

## DESIGN CONSIDERATIONS:

- 1) The basement walls of the home will be constructed of ICFs, providing strength and excellent insulation. The exterior wall and roof systems will be stick frame with spray foam insulation and vertical wood plank siding.
- 2) The roof will be metal, with rain gutters installed and plumbed to a cistern so rainwater can be used for domestic use and irrigation. A gray water system will be plumbed to augment irrigation.
- 3) There will be windows on the south side of the home to provide solar heating and good daylighting in the winter. An interior block wall between the dining room and family/game rooms will stabilize interior temperatures and provide nighttime warmth in the winter and prevent overheating in the summer. Windows on the north, west and east sides of the building will provide daylighting, ventilation and views.
- 4) A large solar water heating tank will provide domestic hot water and radiant heating, using an LPG boiler for back-up. Decorative wood stoves in the kitchen hallway area and dining room will be used for backup heating and a stone fireplace in the family room will add to the aesthetics and thermal mass. A stand-alone wood stove in the master bedroom will make it a cozy room in the winter.
- 5) A balcony and roof overhang on the east side of the home will provide shade during the morning hours. A screened porch on the west side will be shaded by the small ridge and aspen groove in the afternoon.
- 6) A loft opens to the family room's east wall, allowing additional ventilation and interaction between people in the two areas. An open slot above the game room will allow warm air to rise into and cool air to fall out of the upper level loft providing a heating effect in the winter and a cooling effect in the summer. A whole house fan above the loft will vent warm air in the summer.
- 7) A south deck with a solar heated hot tub will invite people out into the backyard to enjoy the beautiful scenery and close-by aspen grove. Upper balcony decks on the north and east will provide shady areas to enjoy the scenic views in the summertime.

## Mountain Aspen Passive Solar, Off-Grid Mountain Home

### Conceptual Drawings

<b>1st Floor:</b>	<b>1775sqft</b>
<b>2nd Floor:</b>	<b>1118 sqft</b>
<b>Basement:</b>	<b>663 sqft</b>

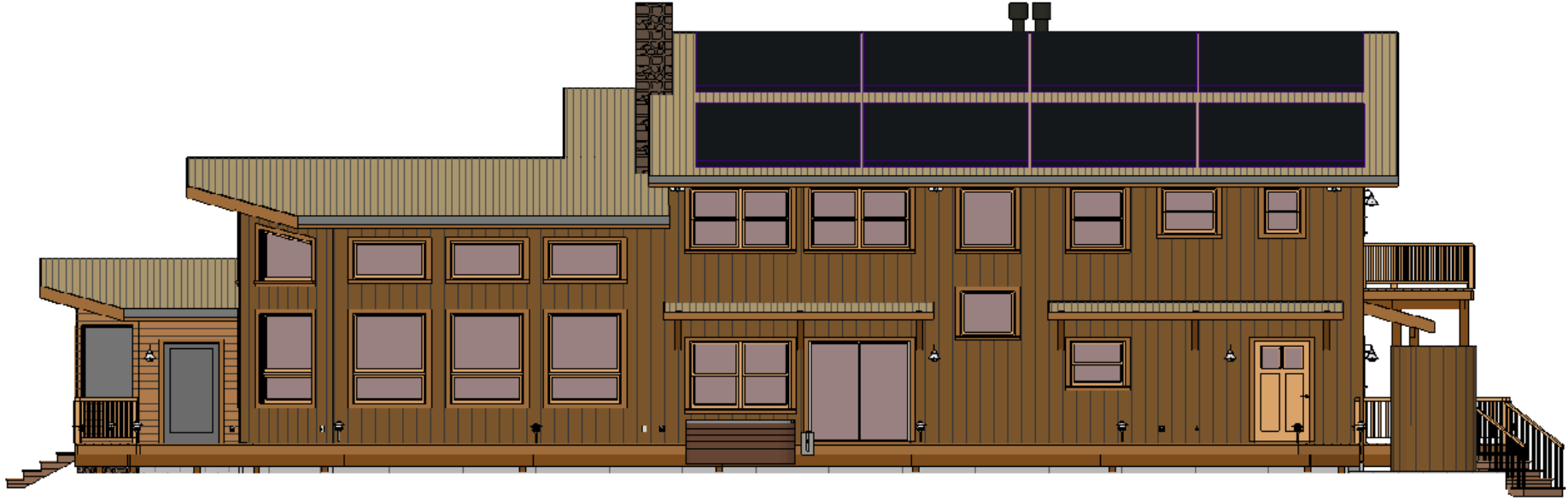
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<b>Total Conditioned:</b>	<b>3556 sqft</b>
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<b>Screen Porch:</b>	<b>222 sqft</b>
<b>Lower Decks:</b>	<b>1674 sqft</b>
<b>Balcony:</b>	<b>349 sqft</b>

<b>Garage:</b>	<b>896 sqft</b>
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**APPROX DESIGN TOTAL: 7000 sqft**



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*South Elevation*

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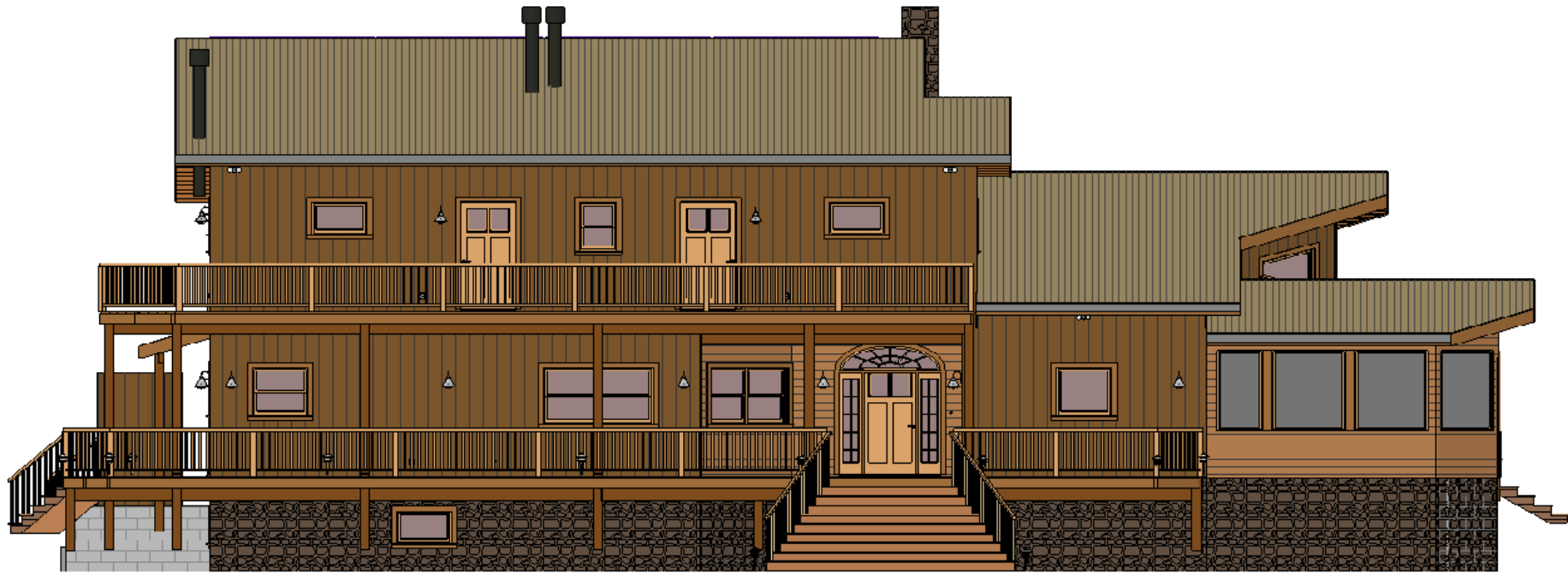
**Mountain Aspen Passive Solar, Off-grid Home**  
**Flagstaff, AZ**

Between Humphreys Peak and Kendrick Kendrick off Hwy 180, Flagstaff, AZ

**Project: 2008-05**

Designer: Thed Johnson  
Date: 3/14/09

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*North Elevation*

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**Project: 2008-05**

Designer: Thed Johnson  
Date: 3/14/09

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*East Elevation*

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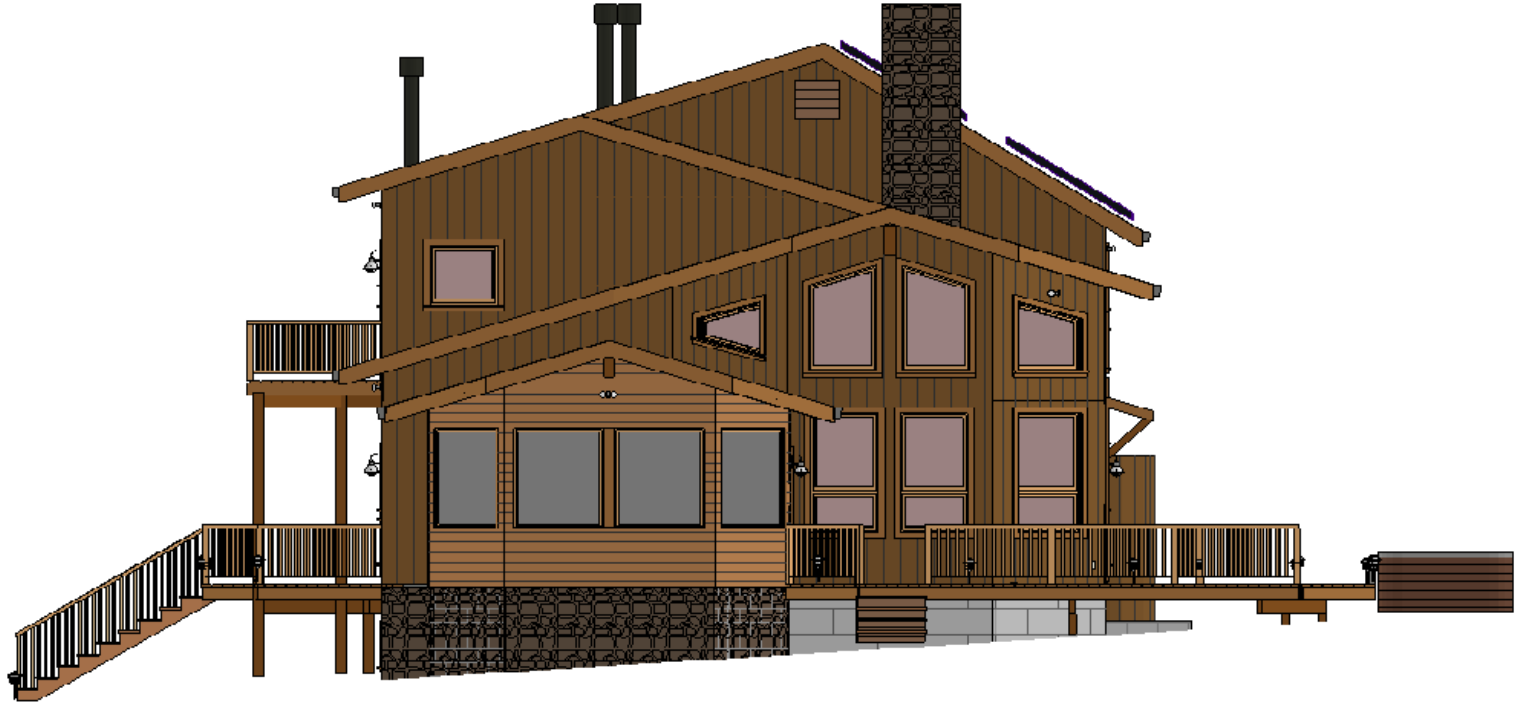
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Date: 3/14/09

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*West Elevation*

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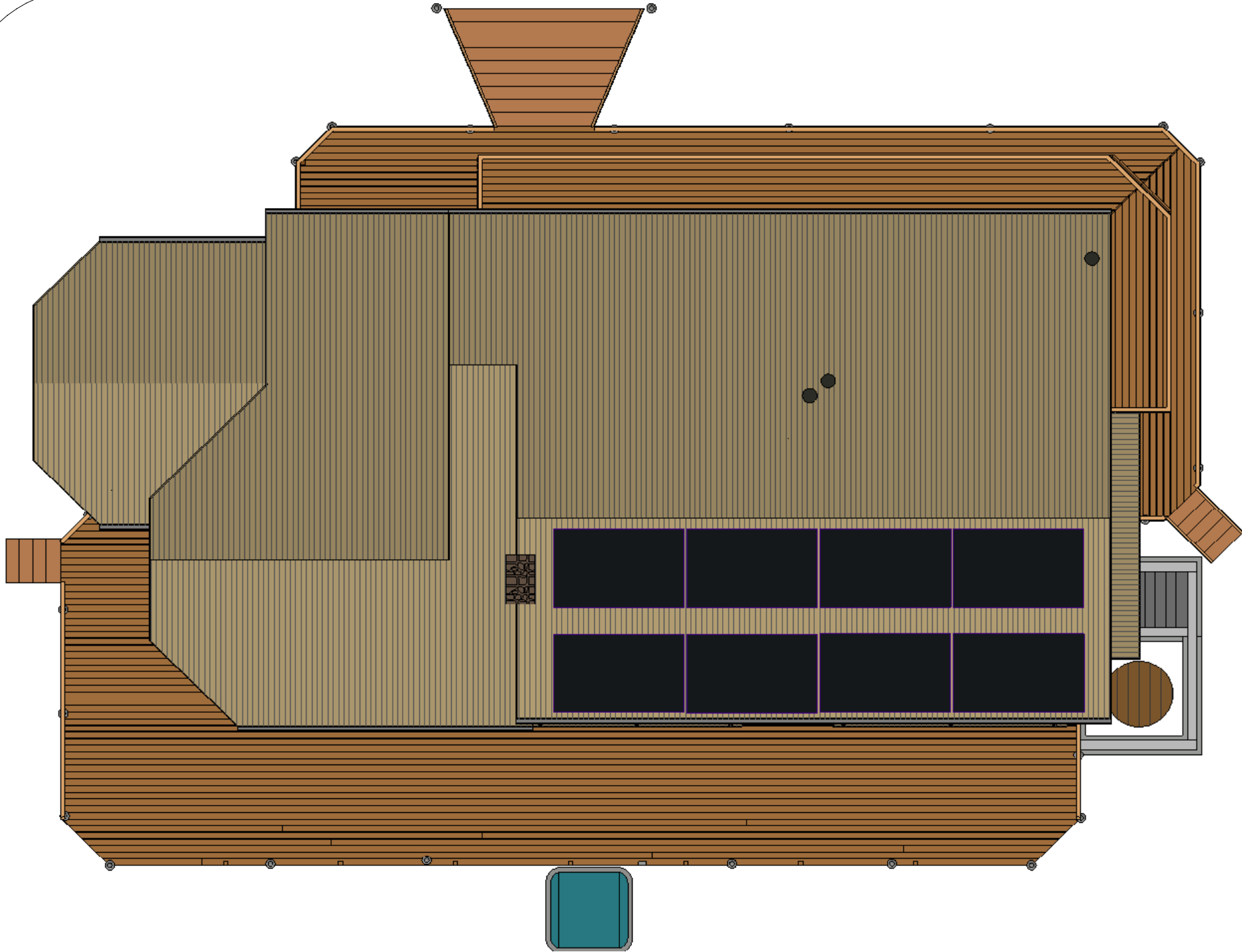
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**Project: 2008-05**

Designer: Thad Johnson  
Date: 3/14/09

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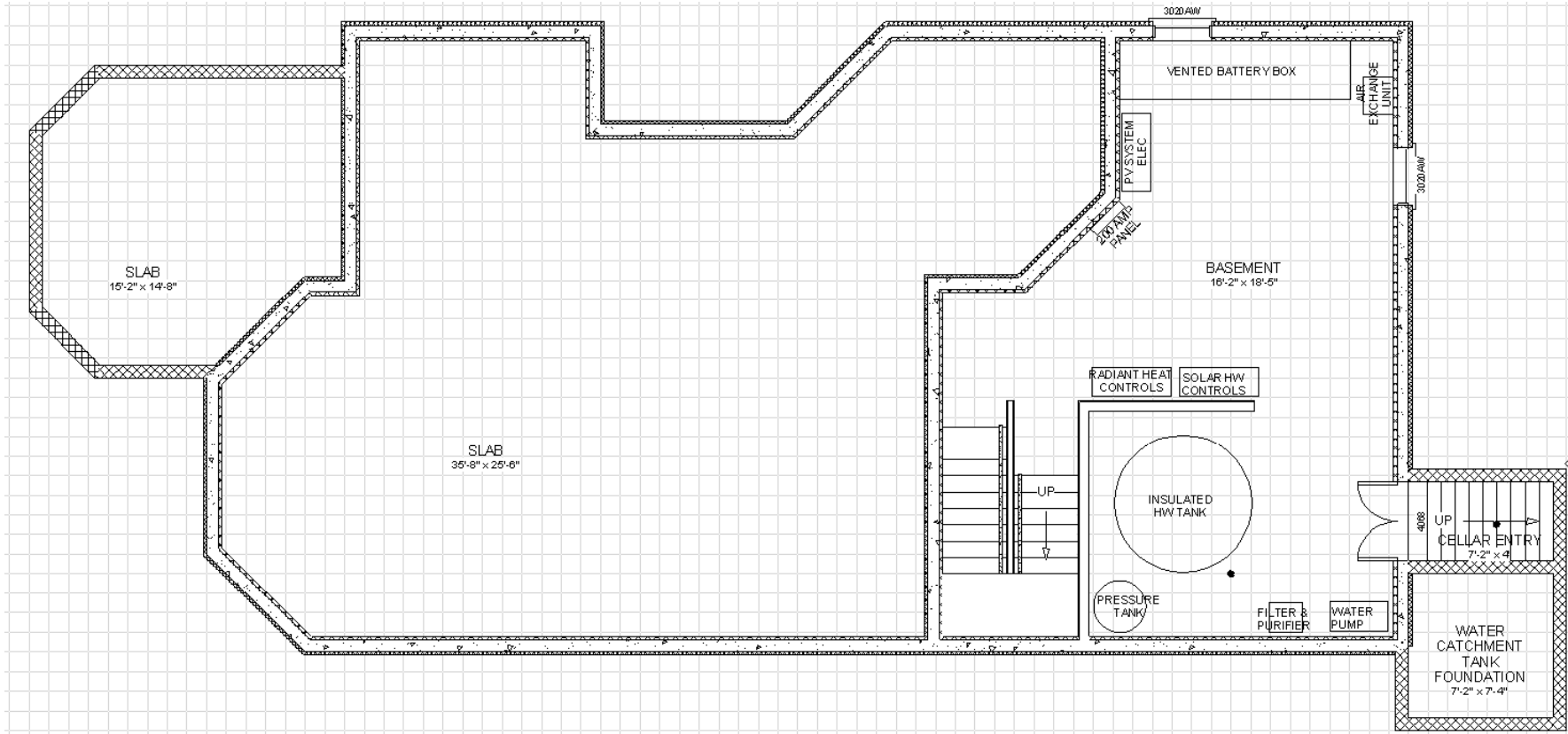


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**Flagstaff, AZ**  
*Between Humphrey's Peak and Kendrick Kendrick off Hwy 180, Flagstaff, AZ*

**Project: 2008-05**  
Designer: Thed Johnson  
Date: 3/14/09

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*Basement Floor Plan*

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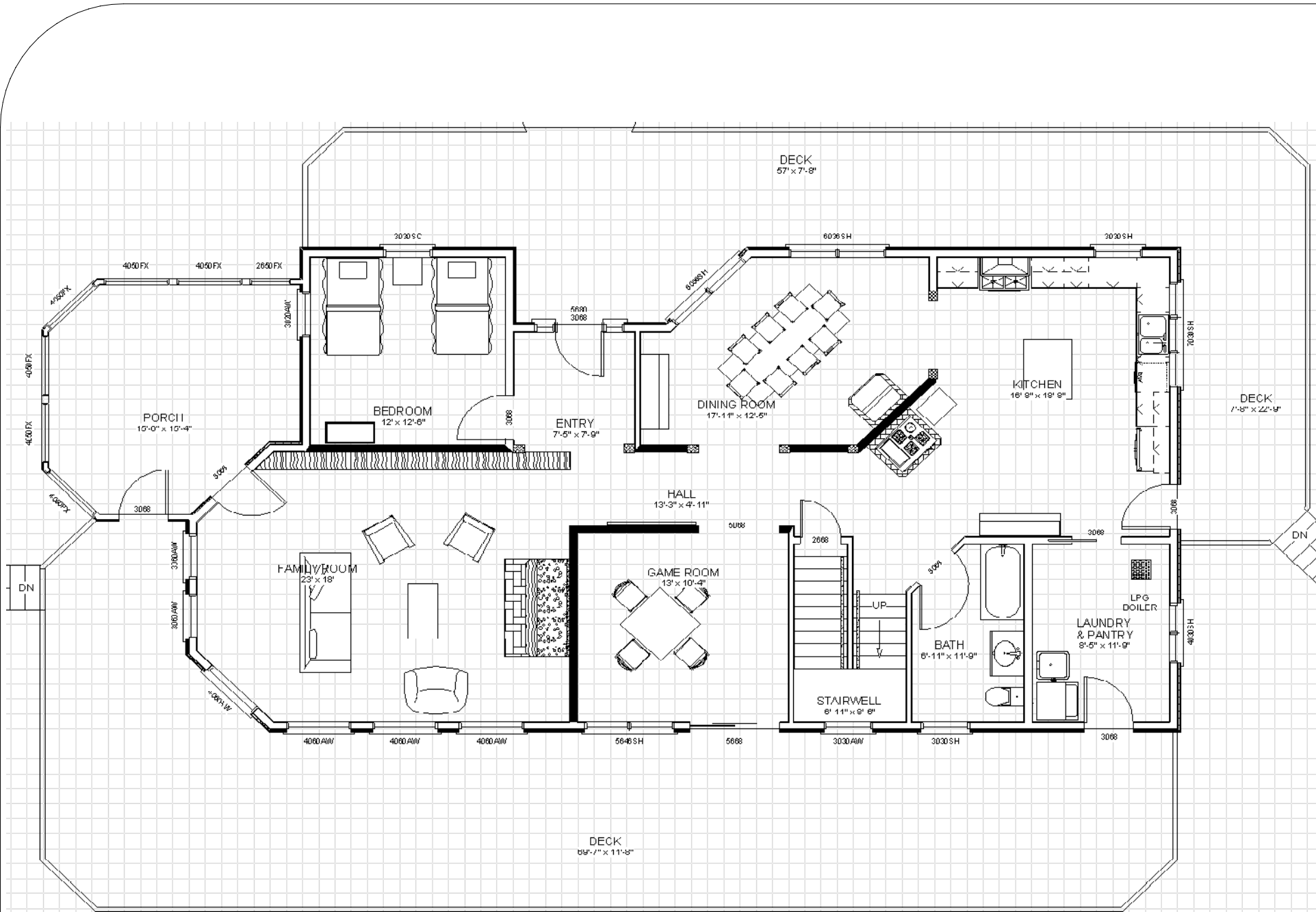
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**Flagstaff, AZ**  
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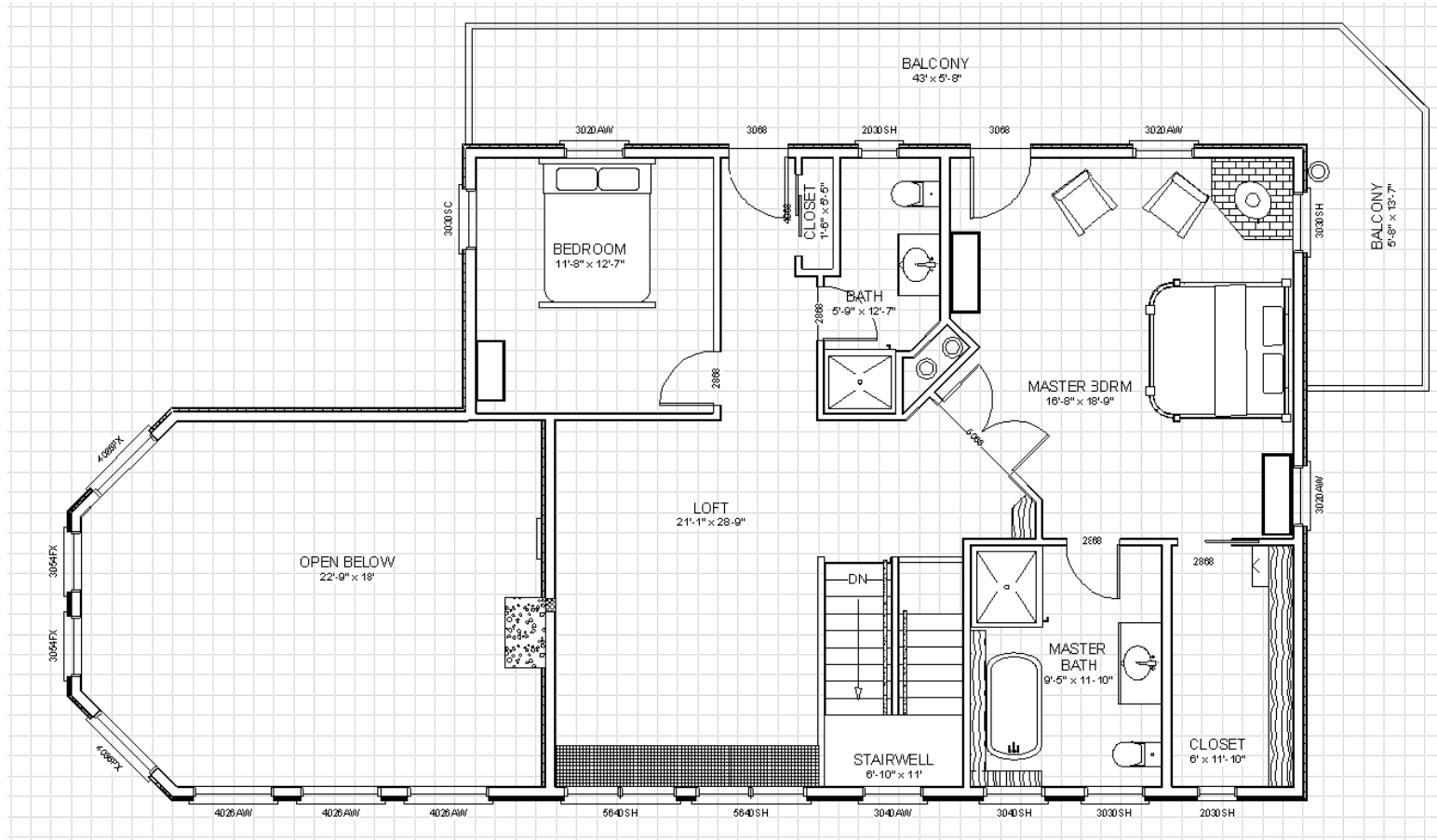
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*1st Level Floor Plan*

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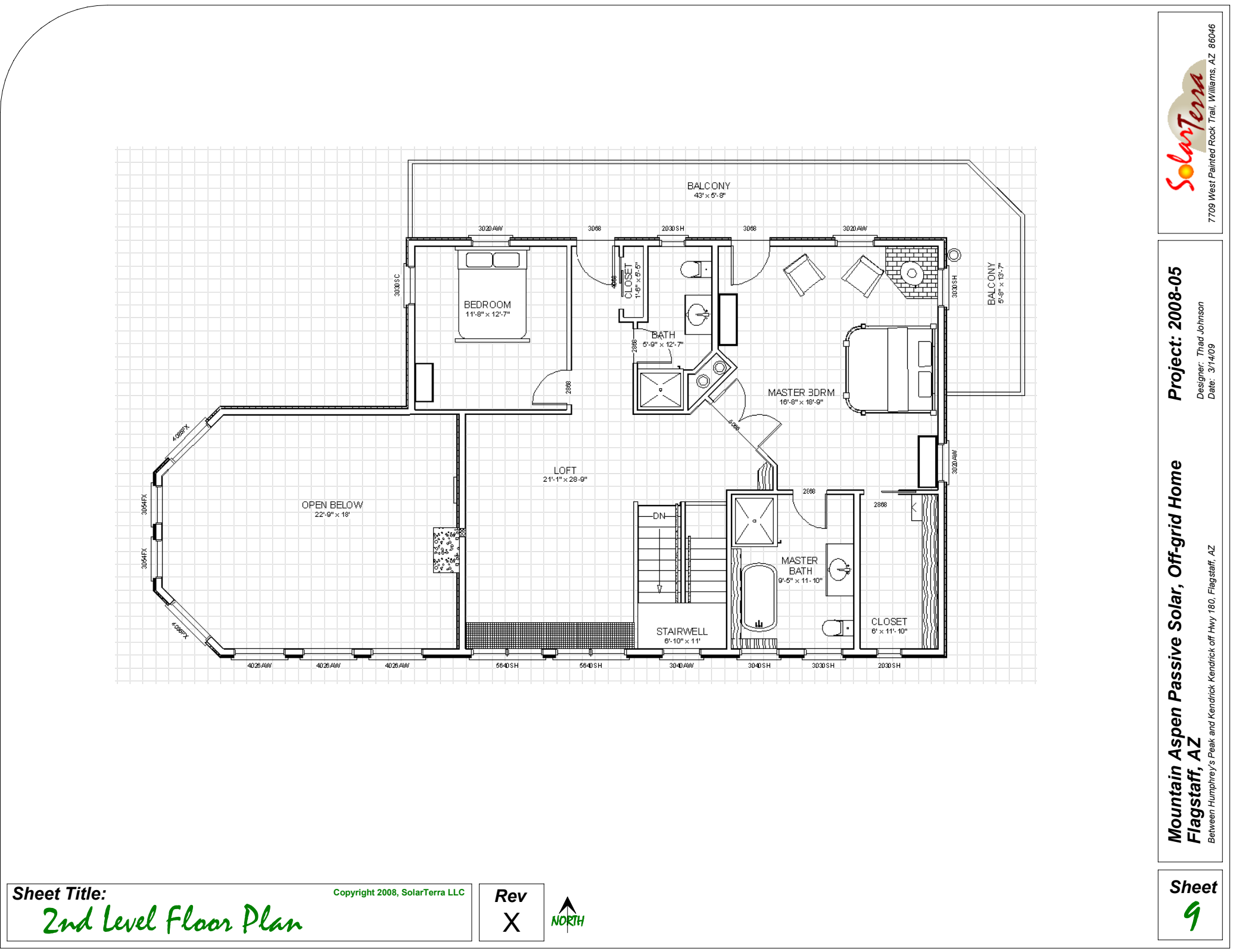


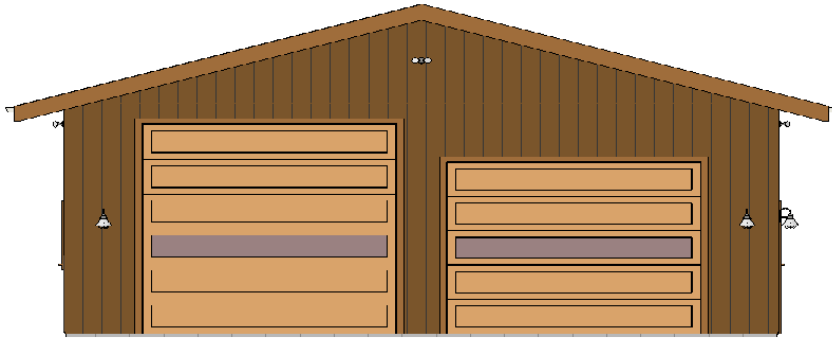
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2nd Level Floor Plan

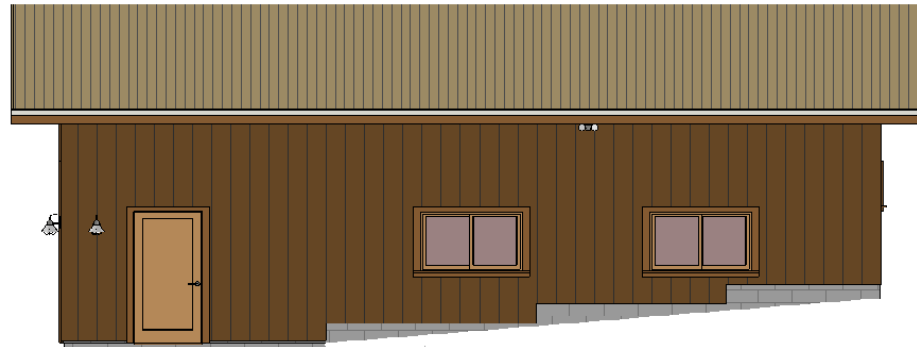
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NORTH



WEST

Sheet Title:

*Garage Elevations*

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Date: 3/14/09

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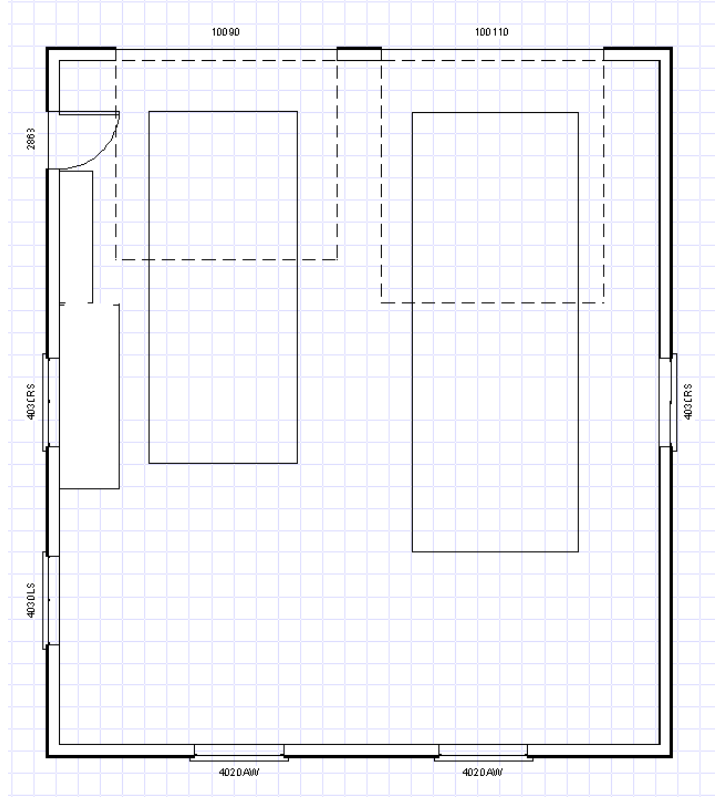
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Garage Floor Plan

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Date: 3/14/09



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**Winter Solstice  
Sun Angle Analysis**

Approx 31.5 degrees at 12pm  
Approx 13.3 degrees at 9am

SUN FOR  
SOLAR HW  
COLLECTORS

9AM  
12PM

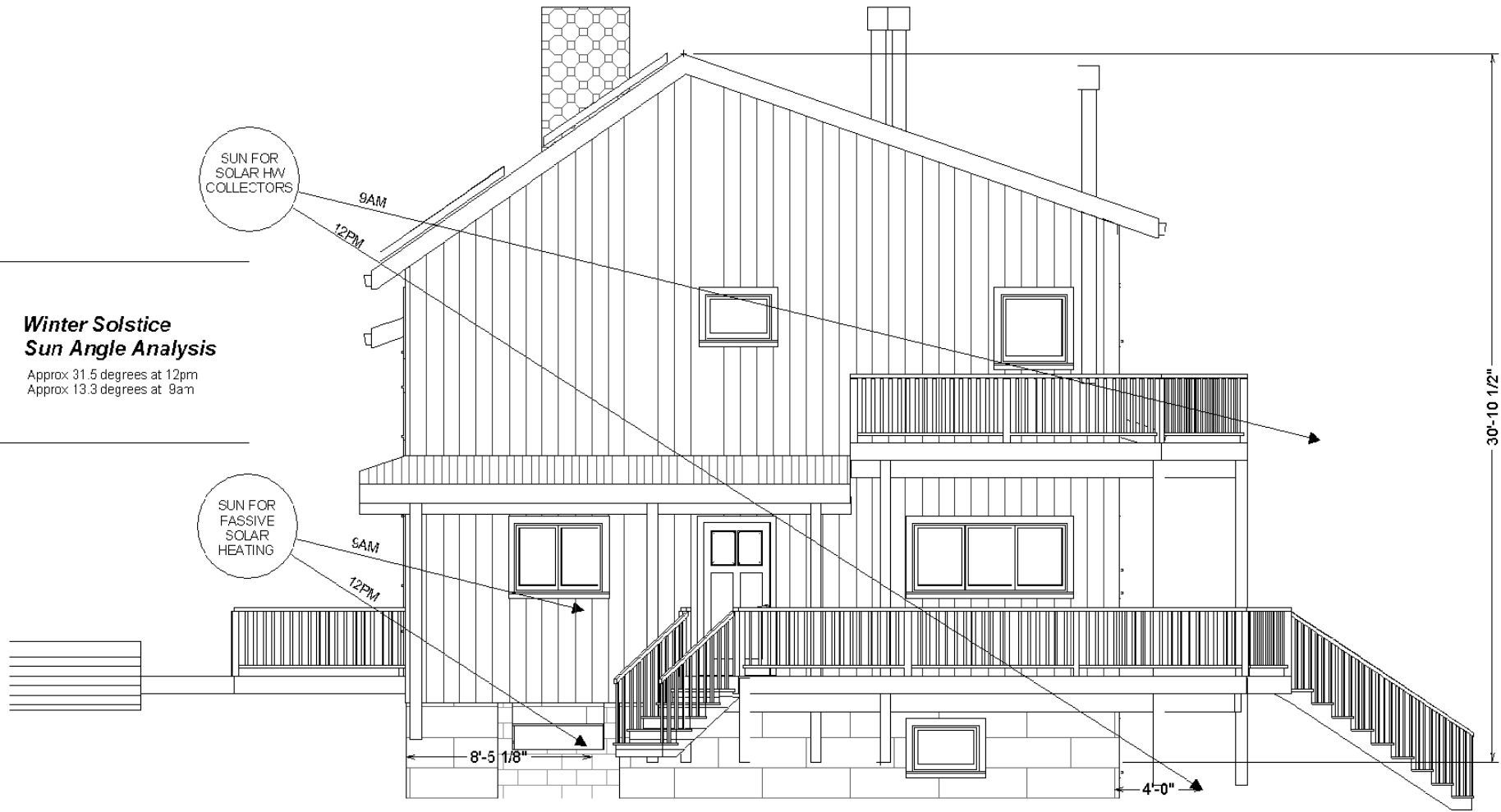
SUN FOR  
PASSIVE  
SOLAR  
HEATING

9AM  
12PM

8'-5 1/8"

4'-0"

30'-10 1/2"



**Project: 2008-05**  
Designer: Thed Johnson  
Date: 3/14/09

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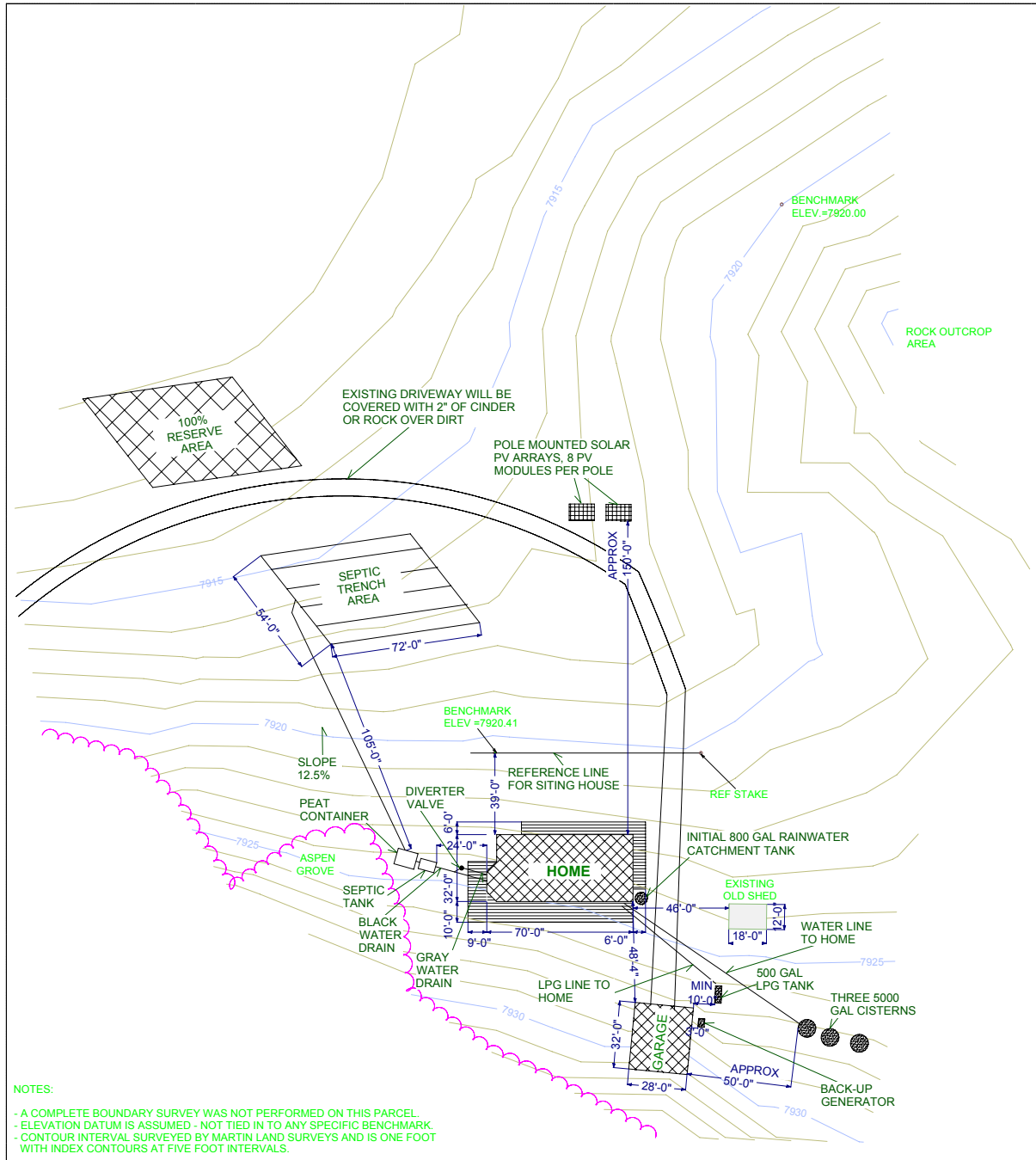
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**Sheet Title:**  
*Winter Sun Angle Illustration*

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**NOTES:**

- A COMPLETE BOUNDARY SURVEY WAS NOT PERFORMED ON THIS PARCEL.  
 - ELEVATION DATUM IS ASSUMED - NOT TIED IN TO ANY SPECIFIC BENCHMARK.  
 - CONTOUR INTERVAL SURVEYED BY MARTIN LAND SURVEYS AND IS ONE FOOT WITH INDEX CONTOURS AT FIVE FOOT INTERVALS.