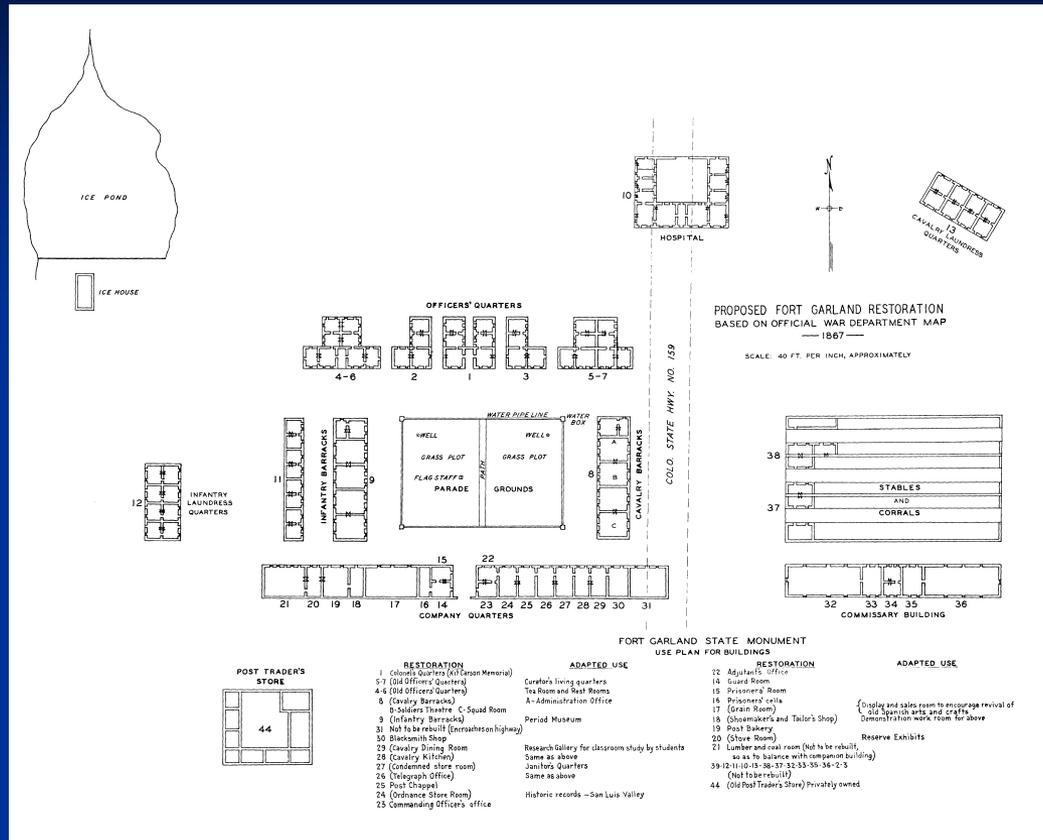


Fort Garland West Officer's Quarters Geothermal Project at the Fort Garland Museum



State's oldest Historic Building using new technology
Located a quarter mile south of highway 160 on highway 159

Fort Garland's History



- The Fort Garland Museum is one of the oldest historic sites owned by History Colorado, the Colorado Historical Society. Built in 1858



Fort Garland was a territorial adobe fort with a garrison of over 100 men. The fort served to protect the earliest settlers in the San Luis Valley until it was abandoned in 1883.



Acquired by the Colorado Historical Society in 1945 and opened to the public in 1950, the fort is one of the society's regional museums showcasing Colorado's history in the San Louis Valley

West Officer's Quarters Remodel Project



The West Officer's Quarters was remodeled in 2006 to make it into a year round exhibit space.

The Building

- 1500 sq/ft with 3' thick adobe walls
- Membrane and earth roof
- No Heating System
- Floor is wood planks on sleepers on ground.

Project Considerations

1. Use of building as a year-round exhibition space.
2. Need for heating and cooling system.
3. Needed a system with a small footprint.
4. Minimal impact on the historic structure.
5. Create a stable environment for artifacts.
6. Consider rising energy costs and limited budgets.
7. Use of **Green Systems**.

Choice:

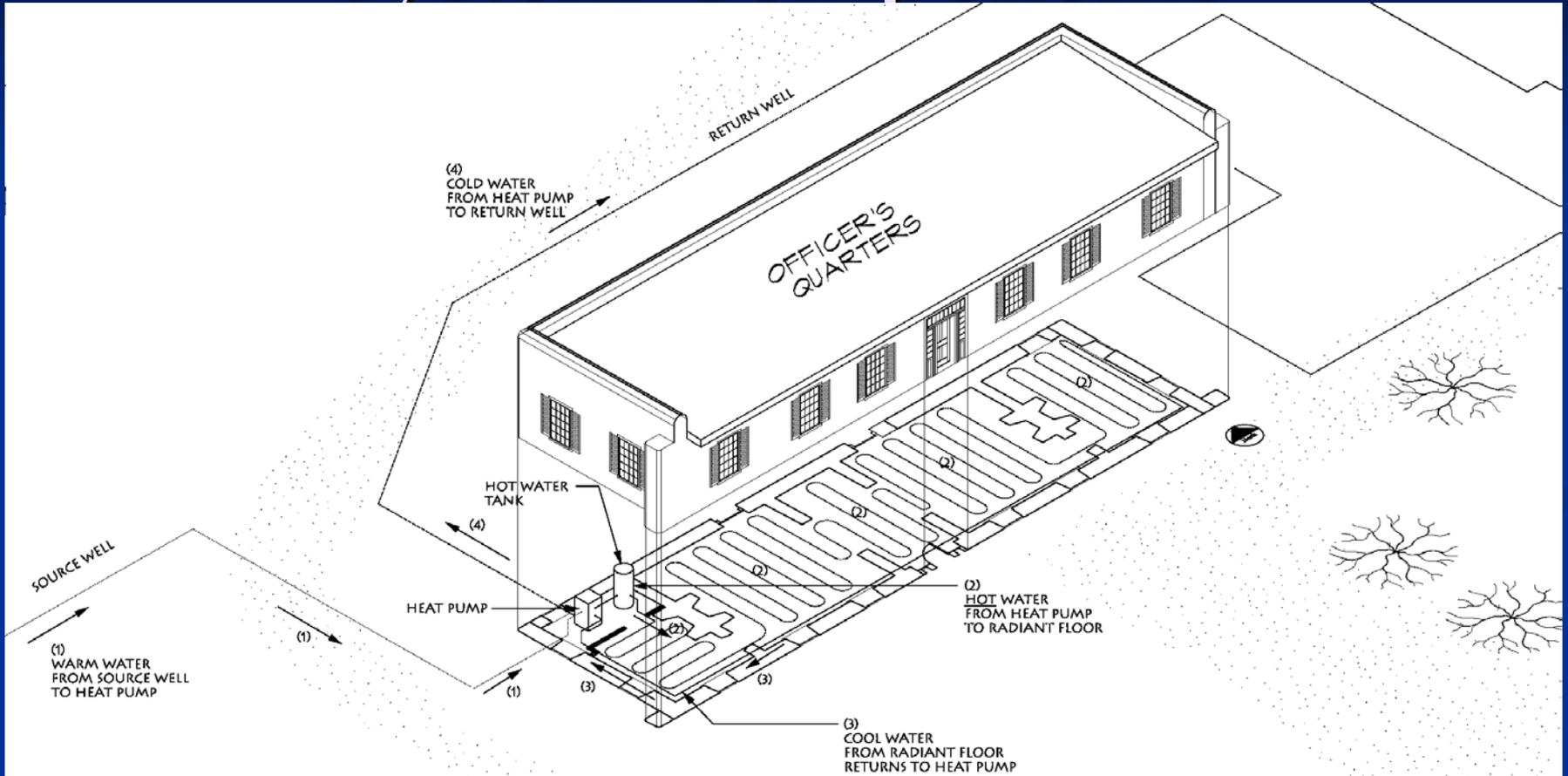
Radiant Floor Geothermal Heat System

1. Minimal impact to the historic structure in installation and building's aesthetics.
2. Use of a low impact energy system.
3. System will both heat and cool the building – single system.
4. Use of renewable energy system that could be combined with other renewable systems in the future.

Overview of the Total System



System Components



RENEWABLE ENERGY AND NEW LIFE FOR 1850'S FORT GARLAND
ADAPTIVE REUSE AND PRESERVATION DESIGN
GROUND SOURCE HEAT PUMP SYSTEM
(WITH SEWARD MECHANICAL SYSTEMS, MECHANICAL ENGINEER)

Construction

Original floor was removed and stored for replacement.



Insulation was installed between joists before new zone lines were run.



Warmboard® System

- Warmboard® System came as a kit from the manufacturer. After being installed the floor was replaced.



Floor re-installed



Heat pump and hot water exchange tank



Pressure regulator tank and manifold



Circulating pump, heat exchanger, manifold and pressure regulator

Exterior construction



- With the new well and exterior lines installed the system was ready to be tested, balanced, and made operational.

Finished



The West Officer's Quarters is open year round and usable for showcasing Colorado's history in a controlled and sustainable environment.

Cost/Benefit

- Well, permit, architectural, engineering, balancing, exterior excavation, plumbing, system, carpentry and adobe repair – \$167,000
- The building will sustain a temperature of 67 degrees year around with only minor adjustment to the floors temperature.

