			
	A	B	C	HT
Primary structural frame ^f (see Section 202)	2 ^a	2 ^a	2 ^a	HT
Bearing walls				
Exterior ^{e, f}	3	2	2	2
Interior	3	2	2	1/HT ^a
Nonbearing walls and partitions	See Table 602			
Exterior				
Nonbearing walls and partitions				See Section 2304.11.2
Interior ^d	0	0	0	
Floor construction and associated secondary members (see Section 202)	2	2	2	HT
Roof construction and associated secondary members (see Section 202)	1 1/2	1	1	HT

It's both interesting and kind of relieving to know that in practice, the building is technically already designed given all the code one has to follow. While there are exceptions to the rules. It's nice to know that there are always constraints to follow whenever a new construction project is proposed.

We all found it fascinating how having a sprinkled system opens up so much possibility and freedom when it comes to building facade and materials.

Since our building is mostly mass timber construction, we decide on a sprinkler system to allow us a facade that is open and inviting to people. Having the sprinkled system allows for more than a 200% increase in facade space that can be open to the public.



Arroyo Grande Village

BENJAMIN MOORE FUTURE OF DESIGN CHALLENGE

Fall 2023
ReGeneration Studio

Instructors:
Margaret Ikeda
Evan Jones

Team:
Arjay Jimenez
David Locon
Henry Asare

Date:
January 10, 2024

**A8.6
REGENERATIVE
AG: FARMERS &
FOOD**



Important Lessons Learned

1. When adding organic matter to soil, it increases carbon sequestration and its ability to hold water. This also helps with soil health and fertility.
2. Farmers can make many tiny steps to replace damaging farming practices
3. Farmers generally talk to other farmers and trust them with information on new practices.

About
Mission-driven brand leader, passionate about building teams and organizations to create the future we envision. Experienced in strategy, global brand building, organizational leadership, stakeholder engagement, innovation, commercialization, culture change, and people development. Combines Fortune 500 (P&G, The Clorox Company, Intuit, FCB) and entrepreneurial experiences to create purpose-driven growth and generate outstanding financial, social, and environmental results.

How we work has forever been transformed by a global pandemic, the undeniable climate crisis, and social equity and justice demands. To do great work that serves us all requires equal parts empathy, humility, aspiration, bravery, and committed collaboration -- traits I nurtured growing up, I admire in others, and I strive to live and work by.



In collaboration with Bill Littman's class, we learned about the Japanese incarceration during World War II in California. Families were forced out of their homes and into camps where some formed a familiar village despite the tragedy that was going on. It was shocking to us that despite the war being over, the conditions of some of the families had not improved due to the fact that their property may have been taken over by other people, or has flat out been destroyed by their neighbors. Furthermore, we learned of stories of families burying items in their homes in the hopes of being able to get it back once the war was over, as the amount of things that can be brought to the camps was limited. Overall, the dark mark on American History when it saw its own citizens incarcerated will not be forgotten and we hope that something of this nature will not happen again in the future.



Arroyo Grande
Village

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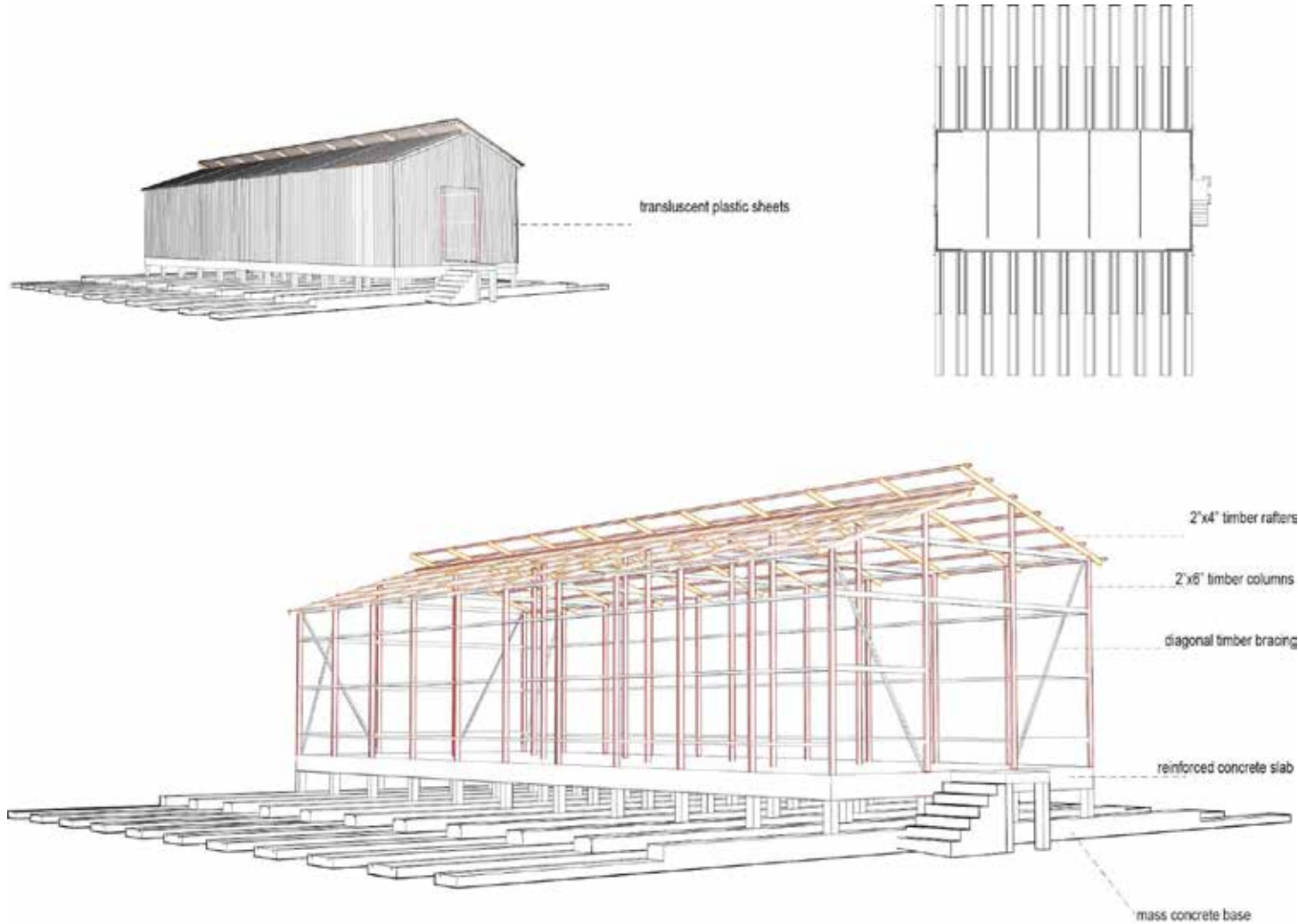
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Date:
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A8.7
JAPANESE
AMERICAN
HISTORY

		Quantity (t)	ECF (kgCO2e/kg)			Embodied Carbon (tCO2e)			Total EC (tCO2e)	
			A1-A3	A4	A5w	A1-A3	A4	A5w	A1-A5w	
Reinforced Concrete	Concrete	312.53	0.12	0.032	0.009	47.87	10.17	3.38	Reinforced concrete:	61.42
	Rebar	5.21	1.99	0.032	0.108					
Timber Framing		3.02	0.263	0.032	0.003	0.79	0.10	0.01	Timber frame:	0.90
Transparent Roofing Sheet		0.46	0.39	0.032	0.162	0.18	0.01	0.07	Transparent Cladding:	0.27
									Total A1-A5w:	62.59
									A5a:	5.60
									Total A1-A5:	68.19
									Sequestration:	-0.75

Note: This calculation serves as an example of one way in which an engineer may choose to calculate the carbon on their project. Figures here are for the example carbon calculation presented in The Structural Engineer in July 2020. ECFs are derived in accordance with the article A Brief Guide to Calculating Embodied Carbon, from the same issue. Reuse with caution.



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A8.8
EMBODIED
CARBON
CALCULATIONS



Pinning down after a workshop



Video outtake



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