**Contract No. R-042-052**  
**“Living Stone Lodge – Phase III”**  
Submitted by MHA Nation-South Segment  
Principal Investigator: Jessica White Plume

## PARTICIPANTS

<table>
<thead>
<tr>
<th>Sponsor</th>
<th>Cost Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHA Nation-South Segment</td>
<td>$518,962</td>
</tr>
<tr>
<td>Subtotal Cash Cost Share</td>
<td>$518,962</td>
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<tr>
<td>North Dakota Industrial Commission</td>
<td>$398,850</td>
</tr>
<tr>
<td>Total Project Cost</td>
<td>$917,812</td>
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Project Schedule – 13 months  
Contract Date – 2/10/2020  
Start Date – 2/1/2020  
Completion Date – 3/31/2021  

Project Deliverables:  
Progress Report for 2/20 – 4/20: 5/31/2020 ✓  
Progress Report for 5/20 – 7/20: 8/31/2020 ✓  
Progress Report for 8/20 – 10/20: 11/30/2020 ✓  
Progress Report for 4/21 – 7/21: 8/31/2021*  
Final Report: 11/30/2021*  
*Denotes change to original contract.

## OBJECTIVE/STATEMENT OF WORK:

The purpose of the project is to develop and commercialize affordable, energy efficient homes that surpasses ENERGY STAR rating and can be easily built on rural Native American Reservations. The goal is to reach net-zero energy use and construct the home for under $100 per square foot.

## STATUS:

The contract has been fully executed.

### June 2020

Renewable energy strategy for electrification  
- Electrification is approximately 70% complete and expected to be finalized in the next four weeks. The research and modeling for ground performance for geothermal has been completed.

Model homes constructed with renewable energy (geothermal ground source heat pumps and passive solar energy)  
- The homes are on schedule to be completed within the time frame stated within the proposal.

Renewable energy corridor capable of adding solar or wind energy easily  
- The energy corridor will be started once the architectural and structural drawings are completed.

Custom mold for 22.5 degree ICF Corner Blocks  
- The COVID-19 pandemic has halted business with the Canadian business contractor responsible for designing the mold. It is anticipated the design work will begin in June.

Architectural, Engineering and Electrical design drawings of high-performance home  
- Architectural drawings are 80% complete and structural drawings are 50% complete. Expected completion within six weeks.
Detailed shop drawings with all specifications for manufacturing
- Architectural and structural drawings have been completed for steel parts and sent to the production shop where they are tooling up to manufacture the parts. Drawings still to be completed include: SIPS roof panels and ICF Block Wall Design.
- Detailed mechanical and electrical shop drawings will begin once the electrification conversion plan is complete.

**September 2020**
Renewable energy strategy for electrification
- Electrification is 100% complete. The research and modeling for ground performance for geothermal and air-to-water heat pump has been completed.

Model homes constructed with renewable energy (geothermal ground source heat pumps and passive solar energy)
- The homes are on schedule to be completed within the time frame stated within the proposal.

Renewable energy corridor capable of adding solar or wind energy easily
- The Structural & Architectural engineers have agreed on the energy corridor design and drawings are in process.

Custom mold for 22.5-degree ICF Corner Blocks
- The design work for the custom mold has been completed. The manufacture will build the mold when they receive payment, which has been delayed due to the impact COVID has had on the administrative offices of MHA Nation.

Architectural, Engineering and Electrical design drawings of high-performance home
- Architectural design drawings are 95% complete. Engineering drawings are 75% complete. Electrical drawings have been started and are expected to be complete in quarter three.

Detailed shop drawings with all specifications for manufacturing
- The SIPS roof panels and ICF Block Wall shop drawings and specifications are completed and the manufacturers are set to produce the parts.
- There are drawings for pre-manufactured wedges for the upper loft deck that still need to be completed, as well as a new window buck system that reduces heat transfer. Manufacturing partner network established for all required home components. All manufacturers, with the exception of a sealant manufacture, have been identified for this network and all contracts are in place.

Published Builder’s Manual
- The initial outline, chapters, content and design layout are in process. The photography and drafting illustrations have been ongoing since February. Photographs are key to the visual manual and are being taken as the project is being completed to provide accurate training images.

**December 2020**
Renewable energy corridor capable of adding solar or wind energy easily
- The Structural & Architectural engineers have agreed on the energy corridor design and drawings are completed.

Custom mold for 22.5-degree ICF Corner Blocks
• The design work for the custom mold has been completed. The manufacturer is currently building the mold.

Architectural, Engineering and Electrical design drawings of high-performance home
• Architectural design drawings are 95% complete. Engineering drawings are 75% complete. Electrical drawings have been started. All drawings are expected to be completed in quarter four.

Detailed shop drawings with all specifications for manufacturing
• All manufacturers have been identified for this network and all contracts are in place.

January 2021
A no cost extension has been requested and granted due to Covid related delays.

May 2021
Create a Renewable Energy Plan for Modifying Living Stone Lodge Home Design
• Architectural drawings are 100% complete and structural drawings are 90% complete.
• The design and engineering for the Energy Corridor are 100% complete.
• The Renewable Energy Plan is 95% complete. We’re still waiting for matching components with engineered design.

Develop manufacturing process and affordable efficiencies for commercialization.
• The shop drawings are still being developed as we are analyzing current market conditions and modifying material needs to reduce costs. Material prices have spiked due to COVID’s impact on supplies. The material selection is being redone based on affordability. For example, concrete walls are now less costly than lumber walls currently.
• The geothermal heat pump drawings are now complete. The shop drawings are still being developed for the structural designs due to the changes from increased costs of materials.
• The ICF Custom Mold is 100% complete.
• Creation of the Builder’s Manual is ongoing.

Build Two Model Homes
• All the windows, doors and siding are done for both homes. The roofing and interior framing is complete. The electrical wiring is 70% complete. The mechanical systems have yet to be completed.

Updated 5/11/21