

Gathering Place

Coeur d' Alene Tribal Housing Authority

Multi Family Construction

Straw bale

Plummer, Idaho



Project Goals

- To construct a multifamily building with an energy efficient envelope that provides a safe and healthy living environment.
 - 🏠 Straw bale walls = R-50
 - 🏠 ERV / Energy Recovery Ventilators
 - 🏠 Wood stove
 - 🏠 Energy Star Appliances
 - 🏠 Fluorescent lighting



Old Agency Site

**12 EXISTING
STRUCTURES**

**LEAD & ASBESTOS
REMOVED FROM
STRUCTURES**

DEMOLISHED

WOOD RECYCLED



Old Agency Site

Beautiful Unused Site

Site Problems

1. Existing Water Source
2. Existing Sewage Lagoons

→ The site could not support additional housing



55,000 Gallon Water Tank

(Site Problem #1)

Bottom Assembly



55,000 Gallon Water Tank

(Site Problem #1)

Side and Roof
Assembly



55,000 Gallon Water Tank

(Site Problem #1)

Completed

- 🏠 New water line down to the building site
- 🏠 Gravity flow
(uses no electricity water)



Sewer Lagoons Solutions

(Site Problem #2)

- 🏠 Build new sewer lagoon to support 24 new units
- 🏠 Sewer lines installed from the new units to the lagoon



Demolition

Remove and
Recycle



Wood Recycling

Sending the wood
to the recycle
plant 38 miles
away



Building site

Grading Site

After removal of old buildings

** The Tribal Fire department and forestry building in the back ground*



Building Pad

- 🏠 Forms for footings
- 🏠 24 inch wide footings
- 🏠 8 inch wide stem wall
- 🏠 4 inch slab on grade over 2 inches ridged foam board



Footing Prep

Forms ready for
concrete



Ready To Pour Footings

Concrete Pump
Truck



Stem Wall

8 inch Thick Stem
Wall



Stem Wall Pour

Poured Footing



Stem Wall

Water Proof
Coating on
Footing and Stem
Wall



Straw Bales

Prep Site for Straw Bale Storage

- 📦 6- mil plastic
- 📦 wood pallets
- 📦 most straw in the United States is burned
- 📦 The amount of straw burned every year would build 2-million homes



Straw Bales For Three Buildings

- Keeping moisture out of straw during storage period
- Straw should have a moisture level of 10% or less before building with it



Exterior wall Post & Beam Framing

Post & Beams
Protected with
Lathing Paper

- 🏠 Straw bale walls have a 2 hour fire rating because of the low oxygen level in the tightly packed bales
- 🏠 Because of the low oxygen level rodents and bugs find it inhospitable



Door & Window

Ready For Stucco

- 🏠 Straw walls have 5 times the resistance to heat transfer compared to a brick veneer wall
- 🏠 Average R value is
- 🏠 Between R 40 and R 50
- 🏠 On a 95 degree day you can expect to have an interior temperature between 68 - 72



Outside Stucco Wire

Corner Detail

🏠 Exterior wire lathe for 3 coats of stucco

- Scratch coat
- Brown coat
- Color coat

Cannot install stucco with temperatures under 40 degrees



Interior Plaster Wire

Interior Wire Different
from Exterior wire

Plaster lathe 2 coats:

- Scratch coat
- Brown coat

Dry wall texture over the
brown coat

*Lime plaster acts as a carbon sink
for the life of the structure- as the
lime absorbs carbon from the air it
turns to limestone. Making the
structure stronger as it gets older*



Interior Wall With Slab On Grade

All Interior Partition
Walls 2 x 4 Framing

Straw is great for sound
absorption, making it
perfect for a multifamily
structure



Weather Proofing Shell

Tenting Building

Very important to keep the straw bales dry at all times during the construction process

- **Wet bales can start to rot**

A well built straw bale structure has a life expectancy of more than 100 years.



Deep Window Wells

14 Inches Deep

2- coats plaster with
a skip trowel drywall
texture



Interior

Living Room

- 🏠 Wood stove chase assembly is 2 x 6 construction with a 2- hour fire rating
- 🏠 No straw is used in the fire chase



Interior

Kitchen Cabinets

2 x 4 wall framed
against straw bale
wall for cabinet
support and
plumbing



Interior

Completed Kitchen

- 🏠 Cherry cabinets
- 🏠 Corian counter tops
- 🏠 Pergo laminate wood flooring



Interior

Closet & Flooring

- 🏠 Entry way closet
- 🏠 Pergo laminated flooring



Interior

Laundry Room

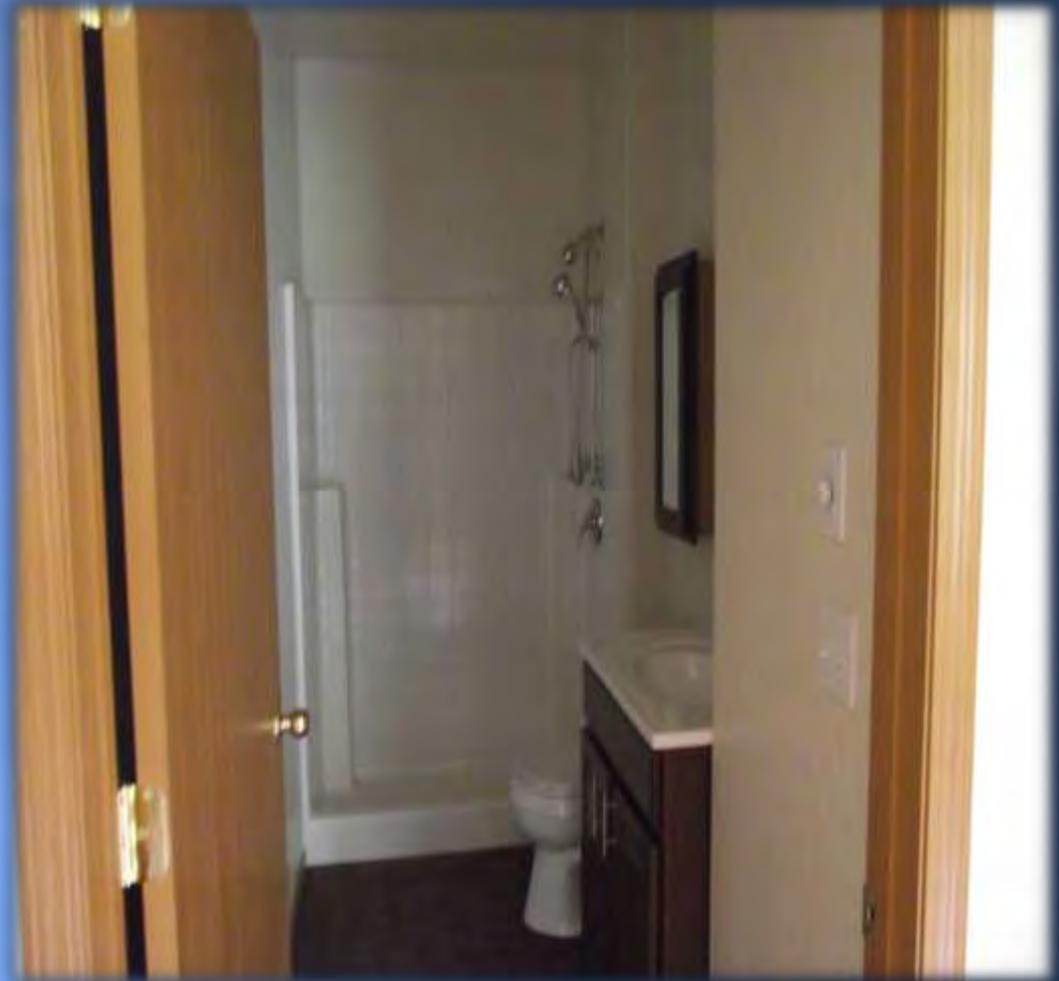
- ❏ Energy star appliances
- ❏ Front load washer & dryer
- ❏ **2" rigid foam** insulation under the hot water heater



Interior

Master Bath

- Low flow shower heads
- Bathroom fans are not required when you install the ERV (energy recovery ventilation) system



Stairs

Stucco Walls
Complete



Trex decking

Second Story Decking

Trex is made from recycled materials

- sawdust and used wood pallets
- recycled plastic grocery bags



Building # 2

Looks Like a Normal
Stick Framed
Building



Buildings

- 🏠 4- Three bedroom units on the ground level
- 🏠 2- Two bedroom units on the second story
- 🏠 Cost was about 25%↑ than a conventional building
 - High cost of stucco and plaster contractors in our area



Backside of Building

Final grading and landscaping should be completed in July with a certificate of occupancy given to us August 1st 2011.

