

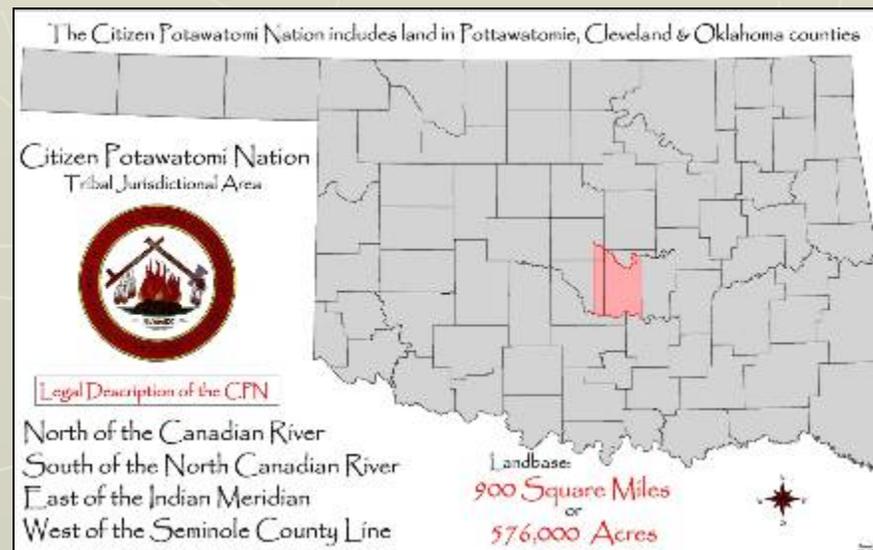
# Citizen Potawatomi Nation

## Father Murphy Phase III



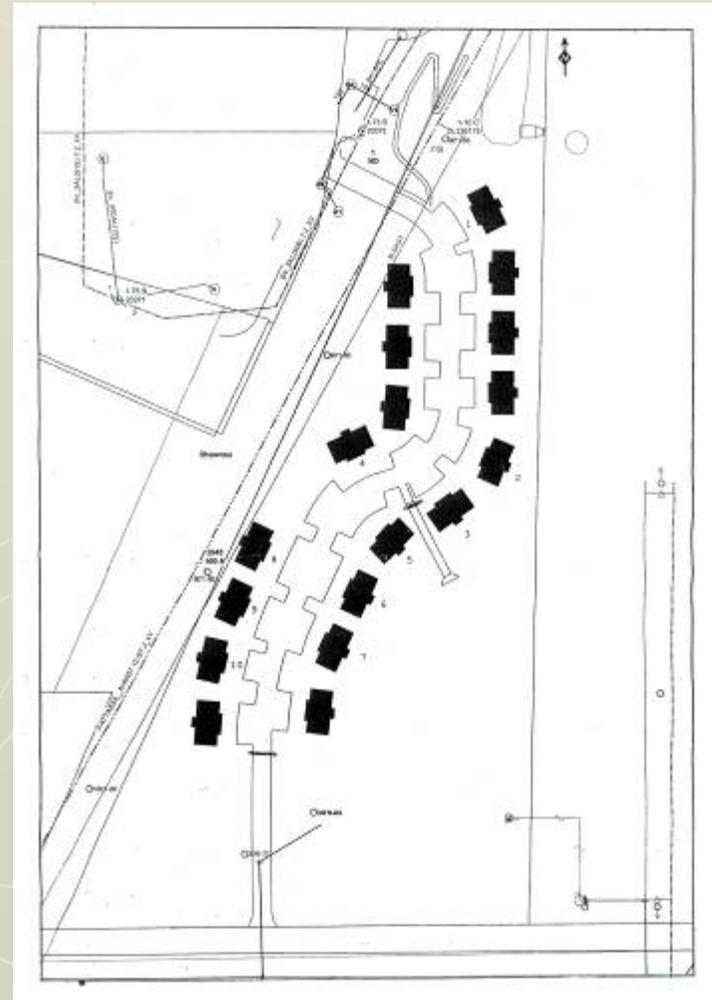
# About the CPN

- ▶ Headquarters in Shawnee, Oklahoma, approximately 35 miles due east of Oklahoma City, Oklahoma.
- ▶ Ninth largest federally-recognized Indian tribe in the US.
- ▶ Tribal population of more than 29,000 tribal member located in every state in the union and 5 foreign countries.



# The Master Plan

- ▶ The duplexes are approximately 1000 sq. feet each.
- ▶ The construction of 10 duplexes is part of an eighteen duplex addition when Phase IV is complete.
- ▶ Utilize the latest advancements in energy efficiency.



# The Master Plan

- ▶ Plan for tribal elder housing in conjunction with the medical clinic, elder nutritional program and wellness center.
- ▶ Phase III consists of 10 duplexes with infrastructure including concrete roads, water and sewer.
- ▶ In order to obtain economies of scale, the infrastructure for phase three also includes necessary roads, water and sewer for phase four of the elder housing project.



# Spray Foam Insulation

- ▶ Housing designed to be practical and conducive to facilitate economical and safe use by elders.
- ▶ The housing units will be constructed with six inch exterior walls utilizing polyurethane spray foam insulation.
- ▶ The polyurethane insulation will be applied as open-cell foam to form a continuous, solid, and air tight layer within the outer walls of the ten duplexes.
- ▶ The R value for the walls is 24 and the ceiling is R-32.



# Spray Foam Insulation

- ▶ Before and After shaving of the excess foam.



# Solar Energy

- ▶ Solar panels are installed on the roofs of the ten duplexes.
- ▶ Each home has 10 panels, equal 2.3kW DC and produce on average, 222kWh per month.



# Solar Energy

- ▶ OG&E, the electric company, have each residence set up with the capability to Net Meter.
- ▶ The unit will consume any electricity being generated instantly through the main power panel.



# Solar Energy

- ▶ If there is no demand, i.e. the house is not consuming electricity because the residents are away and the house is shut down, then a Net Metering credit is established and will be credited to the monthly bill.



# Solar Energy

- ▶ This solar Electric system's increases the value of facilities in several ways. They reduce or eliminate the energy operating cost of the facility and they hedge against or eliminate the effect of electric inflation.

System AC Rating For	18%	offset based on	1,150 KWh consumed per month.
Current cost per KWh used for calculations			0.1
Calculated Current daily consumption of electricity			37.70 KWh/day
Peak PV required to perform offset			2.20 KW DC STC
System AC power Rating			1.69 KW AC
Solar isolation for your area is			4.52 kW/meter sq <sup>2</sup> /day
Estimated system production flat rate (KWh /day)			6.8 kWh
Estimated system production flat rate (KWh /month)			207 kWh
Estimated system production rate (KWh /year)			2,490 kWh
Value of monthly energy savings (year 1)			\$20.75
Value of annual energy savings (year 1)			\$248.97
Required area for solar array			154 sq ft
Number of panels in solar system			10
Panel rating			220 Watts each
Optional solar panel manufacturers			<u>Schuco</u>

# The Efficiency of Electric

- ▶ These all electric homes have all CFL and LED lighting and have “ENERGY STAR” rated doors and triple pane windows. In addition, low flow plumbing fixtures will be utilized and the housing staff have an “ENERGY STAR” calculator to assess all equipment needs.
- ▶ The units are two bedrooms, handicap accessible, with refrigerator, range, dishwasher, microwave, and garbage disposal washer and dryer furnished.
- ▶ All “ENERGY STAR” rated which generally use 20%--30% less energy than required by federal standards.



# Geothermal Heat & Air

- ▶ The geothermal system uses the earth's energy to help heat and cool a building. The direct heat/cooling transfer provided by the geothermal system is much more efficient than a traditional HVAC.
- ▶ Four wells per unit approximately 300 feet deep will be used to exchange heat.
- ▶ This process also eliminates the need for a hot water tank.



# Geothermal Heat & Air

- ▶ According to the office of Energy Efficiency and Renewable Energy water heating is the third-largest expense in most homes, accounting for 14% to 25% of a homes expense.
- ▶ Each unit has a state-of- the-art geo-thermal HVAC heat pump with a programmable thermostat.



# Tribal Family Homes

- ▶ 23 duplexes
- ▶ Each unit has a 2 ton geothermal system with the hot water option to enhance the efficiency of the water heaters.
- ▶ Virtually Maintenance Free
- ▶ 1<sup>st</sup> Phase of 11 units completed in 2005
- ▶ 2<sup>nd</sup> Phase of 12 units completed in 2007



# Living Space



# Kitchen



# Stimulus At Work

- ▶ The Citizen Potawatomi Nation received the money for the project as a complete stimulus grant and chose to use the funds to develop affordable housing for the elderly.
- ▶ The grant is part of The American Recovery and Reinvestment Act funding which is a direct response to the economic crisis.
- ▶ Its three immediate goals are:
  - 1) create new jobs and save existing ones;
  - 2) spur economic activity and invest in long-term growth;
  - 3) provide safe, economical and sanitary housing for elderly.



## **CONCLUSION**

# **Citizen Potawatomi Nation**

## **Father Murphy Phase III**