

North Dakota Renewable Energy Program Status Report

Recipient: MHA Nation
Contract Number: R-042-052
Report for time period of: 2/01/20 - 5/20/20

Description of Project

The project includes the third phase of a round residential design that will exceed ENERGY STAR standards and be engineered with the capacity to meet net-zero goals. Construction methods, materials, and production efficiencies achieved during the project will result in a renewable energy home kit and ready to manufacture at an affordable price.

Project Tasks

Objective 1: Create a Renewable Energy Plan for Modifying Living Stone Lodge Home Design

Progress Achieved:

Task: Modify Architectural & Structural Drawings

Architectural drawings are 80% complete and structural drawings are 50% complete. Expected completion within six weeks.

Task: Design & Engineer Energy Corridor

The energy corridor will be started once the architectural and structural drawings are completed.

Task: Design & Engineer Electrification Conversion

Design and Engineering for the electrification conversion is 70% complete and expected to be complete within four weeks.

Task: Create Renewable Energy Plan

The Energy plan will be started once the above tasks are completed.

Objective 2: Develop manufacturing process and affordable efficiencies for commercialization

Progress Achieved:

Task: Design Detailed Architectural & Structural shop drawings and specifications

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.

Task: Design Detailed Mechanical & Electrical shop drawings and specifications

This task will begin once the Objective one tasks have been accomplished and the electrification conversion plan is complete.

Task: Develop ICF Custom Mold

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.

The project development team has created a process to achieve similar results to ensure the project moves forward until this mold can be completed. Amvic, the manufacturer, has agreed to custom cut the ICF corner blocks to replicate a molded block until the custom mold is produced.

Task: Engage Manufacturers for Parts and Production Bids

Rock Industries: The steel parts contract is completed and Rock Industries is beginning production on the parts.

Bertch Cabinets: The replicated, affordable designs are completed and the order is being negotiated for delivery in July.

Farrow Roof Trusses: Custom designed trusses for loft frames and fixtures are completed. Pricing has been established and the order will be filled in July.

Bayer Built Doors: Interior and Exterior doors have been designed to LSL specifications for maximum efficiency and affordability. The entire order has been received on site and is stored in the Living Stone Lodge warehouse.

Pella Windows: A direct manufacturer buying relationship has been established with Pella Windows. The windows have been priced, ordered, and are arriving June 3, 2020.

Manus Products: Adhesive foam kit for the roof panels and exterior doors is being priced. Testing of the samples has been completed and approved.

Intercept SIPS Panels: Contract and designs are in process. Expected to be complete by the middle of June.

Task: Manufacture and Production for Home Parts To Be Delivered June/July

This schedule has been impacted by the lock-down due to the COVID-19 pandemic, which closed some of the manufacturers we work with, but the parts are expected to be received in June, July and August and the delay will not impact the homes' completion during the 2020 building season.

Task: Create a Builder's Manual

The contract has been signed and the initial outline with chapters and design layout is in process and on schedule. Photography and drafting illustrations have been ongoing since February and are also on schedule.

Objective 3

Build Two Model Homes

Progress Achieved:

All excavation on the home sites and the underground and rough-in plumbing are completed. Both concrete foundations have been poured and are completed. The electrical contract with McKenzie Electric has been signed and the construction for onsite power has begun.

We are on schedule to complete the homes within the time frame stated within the proposal.

Objective 4

Progress Achieved: TBD

Tasks for Objective 4 include audits, a comparison report and verification of performance at the end of the project once the construction of the homes are complete.

Deliverables

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.

Manufacturing partner network established for all required home components

All manufacturers have been identified for this network and all contracts are either in place or currently being negotiated for ongoing direct manufacturing relationships.

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.

Energy audit and documentation of energy performance goals

TBD

Manufacturing-ready, affordable, energy efficient Kit Home

TBD

Expenditures

EXPENDITURES FOR THIS REPORTING PERIOD ONLY				
Project Expense	NDIC	REP Recipient	Other Sponsor	Total
Architectural Design Drawings				
Structural Engineering-CW Structural	\$13,244			\$13,244
Mechanical and Electrical Engineering	\$2,176			\$2,176
ICF Form Modifications	\$7,500			\$7,500
2 Single Family Home Construction		\$115,120		\$115,120
Thermal Conductive Concrete Specialist				
Energy Audit & Comparison	\$3,500			\$3,500
Development & Printing Visual Builders Manual	\$24,200			\$24,200
Manufacturing Setup Costs				
Project Manager Personnel	\$22,938			\$22,938
Indirect Costs		\$5,815		\$5,815
Total	\$73,538	\$120,935		\$194,473

CUMULATIVE EXPENDITURES				
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