resiliency

Wellness Through Design

NOURISHMENT + AIR + **LIGHT** + FITNESS + COMFORT

Ankrom Moisan

{ PHYSICAL INFRASTRUCTURE }

{ OPERATIONS }

{ MARKET NEEDS }

We design for wellness by finding opportunities to adapt while maintaining physical infrastructure, operations, and marketing. Wellness relies on constant attention with periodic adaptations, so we've divided our insights into two operational tracks: Normal and Adaptive.

LIGHT

The numerous health benefits of access to natural daylight are undeniable. Science has shown that natural light makes us sharper and happier during the day, provides us with better sleep at night, and helps us recover faster when we get sick.

Bringing daylight indoors in a thoughtful way requires a delicate balance of interdependent variables. Simply adding more windows to a building is not a fix-all solution. To properly daylight indoor spaces, designers must balance glazing, climate, solar and thermal gain, external views, nighttime darkness, and many other factors. This document provides an overview of some of these considerations around light (and adjacent systems) when thinking about designing senior living communities.

1	DAYLIGHT
2	GLARE, COLOR, AND UNIFORMITY
3	SOLAR
4	POWER: OUTAGES, GENERATION, AND STORAGE
5	ALARMS AND SENSORS
6	DAS

1

DAYLIGHT

Access to natural light is critical to the health and well-being of both residents and staff. Common areas, living areas, and staff work areas should all have ample access to natural light.

DAYLIGHT

Large windows and skylights are only part of an effective daylighting system. Light level sensors, occupancy sensors, and other hardware are also important. This additional equipment can greatly increase the effectiveness and cost savings of lighting control systems by turning off or dimming lights where not needed.

Common areas benefit the most from light level sensors and timers, while resident units are best served by occupancy sensors.

Lighting control systems can be set to maximize daylighting efficiency.

Staff should be trained on when and how to override the system, and on how to set it back.

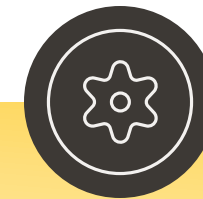Unlike the constant light from artificial sources, daylight changes continuously throughout the day. Connection to the natural day/night cycle has been shown to have significant health benefits, especially in older adults.

NORMAL OPERATIONS

Health

Better zoned systems

Balanced light

{ MARKET NEEDS }

{ PHYSICAL INFRASTRUCTURE }

{ OPERATIONS }

ADAPTED OPERATIONS

Supplemental lighting

Emergency efficiency

Well laid out windows, with an eye to daylighting in an emergency, can reduce the load on emergency systems. Windows into corridors, stairwells, and other emergency exit paths can provide lighting that would otherwise need to be provided by a generator or batteries.

Spaces that use daylight as a primary source of lighting will require less supplemental emergency lighting in an emergency.

Operationally, daylighting in an emergency response reduces the number of issues that staff has to manage.

2

GLARE, COLOR, AND UNIFORMITY

Reducing glare, ensuring the proper color for the right settings, and applying consistent light levels all work together to create a safe, and calming environment.

GLARE, COLOR, AND UNIFORMITY

Seniors are more sensitive to glare. Glare can be reduced with window shades, light shields and selection of finishes that are not overly reflective.

Adequate lighting levels, uniformity, and less glare create a safer environment than poorly lit homes, reducing the risk of falls.

Provide uniform lighting through careful selection and placement of indirect and shielded direct lighting.

Circadian lighting can improve sleep, reduce agitation and depression.

Provide circadian lighting systems that mimic natural light colors.

Staff should be trained on automated lighting and shade control systems.
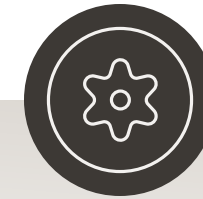
NORMAL OPERATIONS

Safety & health

Light control

Staff participation

{ MARKET NEEDS }

{ PHYSICAL INFRASTRUCTURE }

{ OPERATIONS }

3

SOLAR

Senior communities are uniquely ready for the benefits solar systems bring - the entire electrical load is shared, with no need to split metering across tenants. And on site power generation helps the community be more independent and sustainable.

SOLAR

Concern for the type of world that they are leaving for their families is a common sentiment for the incoming generation of seniors, solar power is one way to help make that world a little cleaner.

As the cost for solar continues to drop and the payback time reduces, solar power is moving from a luxury to a commodity.

Well-designed solar systems can offset costs for gas and electrical service.

A hidden benefit of many solar systems is that they provide additional shading for the roof, reducing the heat load on the building, and reducing energy costs.

During normal operations typical solar systems generate and store power on site or feed the power back into the grid to "run the meter backwards." Every utility handles these requirements differently, so local coordination is critical.
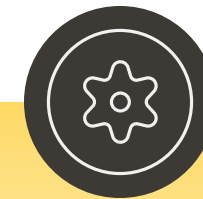
NORMAL OPERATIONS

Sustainability

Cost effective

On the grid

{ MARKET NEEDS }

{ PHYSICAL INFRASTRUCTURE }

{ OPERATIONS }

ADAPTED OPERATIONS

Recorded results

Staff should be able to respond to resident questions on how and when the solar system provides power.

Power monitoring is available to communicate to residents how much the solar system is offsetting utility bills.

System back up

Solar systems, which include battery back-up equipment, can help to supplement generators, and back up non-critical infrastructure* such as cell phone charging stations.

*   Confirm with local AHJ. Equipment to prevent back feeding into the municipal system may be required.

Emergency limitations

Use of solar in emergency situations may be restricted by the local utility to prevent back feeding into the grid.

4

POWER: OUTAGES, GENERATION, AND STORAGE

Broadly speaking, the code minimums for power outage coverage and generation do not fill the needs of a senior community - more sustained support across basic systems is required.

POWER: OUTAGES, GENERATION, AND STORAGE

ADAPTED OPERATIONS

{ MARKET NEEDS }

Unseen but critical

Generators and backed-up outlets are not flashy, but they are something that most seniors don't have in their single-family homes.

{ PHYSICAL INFRASTRUCTURE }

Sustained support

Building codes require a minimal amount of back-up power for egress lighting (90 minutes), but this may be insufficient for the needs of a senior living community, which often have a shelter-in-place approach. Emergency lighting should be evaluated for effectiveness in long term power outages and shelter-in-place residents.

Consideration should be given to backing up critical equipment, beyond what is required. Cooking equipment, communication hardware, elevators, and HVAC equipment provide critical functionality.
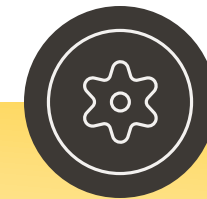
{ OPERATIONS }

Modern necessities

Another area where building codes have not caught up with technology is cell phone and other technology charging. Cellphones and internet connectivity have become critical for communication, and they are often disrupted by power outages. Charging stations on back-up power should be provided for staff and resident cell phones, and dedicated, backed-up outlets for critical battery powered equipment. Skilled nursing buildings should have back-up power available to visiting physicians for computer charging.

Staff should review equipment such as server rooms, and other critical equipment that's been added since the building's emergency power system was installed.
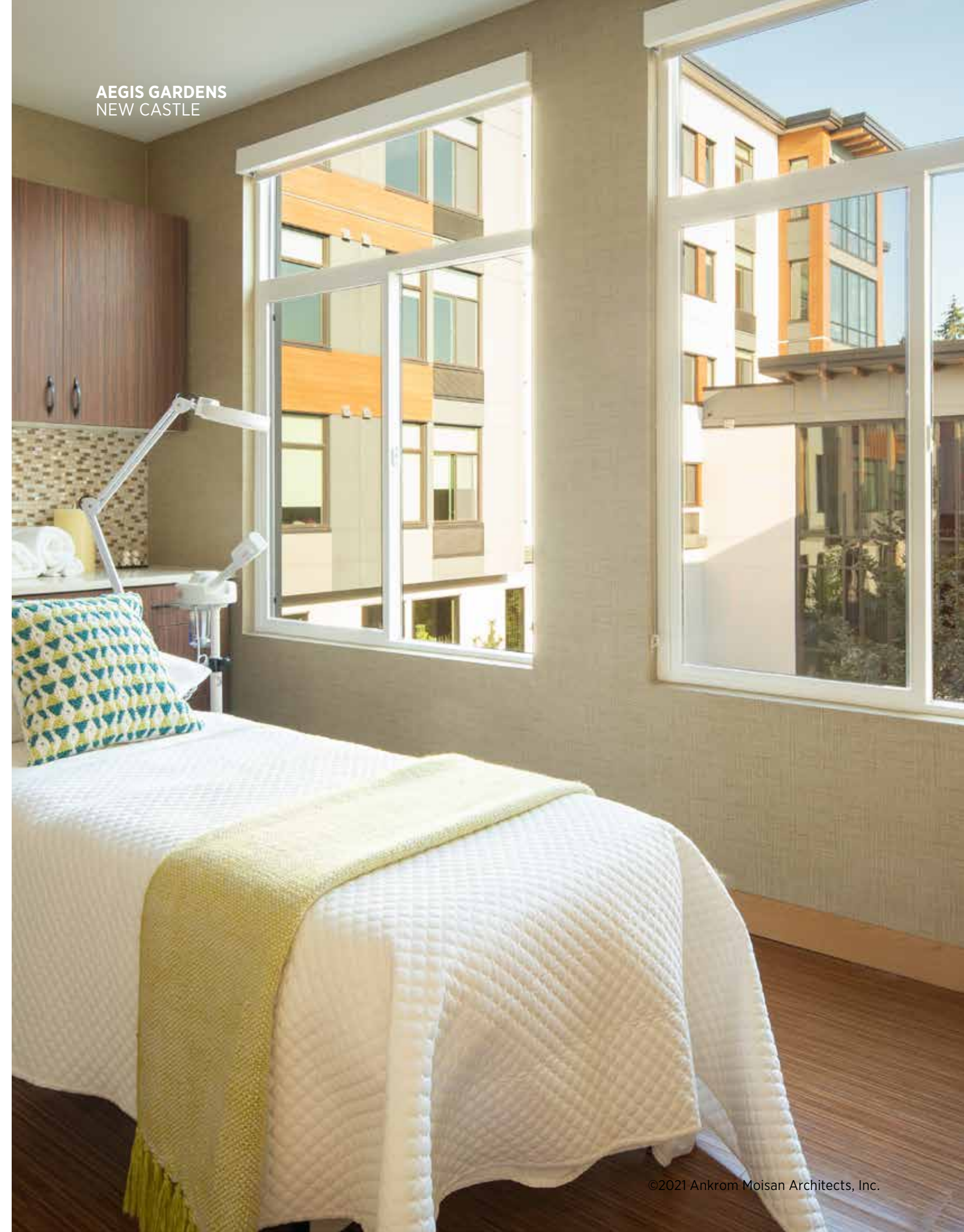
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ALARMS AND SENSORS

Well-maintained emergency alarm equipment can keep staff and residents aware and safe.

ALARMS AND SENSORS

NORMAL OPERATIONS

While fire alarm systems are almost always required by code, alarm systems for senior communities present some unique opportunities.

Strobe light alarms can be added for residents with hearing problems.

Alarms can notify (via an alarm company) the fire department.

CO alarms should be installed wherever there is a risk of CO build-up, such as enclosed garages. Codes generally require CO detectors in new builds but don't always require retro fitting existing ones.

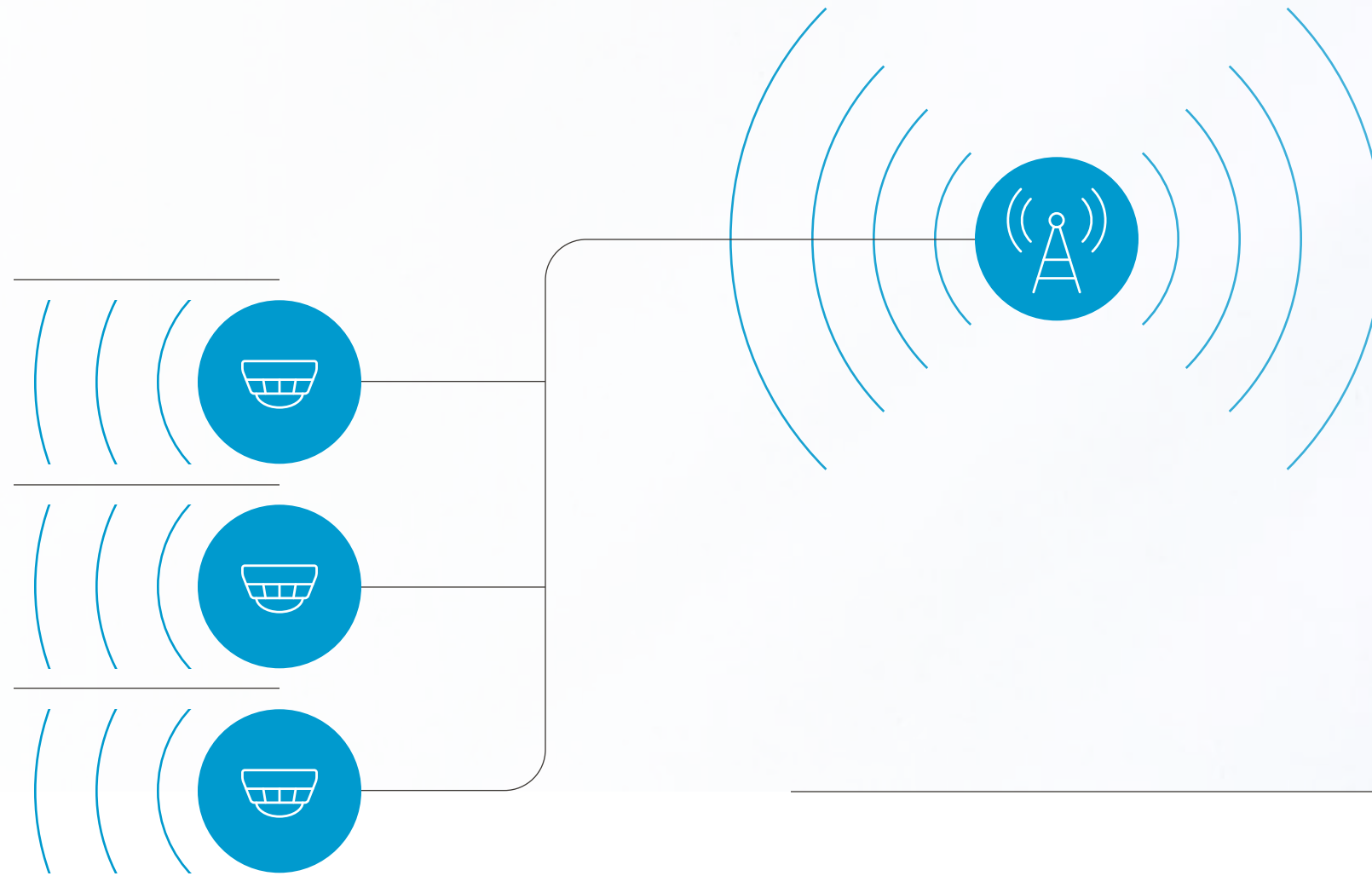Building management system alarms should be set to notify on critical equipment failure, such as sump pumps. They can also track maintenance tasks and send reminders so they're not missed.

Fire

Carbon monoxide

Building management

Many alarms systems have the capability to also broadcast verbal instructions. Critical for shelter-in-place fire responses.

Alarms can activate fire safety features throughout the building (and in some cases are required by code to) closing doors, turning on lights, and controlling mechanical equipment.

Many alarm systems can come with graphical interface so staff can quickly locate the source of the alarm.

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DAS

EMERGENCY RESPONDER

Distributed Antenna Systems (DAS) for emergency responder radios are required in most new buildings. These systems provide a signal boost to the emergency responder radio signal to avoid dead spots in radio coverage inside the buildings.

CELL PHONE

Distributed Antenna Systems (DAS) for cell phones provide signal boosting for cell phone coverage. They are not required by building codes and are carrier specific.

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