

1) The home will contain three bedrooms, all with a private bath and walk-in closet, a public bathroom, family room, kitchen, dining room, living room and entry way. A porch will surround the southwest, west and north west sides of the home, and a green house will be attached to the center of the south side of the building to double as a sun room for passive solar heating.

2) The building will be constructed of ICF stem walls, wood frame walls using advanced framing techniques; the floor will be concrete slab as the only thermal mass to store solar heat in the winter and provide a cooling effect in the summer.

3) The roof will be a material that doesn't leach, with rain gutters installed to allow a cistern to be installed in the future to catch rainwater for household supply and irrigation; graywater plumbing will be installed to augment irrigation.

4) Windows on the south side of the building will provide solar heating in the winter for the southwest bedroom, and provide daylighting for all south rooms. Windows on the north side of the building will provide daylighting and ventilation to all living areas on the north side of the home. Windows on the west side are protected by a porch roof to minimize afternoon heating while providing daylighting. Solar tubes will be used to provide daylighting to interior rooms, the hallway and entryway.

5) Solar hot water collectors and large hot water storage tank will provide domestic hot water. Heating and cooling will be provided by a heat pump distributed through duct work. A pellet or wood stove in the family and dining rooms will be used for backup heat.

6) A covered porch will be installed on the west portion of the building to enhance the enjoyment of outdoor living during the summer.

7) Due to the porch and green house on the south side of the home, heating by the sun in the winter will be minimal, however the home will be comfortable due to good wall and roof insulation, and interior thermal mass. In addition, a controllable intake duct will be installed in the green house as part of the air handling system to be able to distribute warm green house air into the home during the winter.

## ***Design Summary and Drawings***

### ***Ranch Style Off-Grid Home in Howard Mesa Ranch, Northern Arizona***



7709 West Painted Rock Trail, Williams, AZ 86046

Designer: Thad Johnson

**Ranch Style Off-Grid Home**

Howard Mesa Ranch  
Williams, AZ 86046

Sheet Title:

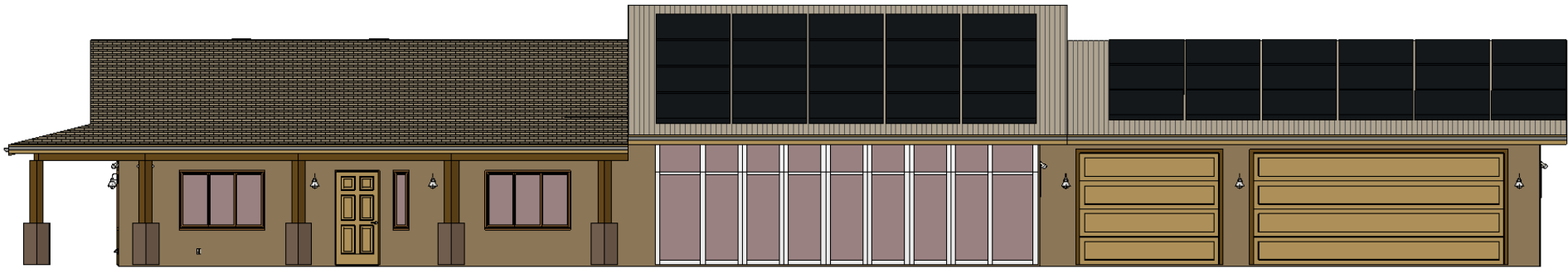
Copyright 2008, SolarTerra LLC

*Design Concept Overview*

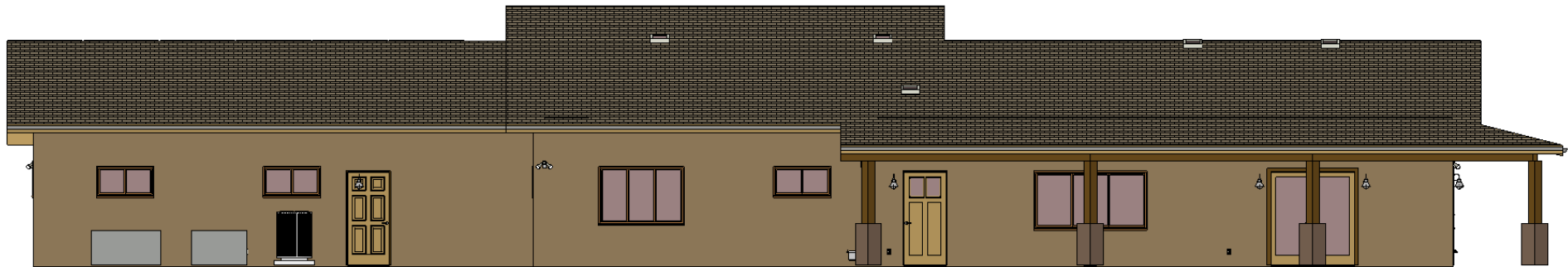
Rev  
A2



Sht  
1



**SOUTH ELEVATION**



**NORTH ELEVATION**

Sheet Title: Copyright 2008, SolarTerra LLC

*South & North Elevations*

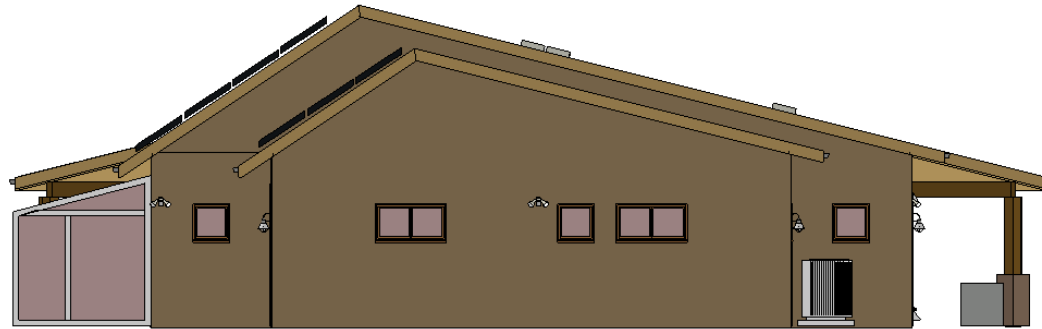
Rev  
A2



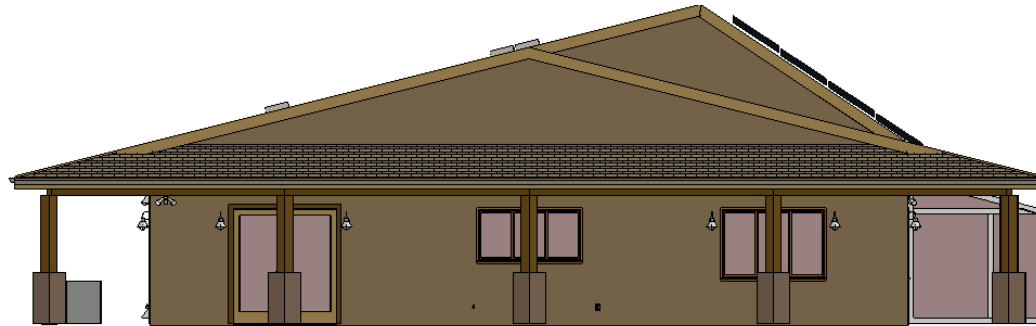
**Ranch Style Off-Grid Home**  
Howard Mesa Ranch  
Williams, AZ 86046

Designer: Thad Johnson

Sht  
**2**



**EAST ELEVATION**



**WEST ELEVATION**

Sheet Title:

*Side Elevations*

Copyright 2008, SolarTerra LLC

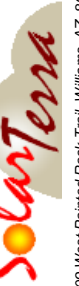
Rev  
A2

Sht  
3

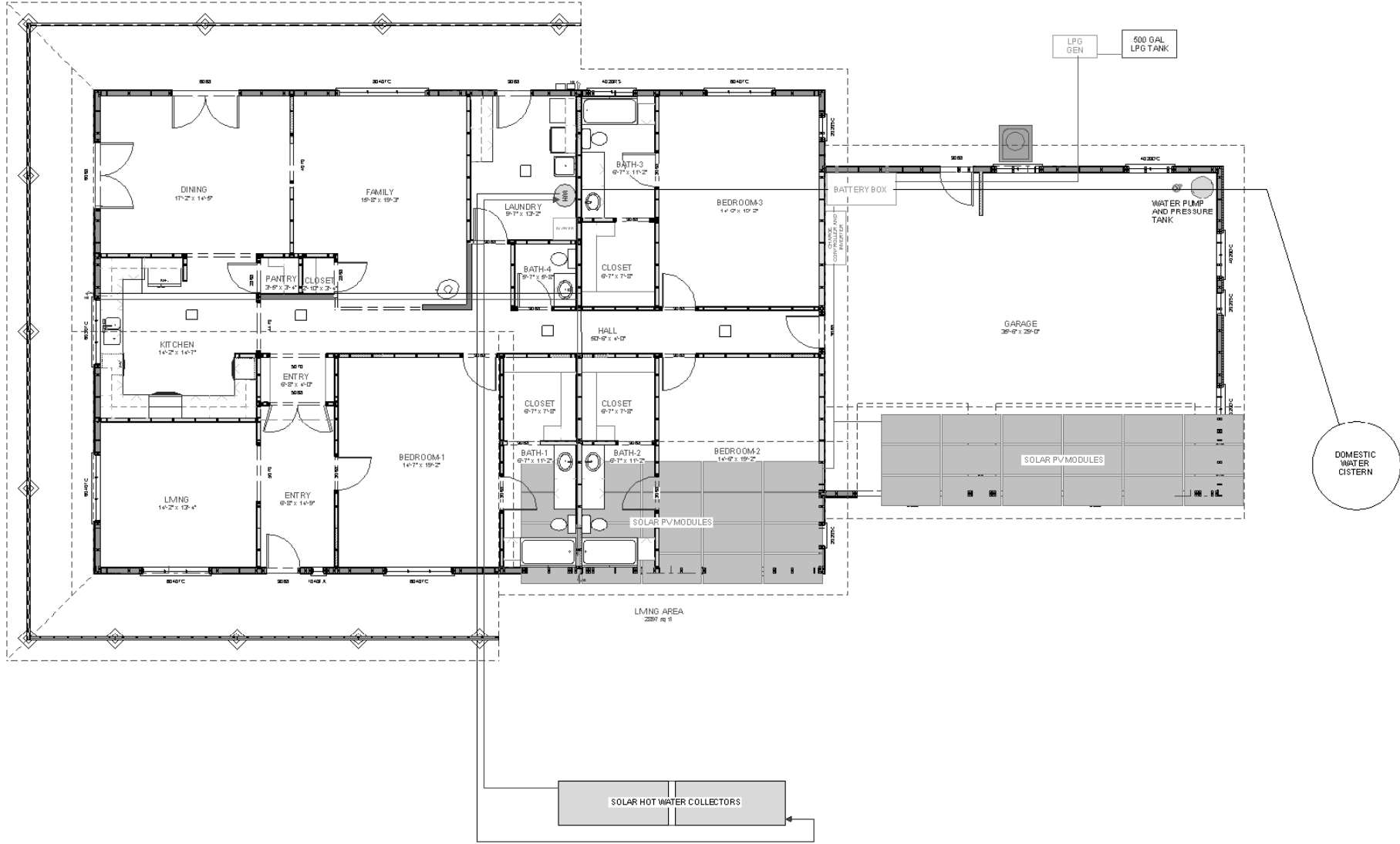
**Ranch Style Off-Grid Home**

Howard Mesa Ranch  
Williams, AZ 86046

Designer: Thad Johnson



7709 West Painted Rock Trail, Williams, AZ 86046



Sheet Title:  
*Floor Plan*

Copyright 2008, SolarTerra LLC

Rev  
A2

**Ranch Style Off-Grid Home**  
Howard Mesa Ranch  
Williams, AZ 86046

Designer: Thad Johnson



Sht  
**4**