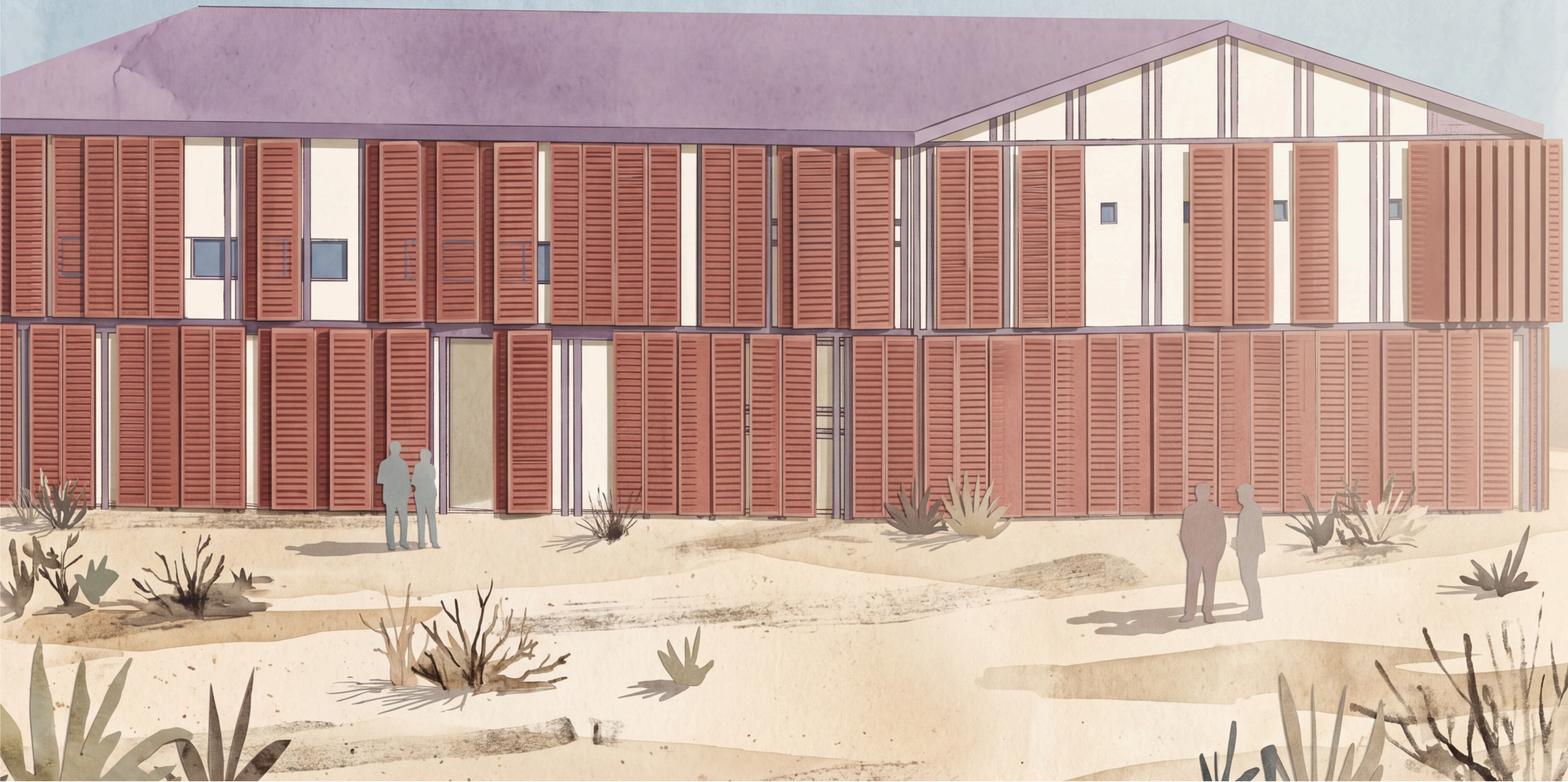
CRISIS ARCHITECTURE - PLANNING FOR THE UNEXPECTED

architecture at zero competition 06/01/2026



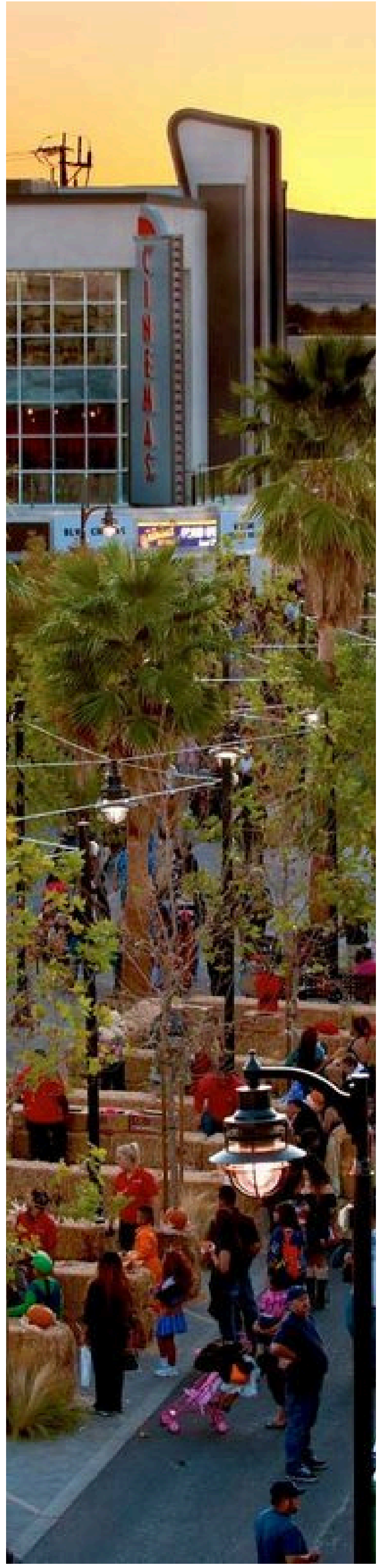
PROJECT NARRATIVE

La Plaza is conceived as a **culturally vibrant civic hub** that transforms seamlessly into a **community refuge during crises**. At its heart lies a generous central space — a flexible public “living room” where daily cultural life unfolds and where, in emergencies, the community can gather, coordinate, and find safety.

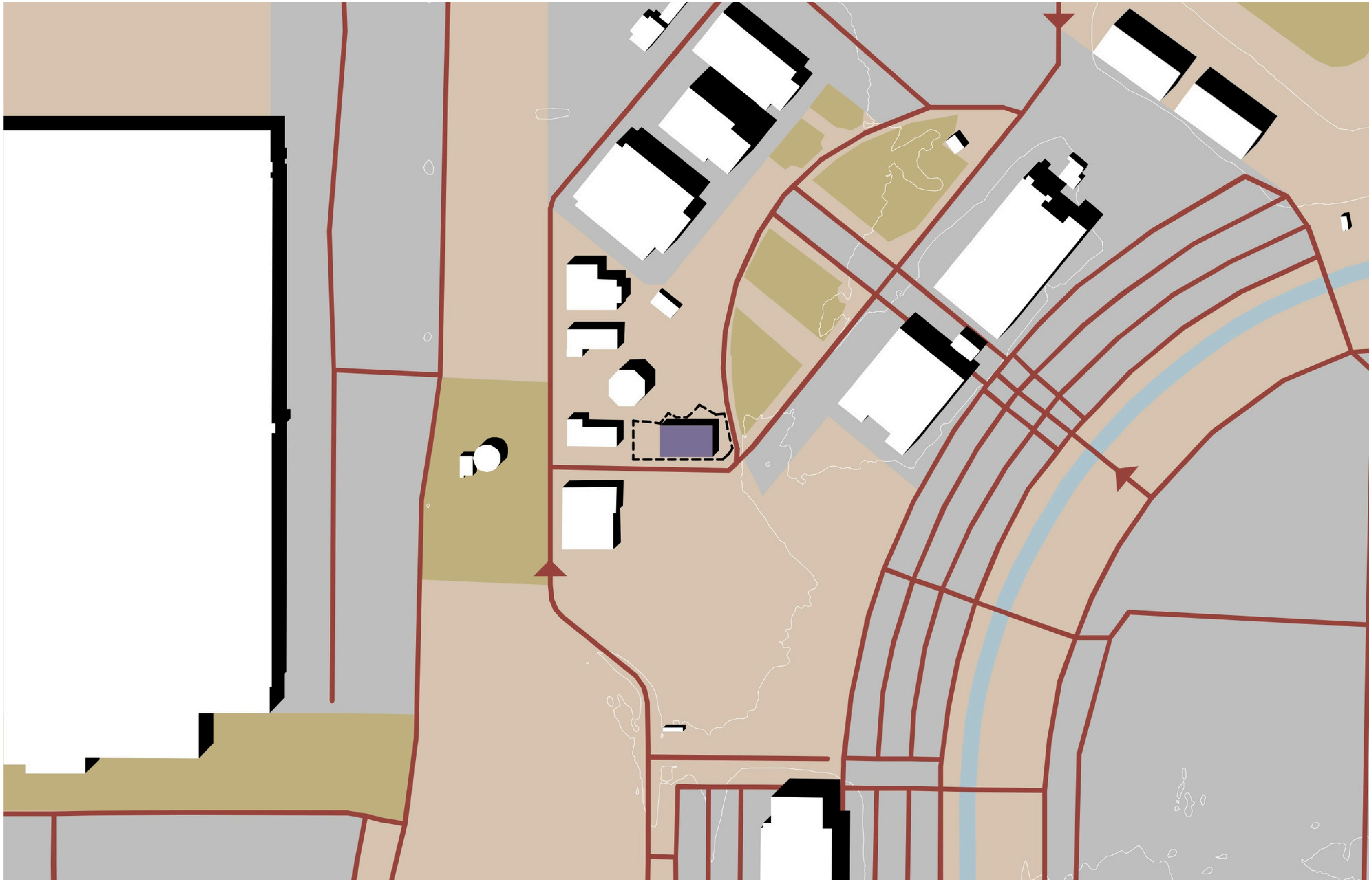
The extreme desert climate of Antelope Valley shapes the architecture. A **high-performance envelope**, exterior **movable shading system**, and **thermal-mass buffering** minimize heat gain and stabilize indoor temperatures, reducing reliance on mechanical cooling. Mixed-mode ventilation supports natural airflow during mild seasons, while a filtered closed-loop mode protects occupants during wildfire smoke events.

Fully electric VRF and DOAS systems, supported by **on-site solar generation** and **battery storage**, ensure low-carbon operation and maintain critical functions during outages. The building connects to a resilient microgrid capable of islanded operation, enabling uninterrupted use of communication rooms, cooling-refuge zones, and medical support spaces.

Landscape-integrated solar canopies, drought-tolerant planting, graywater reuse, and condensate recovery reduce water demand while creating shaded microclimates for outdoor gathering. These environmental systems work together to make La Plaza both **energy-efficient** and **climate-adaptive**, serving the community every day and sustaining it during regional disruptions.

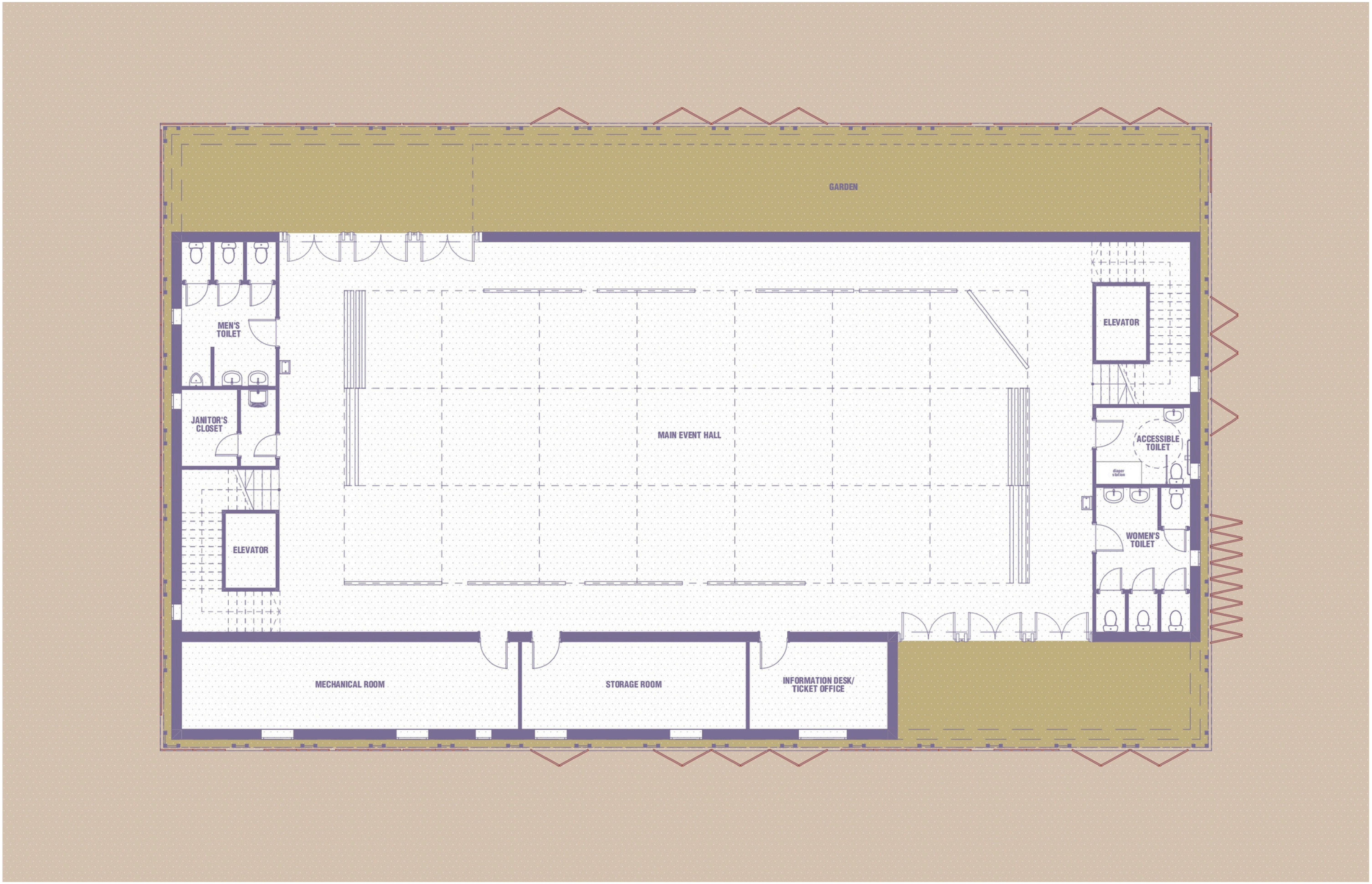


SITE PLAN



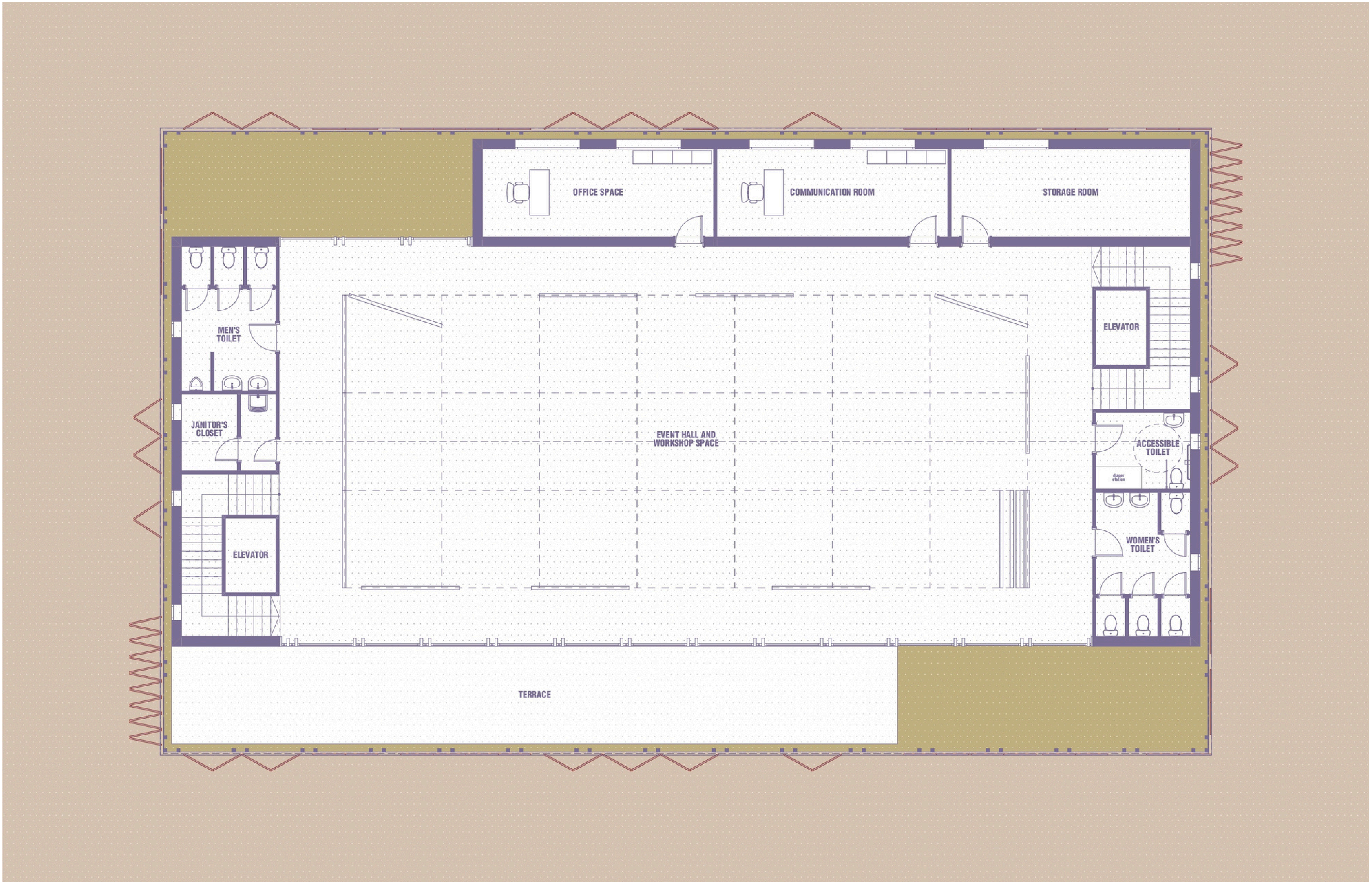
FLOOR PLANS - CULTURAL CENTER

ground floor **3A**



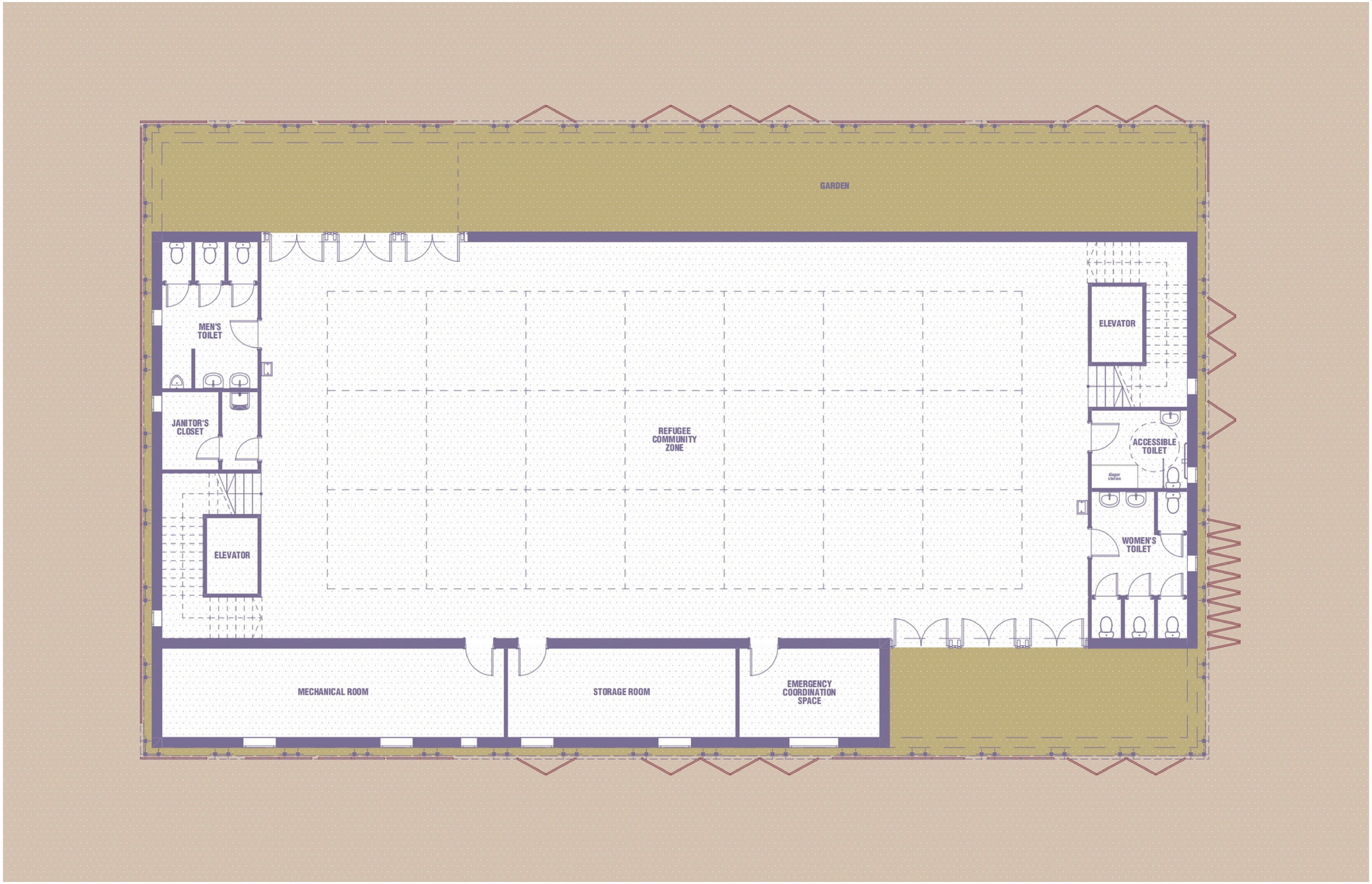
FLOOR PLANS - CULTURAL CENTER

1st floor **3A**



FLOOR PLANS - EMERGENCY OPERATIONS CENTER

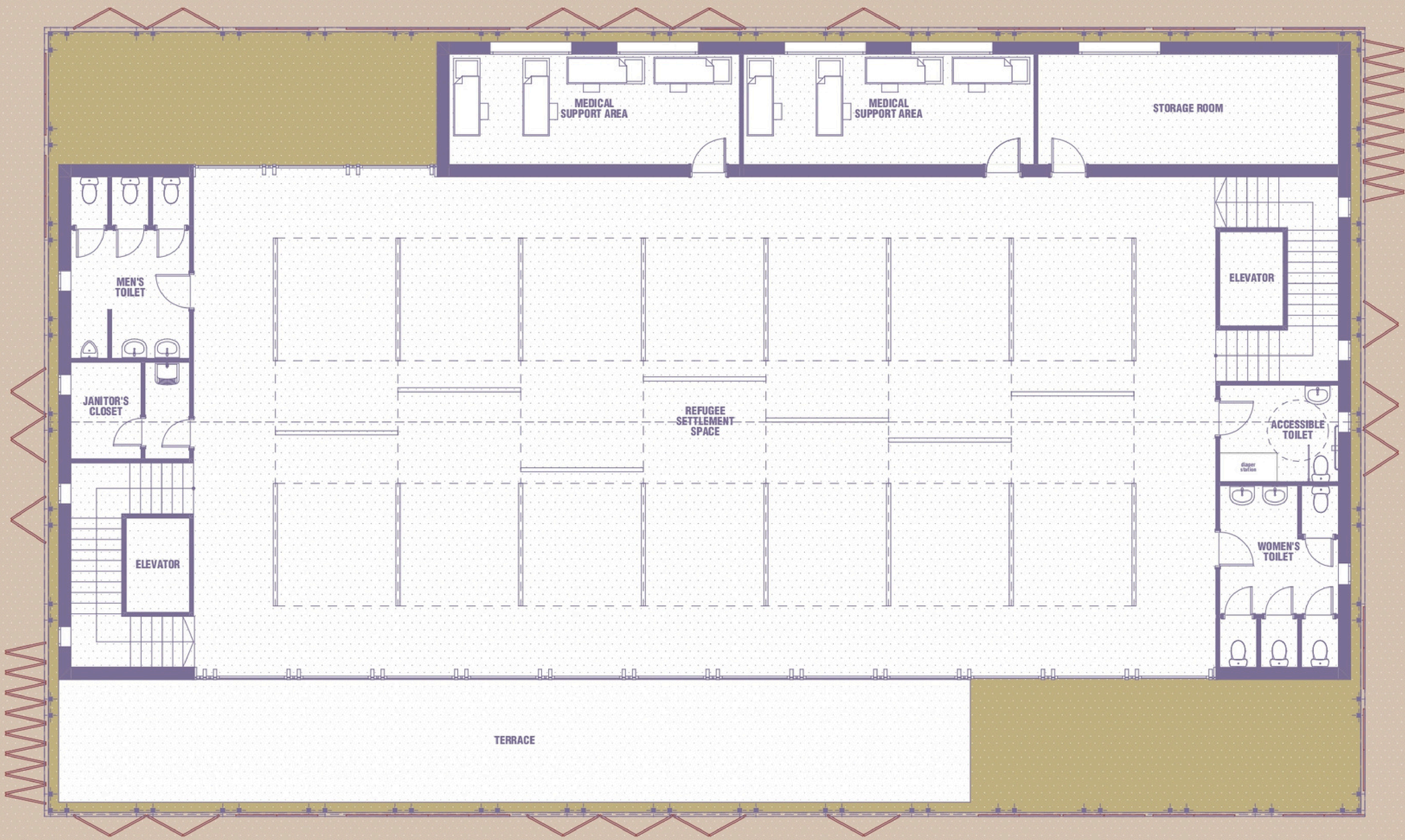
ground floor **3B**



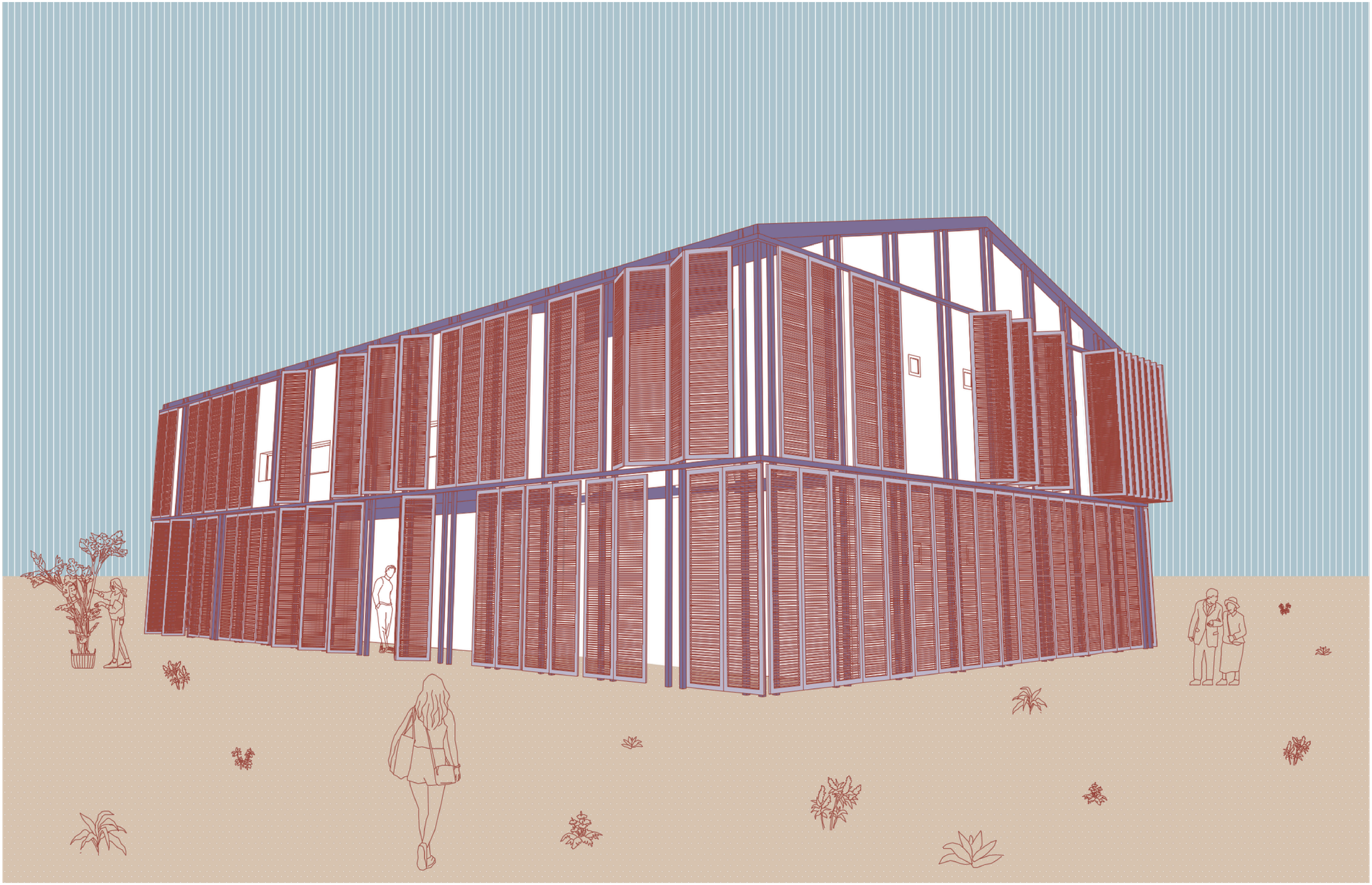
FLOOR PLANS - EMERGENCY OPERATIONS CENTER

1st floor

3B



PERSPECTIVE DRAWING



ILLUSTRATED SECTION

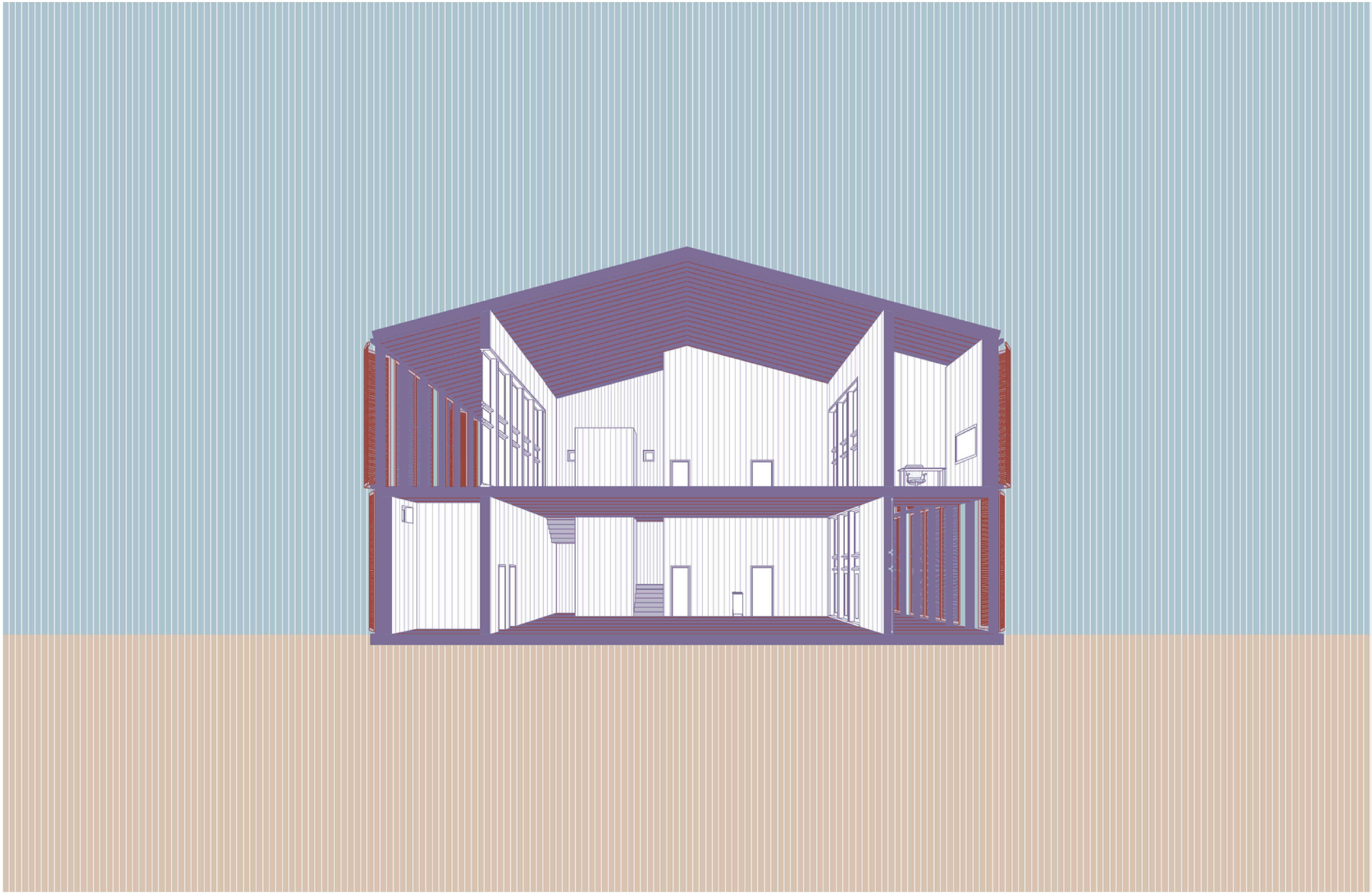
A-A

5A

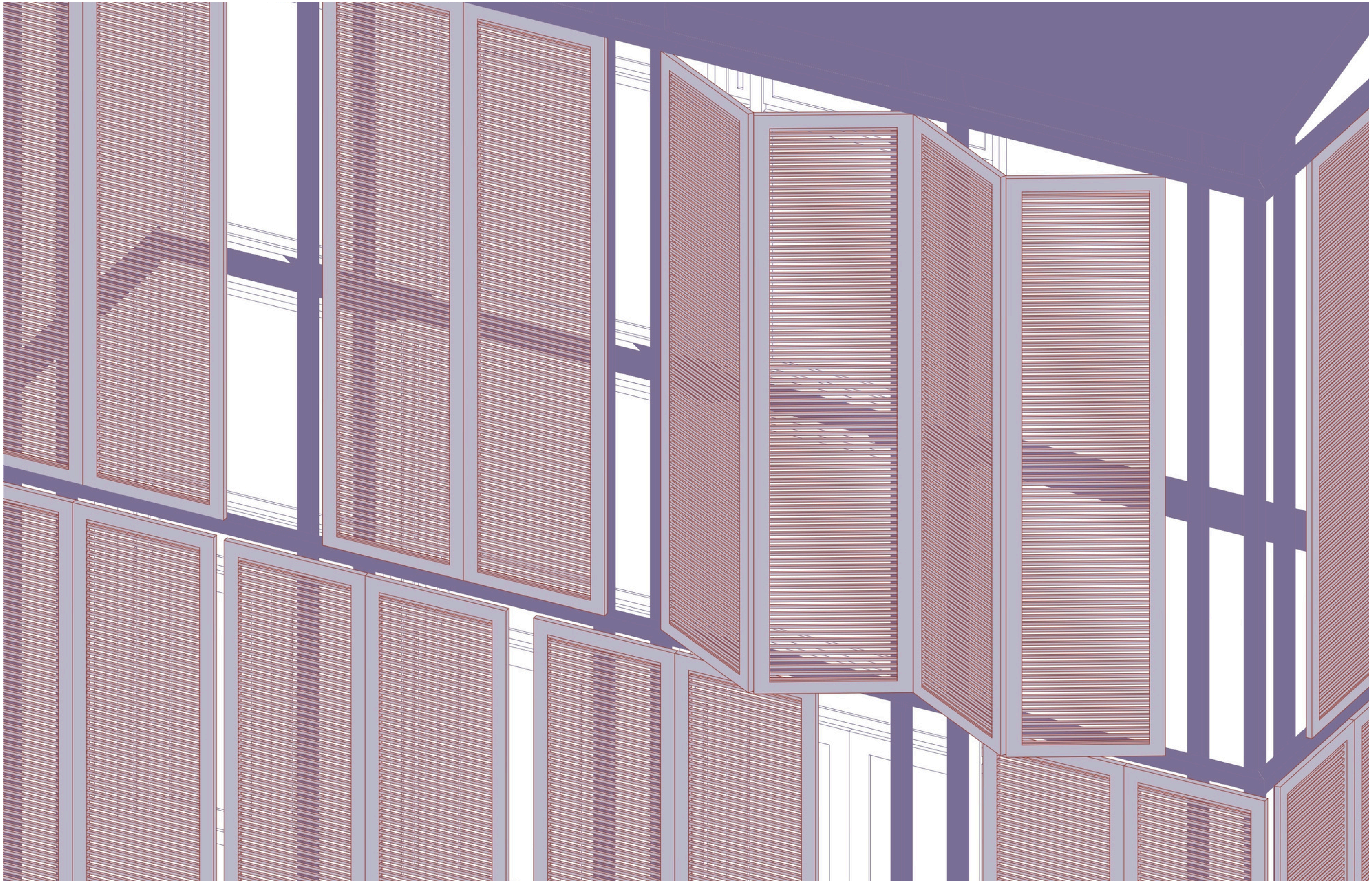
ILLUSTRATED SECTION

B-B

5B



SHADING SYSTEM



MECHANICAL SYSTEM SUMMARY

The mechanical strategy for La Plaza is designed as a resilient all-electric environmental system capable of supporting both daily cultural programming and emergency operations during regional crises. The design responds directly to the extreme desert climate of Antelope Valley, where high daytime temperatures, cold winter nights, strong winds, and prolonged power disruptions create significant operational challenges.

The project combines passive environmental control with high-efficiency active systems to reduce operational carbon while ensuring thermal survivability during emergencies. The building envelope minimizes heat gain through exterior shading, high-performance insulation, low solar heat gain glazing, and controlled daylight penetration. Thermal mass and night-flush ventilation strategies stabilize indoor temperatures and reduce peak cooling loads.

Conditioning is provided through a variable refrigerant flow (VRF) heat pump system paired with dedicated outdoor air systems (DOAS) incorporating energy recovery ventilation. This approach allows individual zones to operate independently during fluctuating occupancy conditions while maintaining high indoor air quality during wildfire smoke events and emergency occupation periods.

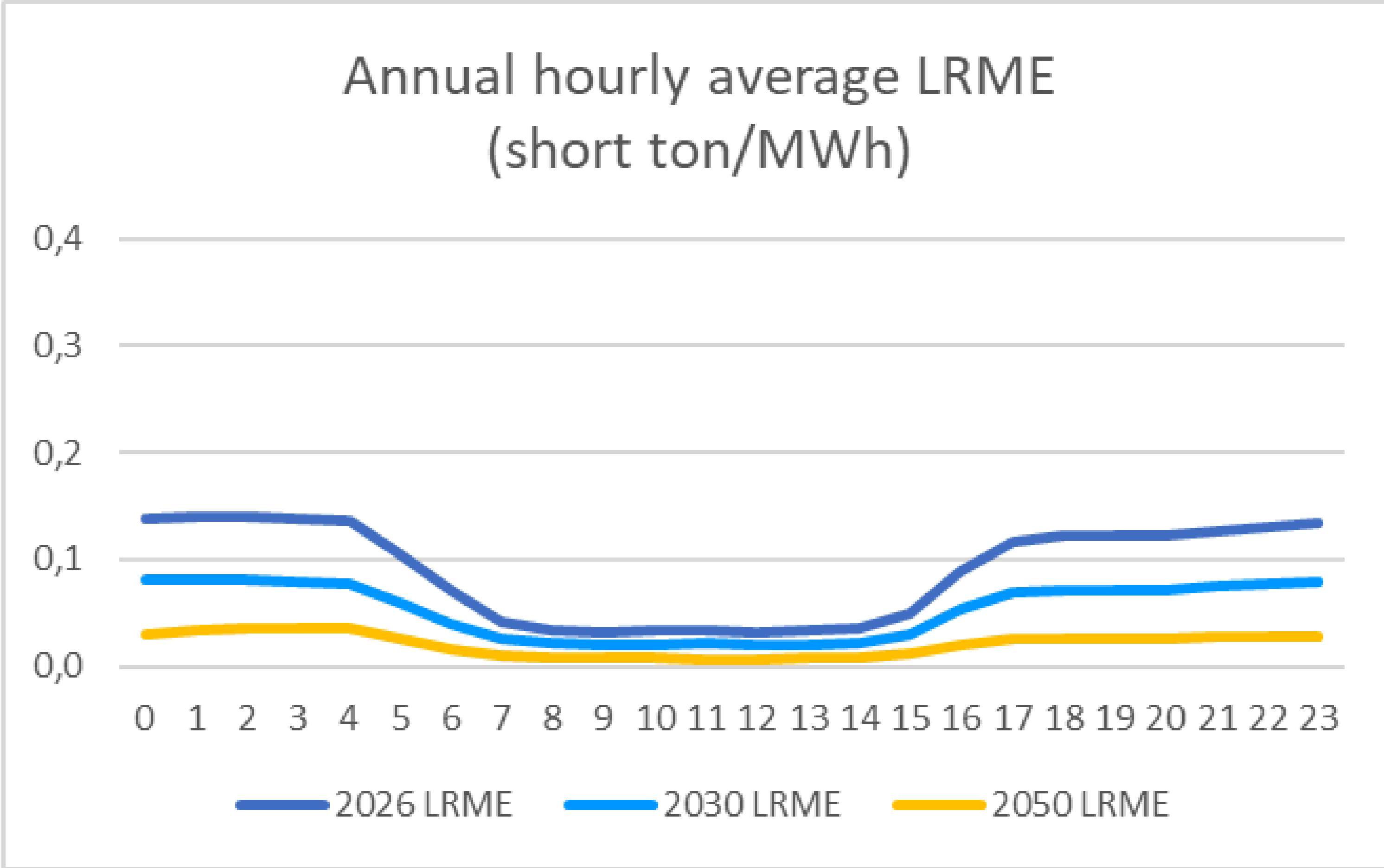
The building operates as a mixed-mode system during shoulder seasons, enabling natural cross ventilation through operable openings. During emergencies or poor air quality conditions, the building transitions into a filtered closed-loop operating mode to maintain occupant safety and operational continuity.

Mechanical systems are fully electrified and supported by on-site renewable energy generation (solar panels) and battery storage. Critical systems, including communications rooms, emergency coordination spaces, medical support areas, and cooling refuge zones, are connected to a resilient microgrid capable of islanded operation during utility outages.

Water-efficient systems reduce dependence on municipal infrastructure through low-flow fixtures, drought-adapted landscaping, condensate recovery, and graywater reuse strategies. Together, these systems create a low-carbon, adaptable, and climate-responsive building capable of serving the community during both everyday use and emergency conditions.

ANNUAL END USE SUMMARY

The annual energy strategy prioritizes reduction before generation. Through passive cooling, optimized orientation, high-performance envelope design, and efficient mechanical systems, the project substantially reduces operational demand prior to renewable energy offsetting.



Cooling remains the dominant annual energy use due to the desert climate and extended heat periods characteristic of Lancaster, California. However, peak cooling demand is reduced through shading systems, thermal buffering zones, natural ventilation strategies, and occupancy-responsive controls. Lighting loads are minimized through daylight harvesting and low-energy LED fixtures, while plug loads are managed through smart operational zoning and emergency-use prioritization.

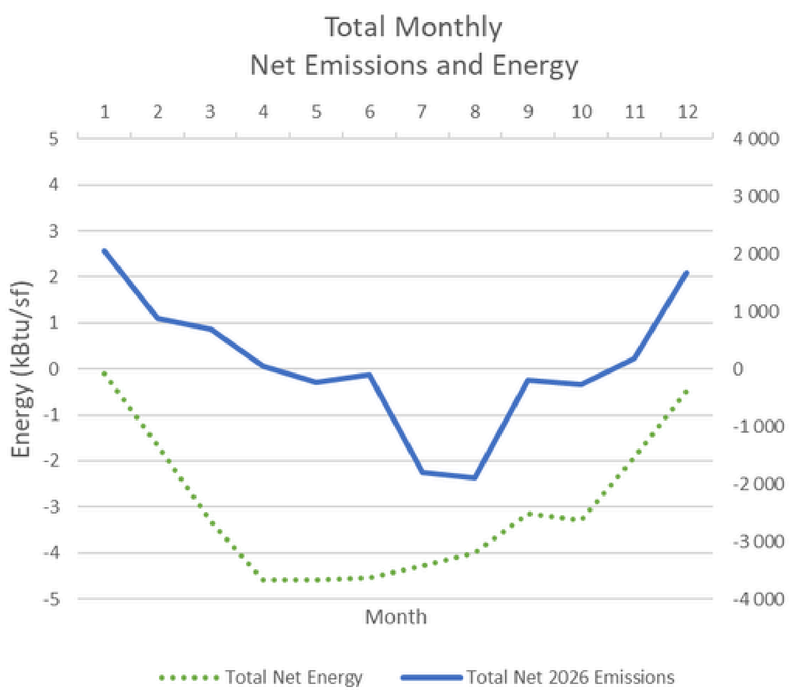
The building's all-electric operation eliminates on-site combustion emissions and supports California's long-term grid decarbonization goals. Renewable energy generation offsets the majority of annual building demand, enabling the project to approach net-zero operational carbon performance while remaining capable of emergency resilience operation.

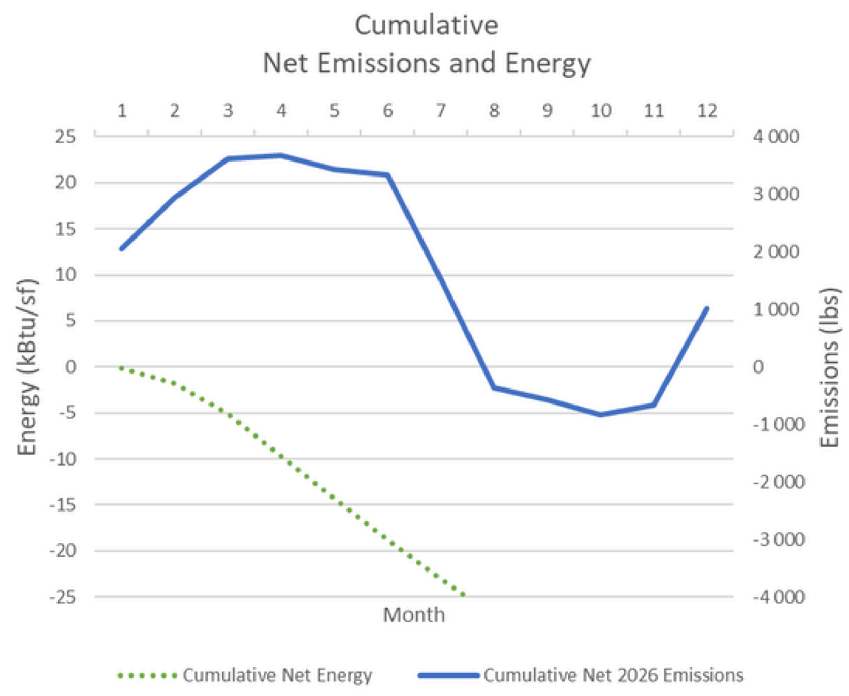
MONTHLY END USE ENERGY CONSUMPTION BAR CHART

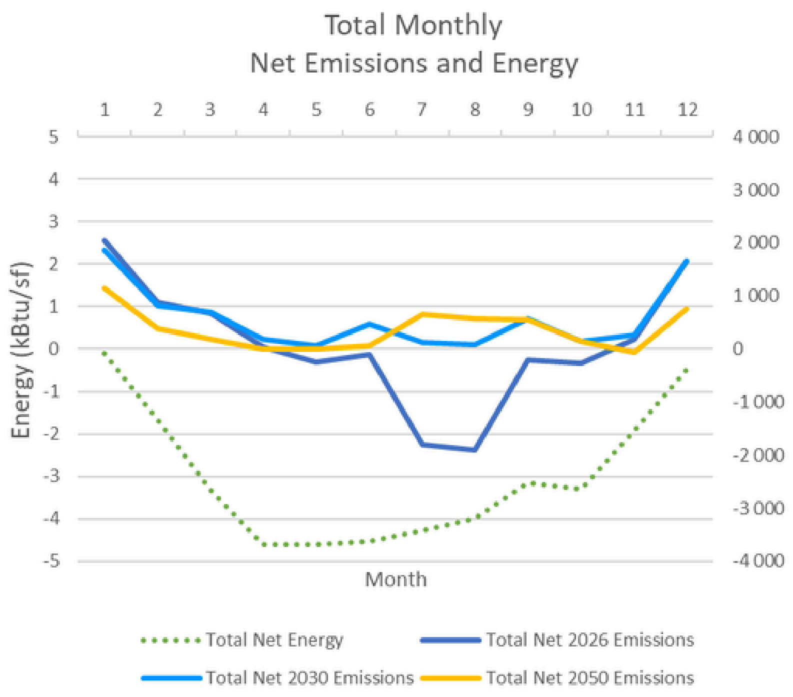
Monthly energy consumption reflects the strong seasonal relationship between climate conditions and cooling or heating demand. Summer months show elevated electrical use associated with cooling and ventilation requirements during extreme heat events, while winter demand remains comparatively low due to the mild desert climate and high-performance thermal envelope. Even though winter is relatively mild, due to the diurnal temperature variations, there is some heating demand which is fulfilled by electric heating systems and using the shading effectively to extract heat from the sun during the daytime.

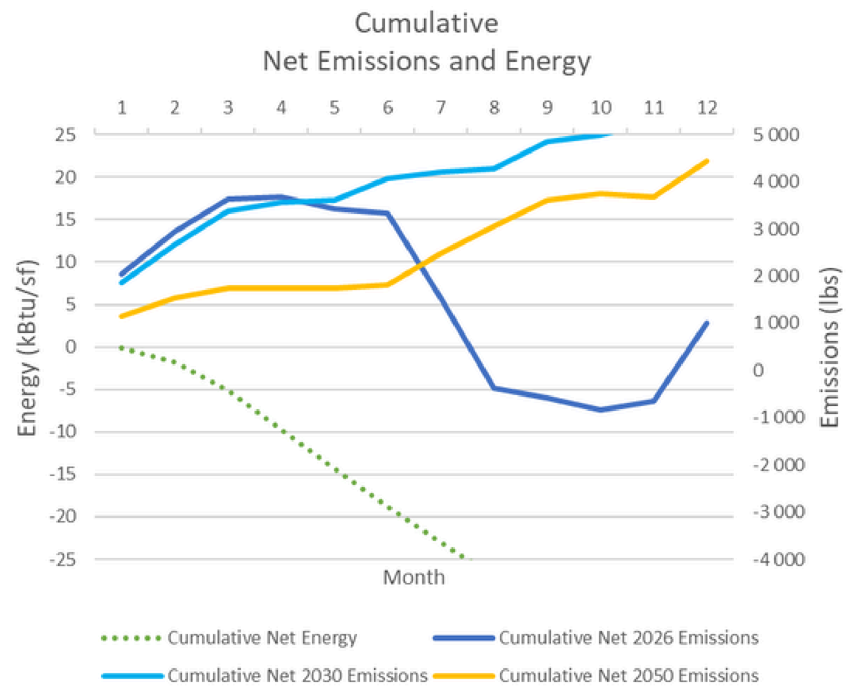
The project intentionally shifts portions of electrical demand away from late-afternoon peak utility periods through thermal storage effects, occupancy scheduling, adaptive setpoints, and battery-supported load management. During shoulder seasons, mixed-mode ventilation significantly reduces mechanical cooling requirements.

Seasonal fluctuations also reveal the effectiveness of passive design strategies. Exterior shading, evaporative landscape cooling, thermal mass, and reduced west-facing exposure decrease cooling intensity during the hottest months while maintaining occupant comfort.









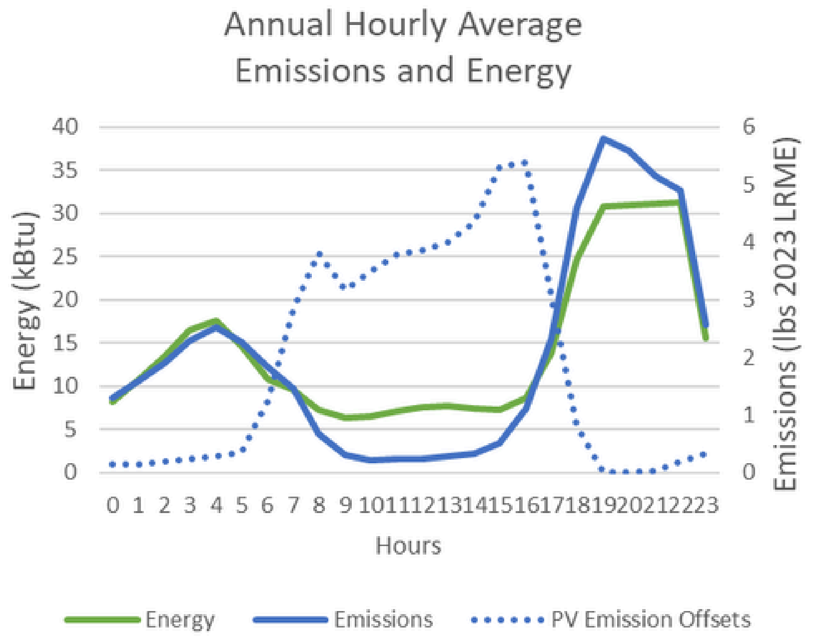
HOURLY LOAD SHAPES FOR ENERGY AND EMISSIONS

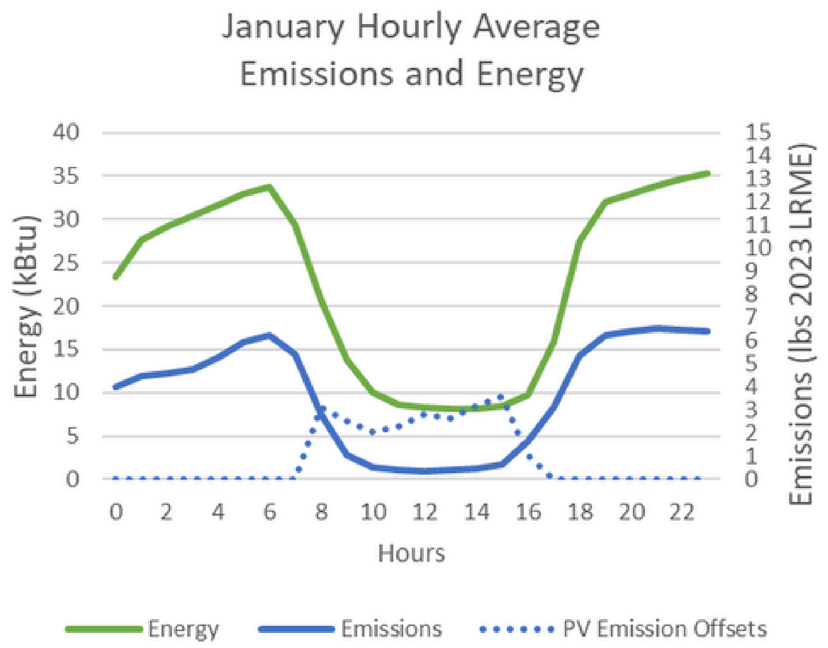
Hourly load analysis demonstrates the project's response to grid carbon intensity and peak demand periods. The building minimizes late-afternoon peak loads through passive cooling strategies, controlled daylighting, occupancy-responsive zoning, and battery-assisted load shifting.

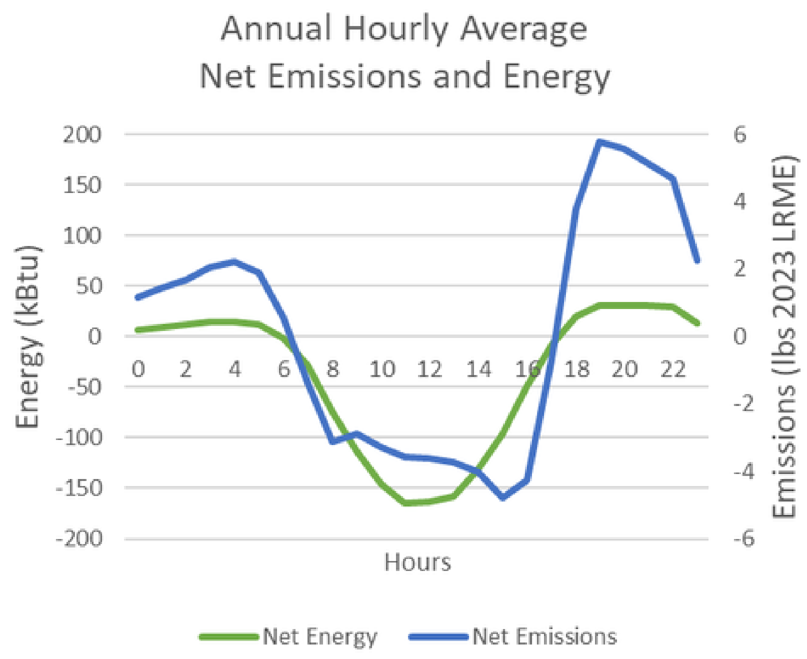
Renewable energy production aligns with daytime occupancy patterns, allowing solar generation to offset operational demand during periods of highest solar availability. Battery storage further reduces dependence on grid electricity during evening peak carbon periods and supports emergency operation during outages.

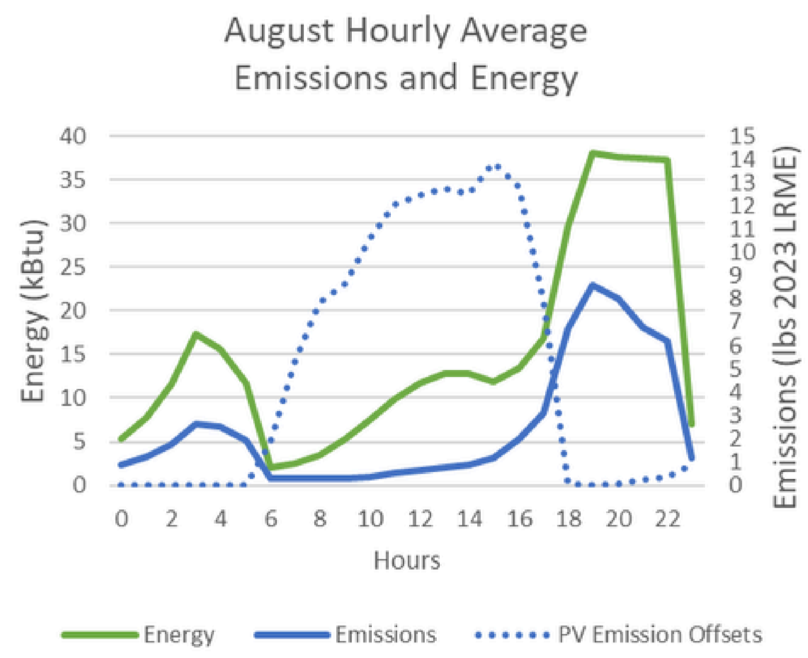
During emergency conditions, the building transitions into resilience mode, prioritizing critical systems such as communications infrastructure, emergency coordination spaces, medical support rooms, refuge cooling zones, and essential lighting. Noncritical systems are temporarily reduced to extend operational autonomy.

This adaptive load profile allows the building to function both as a low-carbon civic facility and as a resilient emergency operations center capable of supporting community needs during extended disruptions.









DETAILS OF RENEWABLE ENERGY SYSTEMS

Renewable energy generation is integrated directly into the architectural and infrastructural identity of the project. Roof-mounted photovoltaic arrays maximize southern solar exposure while simultaneously providing additional roof shading and thermal protection.

The renewable energy system is sized to offset the majority of annual electrical demand and is connected to an on-site microgrid supporting islanded operation during utility outages. Energy production is coordinated with battery storage systems to reduce dependence on the grid during periods of high carbon intensity and emergency conditions.

Given Lancaster's regional leadership in renewable energy and hydrogen innovation, the proposal also anticipates future integration with hydrogen-based storage and resilience infrastructure at the Antelope Valley Fair and Event Center. The building therefore operates not only as an isolated energy-efficient structure, but as part of a broader resilient energy ecosystem.

Landscape-integrated solar canopies provide shaded outdoor gathering spaces while generating electricity for community and emergency functions. Renewable infrastructure becomes visible and educational, reinforcing the project's role as a civic learning environment focused on climate resilience and decarbonization.

STORAGE SYSTEMS

Energy storage is fundamental to the project's resilience strategy. Battery systems allow the building to maintain critical operations during grid outages caused by wildfires, heat events, or seismic disruptions. Stored energy supports emergency communications, cooling refuge areas, medical support functions, ventilation systems, and operational coordination spaces.

The storage strategy also improves grid responsiveness by shifting electrical demand away from high-emission peak periods. Excess daytime solar production is stored and redistributed during evening operations, reducing dependence on carbon-intensive grid electricity.

Thermal storage principles are additionally embedded within the building envelope through exposed thermal mass, nighttime ventilation flushing, and passive cooling buffers. These systems reduce mechanical demand while extending survivability during prolonged outages.

Together, electrical and thermal storage systems transform the building from a conventional consumer of energy into an adaptive civic infrastructure capable of maintaining operation during unstable climate and utility conditions.

DECARBONIZATION STRATEGIES

The project addresses both operational and embodied carbon through an integrated architectural approach emphasizing efficiency, electrification, material reduction, and renewable energy generation.

Operational carbon is reduced through passive solar control, high-performance insulation, efficient glazing, mixed-mode ventilation, demand-responsive systems, and fully electric mechanical infrastructure. Renewable energy generation and battery storage further reduce reliance on fossil-fuel-based grid electricity while supporting resilient operation.

Embodied carbon reduction strategies include the use of low-carbon structural systems, regionally sourced materials, modular construction methods, and minimized finish applications. Material selection prioritizes durability, repairability, and long service life to reduce future replacement impacts.

Landscape strategies also contribute to decarbonization by mitigating urban heat island effects, reducing irrigation demand, supporting biodiversity, and creating shaded microclimates that improve outdoor thermal comfort.

Rather than treating sustainability as an isolated technical layer, the project integrates decarbonization directly into spatial organization, environmental performance, and community resilience.

CLIMATE ADAPTATION ASSESSMENT MATRIX

The project responds to the primary climate risks facing Antelope Valley through a layered resilience framework integrating passive survivability, environmental buffering, operational redundancy, and community support infrastructure.

Extreme heat adaptation strategies include shaded outdoor circulation, high-performance envelope systems, thermal mass, passive cooling, cooling refuge zones, and drought-adapted landscape systems. Wildfire smoke resilience is supported through filtered ventilation modes and compartmentalized indoor air management systems.

Water scarcity adaptation includes graywater reuse, condensate recovery, drought-tolerant planting, and reduced potable water demand. Wind mitigation strategies shape landscape buffers and protected outdoor gathering spaces to improve comfort and safety during high desert wind events.

Emergency preparedness is reinforced through battery-backed microgrid infrastructure, resilient communication systems, flexible interior programming, and dual-use operational planning. The building is capable of transitioning rapidly from civic cultural use into emergency coordination mode while maintaining essential functions during infrastructure disruptions.

The resulting adaptation framework positions La Plaza as both a cultural destination and a long-term climate resilience asset for the Antelope Valley community.

EQUITY ESSAY

Our design process approached equity not as a separate requirement, but as a fundamental architectural framework shaping how the building serves the community during both everyday use and emergency conditions.

Research into Antelope Valley revealed overlapping environmental and social vulnerabilities, including extreme heat, water scarcity, air quality concerns, and unequal access to cooling, shelter, transportation, and public resources. These challenges disproportionately affect vulnerable populations including children, older adults, outdoor workers, unhoused individuals, and historically marginalized communities.

In response, La Plaza was designed as an inclusive civic “living room” that supports cultural identity, environmental comfort, and community resilience simultaneously. Flexible public gathering spaces accommodate cultural events, educational programs, performances, and multigenerational activities throughout the year while remaining capable of rapid transformation into emergency coordination and refuge spaces during disasters.

The project prioritizes thermal comfort, shaded outdoor environments, universal accessibility, clean indoor air, and reliable access to energy and communication systems during outages. Landscape and water systems create cooler microclimates and welcoming public areas that remain usable despite extreme desert conditions.

Rather than designing a building that only performs during emergencies, the proposal creates a resilient public infrastructure that strengthens community life every day. Equity, in this project, means ensuring that safety, comfort, cultural representation, and environmental resilience are accessible to all members of the community regardless of age, income, or circumstance.