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### Project Program

<table>
<thead>
<tr>
<th>No.</th>
<th>Room</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>entry</td>
<td>61 SF</td>
</tr>
<tr>
<td>02</td>
<td>living</td>
<td>179 SF</td>
</tr>
<tr>
<td>03</td>
<td>dining</td>
<td>176 SF</td>
</tr>
<tr>
<td>04</td>
<td>kitchen</td>
<td>154 SF</td>
</tr>
<tr>
<td>05</td>
<td>hall</td>
<td>141 SF</td>
</tr>
<tr>
<td>06</td>
<td>bath</td>
<td>82  SF</td>
</tr>
<tr>
<td>07</td>
<td>bed</td>
<td>167 SF</td>
</tr>
<tr>
<td>08</td>
<td>mechanical</td>
<td>29  SF</td>
</tr>
</tbody>
</table>

### Integrated Systems

<table>
<thead>
<tr>
<th>No.</th>
<th>System</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Automated drip irrigation</td>
<td>maximizes water efficiency, ease of plant care</td>
</tr>
<tr>
<td>02</td>
<td>Master security system</td>
<td>centralized hub for smart lock control</td>
</tr>
<tr>
<td>03</td>
<td>Automated smart locks</td>
<td>added security, ease of nightly lock up</td>
</tr>
<tr>
<td>04</td>
<td>Learning thermostat</td>
<td>central location, adjusts to user patterns</td>
</tr>
<tr>
<td>05</td>
<td>Floor &amp; roof sensors</td>
<td>sense activity &amp; heart rate, Fall detection</td>
</tr>
<tr>
<td>06</td>
<td>Health monitoring systems</td>
<td>additional devices as required</td>
</tr>
<tr>
<td>07</td>
<td>Smart TV</td>
<td>displays collected data</td>
</tr>
<tr>
<td>08</td>
<td>Smart appliances</td>
<td>increased level of efficiency</td>
</tr>
<tr>
<td>09</td>
<td>Biometric sample analysis</td>
<td>health monitored by retrieval of samples</td>
</tr>
<tr>
<td>10</td>
<td>Sleep monitoring sensor</td>
<td>track respiration &amp; sleep cycle</td>
</tr>
</tbody>
</table>

= 964 SF
In the effort of sustainability, Team Las Vegas plans to use passive strategies in correlation with innovative mechanical systems. Passive strategies employed include attention to orientation and shading, separation of “shell” from “core” which for natural ventilation, operable overhangs which control direct solar exposure.
Energy analysis will be used as an iterative modeling tool throughout the project to evaluate designs and identify cost-optimal efficiency packages at various stages of the development. Detailed simulation-based analysis based on material characteristics, envelope design, electrical and mechanical systems and components selection, and target energy-savings level will be developed.
sd 2017
Concept 1
scale 1/4” = 1’0”

**plan Analysis**

**Advantages**
- Circulation route ideal for exhibition
- Open floor plan for social spaces
- Clear division between social/private
- Easy constructibility

**Disadvantages**
- Exceeds required square footage
- Bathroom not directly adjacent to bedroom
- Minimal daylight in bedroom
- Distance of hot water travel
“Wet” and “dry” mechanical systems are consolidated into centralized modules, reducing the energy requirements of distribution. The structural design will satisfy a mobile and modular approach, as well as maximize energy efficiency. The plumbing systems and mechanical systems will be low-maintenance, cost-effective and durable. It is the hope of Team Las Vegas that the successful application of these principles in a residence will serve as a model of sustainable living in the Mojave Desert.
plan B

Circulation

primary secondary tertiary
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Principles of aging-in-place design

The design of the interior environment and architecture consists of several principles in which evidence-based design research comes to fruition. Environments which integrate proper orientation for the user, behave autonomously in daily activities, provide intellectual and sensory stimulation, security, and balance private and social spaces are ideal for the aging individual. These principles create interior environments for true independent living and successful aging.

1 facilitation of orientation Priming the user with appropriate visibility through fenestrations of the building is a primary component to facilitate orientation.

2 autonomy The project allows for autonomy in spaces where mobility may be most difficult for an older person, such as the kitchen, bath, and living space.

3 providing a safe and secure environment The interior environment is nestled within a sequence of transparent and opaque partitions to create a comfortable enclosure for privacy and security. These partitions are rhythmic in material to allow for transparency and privacy in
4 balance between private and social spaces The home is divided into social and private modules. Both modules allow for generous outdoor exposure and semi-visibility to the adjacent spaces to retain way-finding abilities.

5 intellectual + sensory-stimulation The design provides spaces for multipurpose activities and consequently a sense of novelty and variety throughout the day. It is a high priority to create variety in multipurpose spaces, as it is a form of intellectual and sensory stimulation.
plan A

exhibition route
elevation
north/east

1/4" = 1'-0"
axon A
exterior
plan A
exhibition route
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elevation B
south/west

1/4" = 1'-0"1 south
1/4" = 1'-0"2 west

16.001

1/4" = 1'-0"1 north
1/4" = 1'-0"2 east

elevation
B
south/west
**Plan Analysis**

**Advantages**
- Open floor plan for social spaces
- Bathroom directly adjacent to bedroom
- Wandering route
- Double multi-function decks

**Disadvantages**
- South facade minimal glazing due to kitchen location
- Office space is non-private
- Distance of hot water travel
- Poor circulation from social to public
modules
configuration
Concept 3

**Advantages**
- Mechanical room best proximity
- Under required square footage
- Largest kitchen configuration
- Private office

**Disadvantages**
- Poor circulation between private and social
- Smaller social space
- Laundry inside of the private office
- Tight circulation in social spaces
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plan A
exhibition route
axon exterior
elevation B
south/west
modules configuration