Karlene Fine, Executive Director
North Dakota Industrial Commission
State Capitol – 14th Floor
600 E. Blvd Ave. Dept. 405
Bismarck, ND 58505 - 0840

July 17, 2019

Dear Karlene and REP Grant Reviewers:

This letter is to indicate our intent to submit on behalf of MHA Nation South Segment 2019 Renewable Energy Program proposal "Living Stone Lodge". Our $100 application fee is enclosed.

The first phase of our program is completed, with the completion of the model "Living Stone Lodge" home. Living Stone Lodge Initiative was pursued with the goal of designing a home that is energy efficient, and safe and suitable for any climate, while integrating our traditional Mandan building innovations (earth lodges). Our resulting round model home was a great success, and was the first place winner of the IFC Builder Awards for small residential homes. This was a great closing point for phase one of our project.

Our current application to the SEP Grant call will support Phase Two of the Living Stone Lodge Initiative, which is to build two more homes in 2019. As part of Phase Two, we are improving our energy efficiency to achieve "net zero" energy, and preparing our designs for commercial production, meeting a critical housing need in Indian country.

I understand that this particular grant requires a 50% match. With a total budget of $917,812, we are prepared to provide a cash match of $518,962, as well as providing in-kind indirect cost.

For more information, please feel free to contact Jessica White Plume in our grant writing department at 701-421-0420.

Thank you for your consideration.

Cory Spotted Bear

Cory Spotted Bear
MHA Nation South Segment Councilman and Representative

Renewable Energy Program

North Dakota Industrial Commission

Application

Project Title: Living Stone Lodge

Applicant: MHA Nation - South Segment

Principal Investigator:

Jessica White Plume

Date of Application: October 18, 2019

Amount of Request: $398,850

Total Amount of Proposed Project:

$ 917,812

Duration of Project: 13 months

Point of Contact (POC):

Jessica White Plume

POC Telephone: 701-421-0420

POC Email: jwhiteplume@mhanation.com

TABLE OF CONTENTS

Abstract	**1**
Project Description	**2**
Standards of Success	**9**
Background/Qualifications	**11**
Management	**12**
Timetable	**13**
Budget	**14**
Tax Liability Statement	**15**
Confidential Information	**15**
Patents/Rights to Technical Data	**15**
Attachments	
Tax Exempt Form	**A1**
Energy Comparison Report	**A2**
Energy Monitoring Services	**A15**
Energy Consumption Data	**A18**
Support Letters	**A20**
Management Team Resumes	**A27**
Budget Detail	**A54**
Vendor Quotes	**A64**
Brochure	**A89**

ABSTRACT

Objective:

To develop and commercialize an affordable, energy efficient home 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.

Expected Results:

The proposed project is phase III of ongoing efforts to bring energy efficiency and sustainable construction to Native American families where there are critical housing shortages. The results of the project include 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 ready to manufacture at an affordable price.

The Living Stone Lodge (LSL) home design was envisioned with Native American families, harsh climates and energy efficiency in mind. MHA Nation South Segment along with Geordan Traver, project specialist, have developed an energy efficient residential home project utilizing hydronic heating, passive solar gain, and building envelope techniques. A prototype round home was built in Twin Buttes in 2018 and won first place in the ICF Builders awards at the World of Concrete show in 2019.

The proposed project includes developing a renewable energy strategy; adding a geothermal ground source heat pump, and engineering an electrical/mechanical energy corridor for conveniently adding renewable energy such as wind or solar to achieve a net-zero energy goal. Commercialization objectives include packaging the building components into a kit that can be delivered onsite to buyers along with a builder's manual to support local workers in safely constructing the home with quality outcomes. The Living Stone Lodge project will bring affordable, energy-efficient homes to Native American tribes across the nation.

Duration: 13 months

Total Project Cost: $ 917,812

Participants: MHA Nation South Segment; Jiran Architects & Planners; Prairie Engineering; CW Structural Engineers; DMA Engineering; Home Energy Science; Amvic Building System; Enercept; Maritime Geothermal; Rock Industries Corporation; ENZO Energy Systems Supplies; National Renewable Energy Laboratory (NREL): DOE; Seed Stock Media.

PROJECT DESCRIPTION

Objectives:

1. Create a renewable energy plan for modifying the Living Stone Lodge home design for renewable energy and net-zero certification.

2. Develop manufacturing and affordability efficiencies in the design and construction process.

3. Apply a renewable energy plan in the construction of two homes.

4. Audit homes and measure energy performance against Energy Model, ENERGY STAR Home requirements, and net-zero goals.

Methodology:

This proposal is for **Phase III** of a home design project that began over ten years ago. Living Stone Lodge (LSL) was envisioned with Native American families, harsh climates and energy efficiency in mind. Design calculations were based on the wide range of temperature fluctuations seen in North Dakota as well as the historic, cultural design of Native American tribes. Guided by Building America's high-performance building assembly best practices[1], the designer considered a wide range of options drawing upon research, technical reports, his own experience, and consultations with industry experts. Decisions were made in collaboration with architects and engineers targeting to exceed IECC 2015, IECC 2018, and ENERGY STAR standards.

A round design with a central skylight was chosen for several reasons. It is the most energy efficient building shape, has superior structural strength, and aligns with Native American culture. For the same square footage as other shapes, a round building minimizes exterior surface area reducing heat loss or gain. Winds naturally flow smoothly around the building with less air leakage. The open floor plan with high sloped ceilings is ideal for passive solar heating and natural cooling. "The natural thermal dynamics of the space requires little external energy to circulate temperature. Heated air rises until it reaches the cooler skylight, then cools and drops to the floor. This action constantly circulates the air and temperature of the home."[2]

[1] Building America. (2011). *Builders Challenge Guide to 40% Whole-House Energy Savings in the Cold and Very Cold Climates.* Building America Best Practices. Vol 12.

[2] https://inhabitat.com/why-our-ancestors-built-round-houses-and-why-it-still-makes-sense-to-build-round-structures-today/.

A round residential building requires less material, reduces the environmental impact of construction, takes less time to build, and is less costly. The round shape also mirrors the design of traditional Mandan earth lodges and other tribal designs such as Navajo hogans, Apache wikiups, and Inuit igloos.

- Phase I included building a prototype home.
- Phase II includes building 3 more homes using the knowledge gained and adding sensors to measure energy performance over 24 months.
- Phase III (grant proposal) is to build 2 homes with renewable energy capacity that exceed ENERGY STAR standards and to commercialize the design.

Phase I: Prototype Home (Completed)

The concept and design advanced over several years researching building materials, reviewing building systems technology and perfecting the building envelope. The prototype home was completed in Twin Buttes in 2018 with MHA South Segment investment. The prototype home was awarded first place in the 2019 ICF Builders Awards, Small Residential Catagory, at the World of Concrete Show.

The home was built with exterior walls of Insulated Concrete Forms (ICF) and a roofing system of Structural Insulated Panels (SIPS). Hydronic heating and passive solar energy provide efficiency in heating the home. An Energy Audit by Home Energy Science was performed on the home and the auditor stated it was the tightest home he had tested in over ten years of audits. **The LSL Prototype airtightness measured 1.46 ACH50** compared to 18.2 ACH50 of a newer modular home in the same community. ENERGY STAR requirements are no more than 3 ACH50. (see Comparison Report Appendix A2)

ENERGY STAR Certified Homes, Version 3.1 (Rev.09)

Efficiency Feature	Energy Star Zone 7	Living Stone Lodge Prototype
Cooling Equipment	13 SEER AC	20 SEER AC
Heating Equipment	95 AFUE ENERGY STAR gas furnace	95 AFUE ENERGY STAR gas furnace
Insulation Levels	R-49	SIPS roof R50
Insulation Levels	R-Value 19-21	Thermal Mass walls R30
Infiltration Rate	3 ACH50	1.46 ACH50
Window U-Value	0.27	0.22
Door U-Value	Opaque 0.17	Opaque: 0.13
Thermostat	Programmable	Yes
Ducts & Air Handlers	Within Conditioned Space	Yes
Lighting	Light Bulbs 90% of ANSI/RESNET/ ICC Standard 301	Yes - All LED light bulbs
Appliances	ENERGY STAR refrigerators, dishwashers, ceiling fans	YES

Note: Living Stone Lodge Prototype ENERGY STAR efficiency features are at or above requirements.

Although the prototype performed very well using passive solar energy, its purpose was to identify how easily it could be constructed and to test the materials and systems. Phase III goals are to improve energy performance with renewable energy and commercialize the home.

The Living Stone Lodge home design has 2,000 square feet on the main floor with a 600 square foot loft area for storage and family recreation space. Exterior walls are built with ICF blocks for energy efficiency and strength.[3] The insulated walls are set into the ground and rest upon an insulated footing encapsulating a concrete and earth thermal mass foundation. This allows a positive energy effect from the natural earth temperatures in both winter and summer months.

The roof is constructed of (SIPS)[4] supported on wooden glulam beams that are joined together by a steel compression ring and beam saddles at the wall locations. This type of roof system requires no support from the interior walls which allows for flexible interior wall placement and room design. This feature supports any type of floor plan, such as a duplex or triplex, using the same basic building structure.

The home is heated and cooled predominantly with renewable passive solar gain and heating or cooling realized from the insulated ground connection. Currently, a small modulated boiler supplements heat in the winter months and a small mini-split AC unit provides additional cooling in the summer. (The proposed project includes electrification and a renewable energy strategy that will replace the gas boiler.)

Phase II: Build 3 Additional Test Homes (In Process)

The second phase of the project includes building an additional three homes in 2019-2020 using the knowledge and experience gained from constructing the prototype. Energy models are being completed by NREL: DOE and Prairie Engineering. A specialized model is being developed by DMA Engineering. All consultants are credentialed in energy performance metrics. (see Energy Consumption Data Appendix A18)

One home will be commissioned with 30 sensors to collect data on temperature and humidity while 8 eGuage meters will be positioned to measure electricity usage of all electrical components in the home including the HVAC system and appliances. The data will be recorded for 24 months and posted monthly on an internet server for public access. The system includes real-time values and long-term reports to compare with the energy model projections. (see Energy Monitoring Services Appendix A15)

DMA Engineering, a Colorado company with expertise in high-performance energy construction, is providing energy performance consulting and designing and commissioning the energy monitoring system. This activity is being funded by the North Dakota State Energy Program.

The Phase II Test homes are being built in Twin Buttes on the Fort Berthold Reservation and funded by MHA Nation South Segment.

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[3] NAHB Research Center. (1997). *Insulating Concrete Forms for Residential Construction: Demonstration Homes.* Report prepared for U.S. Department of Housing and Urban Development.

[4] Oak Ridge National Laboratory. (2011) *High Performance Homes That Use 50% Less Energy Than the DOE Building America Benchmark Building.* Report for U.S. Department of Energy.

Phase III: (Proposal) Renewable Energy Strategy & Commercialization- 2 Homes

The ultimate goal is to make Living Stone Lodge an affordable, net-zero energy home, that is available to tribes across North America. To be poised for this, several objectives are proposed.

Objective 1. Create renewable energy plan for modifying Living Stone Lodge home design for renewable energy and net-zero certification.

Task 1.1 Engineer and develop a plan for electrification conversion of the current residential home design for renewable wind or solar energy applications.

The LSL design team includes LEED Accredited Professionals with expertise in net-zero systems design and broad experience in renewable energy solutions. Using the energy model, this team will work together to create an efficient Energy Use Intensity (EUI)[5] target to develop a renewable energy strategy for the two proposed homes in the Twin Buttes Living Stone Lodge project. The homes will include an all-electric conversion utilizing a geothermal ground source heat pump to replace the current propane boiler used for heating and domestic hot water. In collaboration with Maritime Geothermal Ltd, an affordable, single-well residential geothermal heat pump design will be developed for the project. Energy modeling and data from the prototype home will be used to create a renewable energy strategy that balances affordability with actual energy requirements.

Task 1.2 Develop an effective mechanical/electrical energy corridor to accommodate adding renewable energy such as wind or solar to the LSL home.

The design team will develop architectural, structural, mechanical and electrical designs for an energy corridor that has the capacity to add solar, wind or other renewable energy to the home at any time during the home's lifetime. This modification provides an easy access mechanical chase from the outside of the home to the mechanical room located in the center of the home. It provides a large opening into the interior of the home to allow ducts, pipes or wires to pass from the outside through the living space into the mechanical room. This access will allow a variety of renewable energy options to be added or upgraded to support the net-zero goal for the home.

Objective 2. Develop manufacturing process and affordability efficiencies for commercialization.

In order to maintain affordability, manufacturing the Living Stone Lodge as a Kit Home is part of the commercialization plan. This ensures it can be built on rural Indian Reservations where access to specialized contractors is limited and costly. LSL is being designed to be built easily allowing general laborers to construct it. The residential structure is designed with prefabricated parts that can be delivered to building sites. This decreases construction costs and provides local jobs. The prototype home was built largely with workers without construction training.

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[5] EUI as defined by ENERGY STAR and expressed as a building's energy use per sq ft per year.

Manufacturers of both the SIPS roof panels and ICF blocks are willing to drop ship to any construction sites in the United States. Other components will be shipped to customers from a distribution center on the Ft. Berthold Reservation.

Task 2.1 Develop detailed shop drawings with complete specifications from design and materials modifications for cost-effective and easily manufactured parts.

The design team will be coordinating the manufacturing details and providing drawings for manufacturers' use in production. Proposed adjustments to the design include utilizing a thermal conductive admixture (a tested, engineered, proven product developed by ENZO Energy Systems Supplies[6]) in the concrete to increase heat conduction. Additionally, steel fibers from Helix Steel Company will also be mixed into the concrete to strengthen it and replace the need for rebar, thus reducing construction labor costs.

Task 2.2 Develop a mold for 22.5 degree ICF corner blocks for mass production.

Amvic Building System, a global leader in ICF Products and the only manufacturer of an R30 wall block, currently produces the ICF blocks for the LSL design. The company will fabricate a custom mold for the corner blocks to decrease the cost and make the walls easier and more accurate to construct for the local labor force.

Task 2.3 Engage manufacturers to produce parts for the two proposed Phase III homes and future sales.

Bid packages will be prepared from shop drawings and advertised with a preference for North Dakota Tribal Businesses and ND Manufacturers. Rock Industries in Ft. Yates is already under contract to produce the steel compression rings for the LSL homes. Other manufacturers will be chosen and a production schedule for delivery dates will be confirmed for the 2020 building season.

Task 2.4 Create supporting documentation (Builder's Manual) for commercialization and distribution of the home design.

A proposed Builder's Manual will provide step-by-step instructions for local workers, carpenters, plumbers, HVAC installers, and electricians to use when constructing a Living Stone Lodge home. The manual is a key component in the commercialization plan. The manual will be 8.5" x 11" and estimated at 400 pages including approximately 200 photographs, 100 illustrations, and straightforward instructions to build the home.

Although it is a simple home to build compared to conventional construction, it still requires some guidance to ensure a successful outcome. Without the proposed Builder's Manual, building a Living Stone Lodge home would require specialized contractors in multiple trades which substantially increases the cost.

The Builder's Manual enables the LSL Kit Home to be distributed widely and built with local workers in Native American communities where there are critical housing needs and high unemployment rates.

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[6]TESTS: CONDUCTIVITY - GEOTHERM in CA; STRENGTH - Sara of Buckhorn GeoTech/DOWL in Montrose Colorado; MICROSCOPY, Dr. Miles in Denver, CO; ACCELERATED AGE TESTING with SALT and THERMAL Shock - Shawn Greenwood, PE, The CTL Group in Illinois

Objective 3. Apply Renewable Energy Plan in Building two net-zero residential homes.

3.1 Build 2 LSL homes during the 2020 building season using the net-zero designs. MHA Nation South Segment and Geordan Traver will act as General Contractor and provide the management for these projects.

Objective 4. Audit homes and analyze energy performance with the Energy Model, ENERGY STAR Home requirements, and net-zero goals.

4.1 Home Energy Science will provide final Energy Audit and comparison reports.

4.2 DMA Engineering will verify the home's performance across net-zero and ENERGY STAR standards to document that the goals of the project have been achieved.

4.3 A Project Case Study will be published and distributed for trade publications, tribal housing authorities, Indian Affairs organizations, and federal HUD office.

Anticipated Results:

The homes built with the renewable energy strategy are expected to exceed ENERGY STAR standards and meet net-zero goals. All aspects of production will be in place by the end of the proposed project and MHA Nation will be set to finalize commercialization plans.

Facilities:

No new facilities are required for this project.

Resources:

The Living Stone Lodge project has a strong team of architects, engineers, and manufacturing partners who've been working on the home design project for several years. Access to their expertise in green building, high performance energy systems, LEED standards, and materials science is in large part the reason the Living Stone Lodge design is on track to accomplish high performance energy goals.

MHA Nation, Twin Buttes South Segment's commitment to the vision of Living Stone Lodge gives the project access to administrative, financial and infrastructure support. Resources available to the project include developed building lots with sewer, water and paved roadway for the proposed construction in 2020 as well as tribal business offices experienced in project management and grant administration.

Techniques to Be Used, Their Availability and Capability:

The techniques used to construct a sustainable, high-performance home design are proven industry methods such as SIPS roof systems and ICF exterior wall blocks. SIPs are tested, high performance, load-bearing panels, energy efficient, and easy to use in

construction[7]. ICF construction is a proven method to provide structural safety[8] and energy efficiency. All other components and systems are readily available. There is great potential to achieve a net-zero energy goal with the proposed project techniques.

Environmental and Economic Impacts while Project is Underway:

Environmental impacts while the project is underway are minimal. Achieving most of the objectives takes place inside existing offices. LSL homes are built with very little waste as most components come prefabricated and are assembled on site.

The economic impact includes additional jobs on the Ft. Berthold Reservation during the construction. Additional revenue will be realized by North Dakota suppliers and manufactures for construction materials and supplies sourced within the state.

Ultimate Technological and Economic Impacts:

Living Stone Lodge may be the first home ever designed with affordability and high energy performance specifically for Native American populations. Packaging and distributing the home as a Kit Home, combined with the ease of construction, and builder's manual support provides an opportunity to mass produce and deliver to reservations across the nation.

The features built into this design offer future building opportunities and increased economic impacts through sales of multi-family housing duplex or tri-plex units to Tribal Housing Authorities. The home's flexible design and energy efficiency allow configuring interiors for commercial businesses such as convenience stores, restaurants, educational facilities or offices. Its energy performance in commercial buildings would substantially reduce their utility costs.

Economic impacts are two-fold. Sales across North America will bring revenue to North Dakota manufacturers and tribal businesses. It will also effectively reduce the economic burden to homeowners, renters, and housing authorities who incur high heating costs for inefficient homes.

Why the Project is Needed:

There is a national need to improve the energy efficiency and renewable energy options in residential buildings. The Energy Efficiency & Renewable Energy (EERE), a division of the U.S. Department of Energy, lists "Improve the energy efficiency of our homes, buildings, and industries" as its third highest priority in the 2016-2020 Strategic Plan. The Living Stone Lodge proposal addresses this need and will be poised to distribute the affordable, energy-efficient home to Native American Reservations.

In the United States, forty percent of on-reservation housing is considered substandard (compared to six percent outside of Indian Country) and nearly one-third of homes on

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[7] Rungthonkit, P., Yang, J. (2009). *Behavior of Structural Insulated Panels (SIPS) Under Both Short-Term and Long-Term Loadings.* Proceedings of the 11th International Conference on Non-conventional Materials and Technologies (NOCMAT 2009).

[8] NAHB Research Center. (2001). *Costs and Benefits of Insulating Concrete Forms for Residential Construction*. Report prepared for U.S. Department of Housing and Urban Development.

reservations are overcrowded.[9] A comprehensive Native American housing needs study states that of the 2013–2015 period, **it would be necessary to build around 33,000 new units to eliminate the overcrowding in tribal areas and another 35,000 new units to replace units that were severely physically inadequate, yielding a total need of around 68,000 new units**.[10]

Housing that is affordable, as well as cost and energy efficient, is in demand on Native American reservations. Indian lands – totaling more than 100 million acres spread across 34 states – are predominantly rural.[11] Rural communities often do not have specialized contractors available locally for the construction of ICF or SIPS systems. The Living Stone Lodge is designed to be easily built by local workers in Indian Country, therefore, lowering the overall housing cost and providing local employment during construction in a predominantly rural market.

STANDARDS OF SUCCESS

The project goals are to develop a renewable energy strategy and establish a commercialization process for mass producing affordable, energy efficient homes for Native American families across the nation.

Project Deliverables

- Renewable energy strategy for electrification
- Model homes constructed with renewable energy (geothermal ground source heat pumps and passive solar energy)
- Renewable energy corridor capable of adding solar or wind energy easily
- Custom mold for 22.5 degree ICF Corner Blocks
- Architectural, Engineering and Electrical design drawings of high-performance home
- Detailed shop drawings with all specifications for manufacturing
- Manufacturing partner network established for all required home components
- Published Builder's Manual
- Energy audit and documentation of energy performance goals
- Manufacturing-ready, affordable, energy efficient Kit Home

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[9] National Congress of American Indians."Housing and Infrastructure." www.ncai.org/policy-issues/economic-development-commerce/housing-infrastructure. Accessed 23, Jul. 2019.

[10] Urban Institute (2017) *U.S.Housing Needs of American Indians and Alaska Natives in Tribal Areas: A Report From the Assessment of American Indian, Alaska Native, and Native Hawaiian Housing Needs.* Report prepared for U.S. U.S. Department of Housing and Urban Development Office of Policy Development and Research Washington, D.C.

[11] National Congress of American Indians (NCAI). *Tribal Infrastructure: Investing in Indian County for a Stronger America*. An initial report by NCAI to the Administration and Congress. 2017

Value to North Dakota

Living Stone Lodge sets a new standard in the development of renewable energy use in affordable home design. Its success highlights North Dakota's innovation in addressing a national housing shortage on Indian Reservations with a residential renewable energy solution. The building concept highlights traditional Mandan design and empowers the state's tribal nations' sustainability efforts.

There is a significant opportunity for the proposed LSL Kit Home to be sold throughout North America with North Dakota vendors supplying key parts for each home produced creating or retaining jobs in manufacturing within the state.

Tribal colleges in North Dakota, United Tribe Technical College and Cankdeska Cikana Community College, are partnering with the project to provide training to their vocational welding and construction students. Discussions are ongoing to train Native American students in building with North Dakota's renewable energy and in constructing the Living Stone Lodge Kit Homes on reservations across the state.

Public and Private Sector Use

There is a demand for the Living Stone Lodge home for both public and private housing on Indian Reservations. It is anticipated that the design will have additional demand for commercial facilities, particularly in states with frigid winters. In 2019, Twin Buttes representatives rented a booth to provide LSL materials and media to the National American Indian Housing Council Conference attendees. Interest from other tribal representatives showed the design and energy efficiencies aligned with their current housing goals for both affordable public housing and private homeownership.

Commercial Use

As well as single-family homes, the design has the potential for use as multi-family duplexes or triplexes and commercial buildings. It is anticipated there will be additional commercial use in the future. For example, Geordan Traver, project specialist, has been approached by Colorado developers about using the home design for rental lodges at mountain ski resorts.

Job Creation

During the 13-month project, jobs will either be created or retained in manufacturing and construction and at the conclusion of the project, Twin Buttes South Segment of the MHA Nation is poised to plan production and sales of LSL Kit Homes.

Once the Living Stone Lodge Kit Home comes on the market, more jobs will be created or retained in the manufacturing sector of North Dakota. Tribal businesses and supply companies will benefit from sales of supplies and materials to produce the home packages. Additionally, all homes sold within the state will create construction jobs at the home site locations on Indian Reservations.

NDIC Goals

The Living Stone Lodge commercialization project promotes efficient, economical and environmentally sound development and use of North Dakota's renewable energy resources.

The unique home design and construction methods encourage and promote the use of proven technologies and materials in non-traditional ways.

The project will create manufacturing and construction jobs related to the utilization of North Dakota's renewable energy resources.

BACKGROUND/QUALIFICATIONS

Applicant Qualifications:

Geordan Traver, Project Specialist, is the project manager for the Living Stone Lodge project. He developed the original Living Stone Lodge design concept and served as General Contractor on the prototype home construction in 2018. His qualifications include the following:

- 26 years of Project Management and Fabrication in Offshore and Industrial construction
- 9 years of Development and Fabrication of Marine and Industrial equipment
- 6 years of Direct Supervision relating to Offshore Construction and Management of support vessels
- 6 years in Management of Marine Fabrication Facility specializing in close tolerance machine work, state-of-the-art Plasma Cutting, Welding Technologies and Design
- 4 years Building Construction Management including 3.5 million dollar New School Addition Mandaree North Dakota
- 5 years Direct Sales and Consulting Agricultural Industry North Dakota

Key Contractors Qualifications:

Living Stone Lodge key contractors have all served the project for several years and maintain extensive and, in some cases, proprietary files and documents of the design.

Jiran Architects & Planners' owner and Principal Architect, Jeff Welch, A.I.A., has been Project Architect on major projects across North Dakota since 1987. St. Alexius Medical Center and MHA Nation Veteran's Affairs Facility are examples of his work.

CW Structural Engineers Chris Wentz, P.E., President, is registered in North Dakota, Idaho, Iowa, Montana, Minnesota, South Dakota, Texas, Wisconsin, and Wyoming.

Prairie Engineering, with offices in Minot and Bismarck, provides mechanical and electrical services and is a US Green Building Council member. Experts in designing energy efficient and low life-cycle cost systems that also fit within a project budget.

Amvic Building System Victor Amend, founder, holds a Bachelor of Engineering and PhD in Building Sciences. The company focuses on performance of the building envelope. The only ICF company producing a wall block with R30 insulation value.

Enercept Structural Insulated Panels (SIPS) Enercept panels have been used in many projects around the world. The largest project utilizing Enercept SIPs is the International Science Station located at the South Pole.

DMA Engineering Brett Guarrero, Senior Engineer, specialist in energy system assessments, design, project management and commissioning for over 25 years. He is certified in geothermal heat pump technology; is a Certified Building Commissioning Professional (CBCP); has received his green building certificate and is active in the USGBC LEED community.

Seed Stock Media owner, Belinda Strotheide, has provided technical writing and publication design services for over twenty years. Her partners specialize in book design and production for training manuals and educational titles. Clients include Discovery Channel Publishing, Chronicle Books and Sierra Club Books.

MANAGEMENT

The Living Stone Lodge project is led by a strong team with specialized expertise and MHA Nation employees from several administrative departments. The Construction Management Department has seven employees who provide oversight and management to ensure that projects stay on budget and meet approved deadlines. They also provide onsite inspections for building code requirements.

Geordan Traver, LSL designer and employee of MHA Nation South Segment, is the project specialist who manages the project's subcontractors in coordination with the Construction Management Department. Jiran Architects evaluates subcontractors' work and makes site visits to review all work for conformance to the design contracts. The MHA Nation Finance Department will administer the grant award funds.

Monthly management meetings will be held with the Living Stone Lodge project team to include the Architect and construction management staff assigned to the project to ensure the evaluation points and timeline deadlines are being met.

During the design phase, bi-weekly teleconference calls will be made with the design team and energy consultants to coordinate the process and completion.

The Living Stone Lodge Project Team

(see Management Resumes Appendix A27)

MHA Nation South Segment

Corey Spotted Bear, Tribal Councilman, MHA Nation South Segment
Geordan Traver, Project Specialist
Diane Traver, Executive Assistant assigned to the project
Jessica White Plume, Grant Writer
Ryan Wagner, Finance Administration
Dennis Fox, Construction Management Department

Contractors

Jeff Welch, Principal Architect, AIA, Jiran Architects & Planners P.C.
Randy Axvig, P.E., LEED AP, Prairie Engineering
Chris Wentz, P.E., President, CW Structural Engineers
Brett Guerero, Senior Engineer, LEED AP, Green Build Certified, CBCP, DMA Engineers
Henry Borysewicz, Residential Energy Efficiency Consultant, Home Energy Science
Belinda Strotheide, Technical Writer/Grant Consultant

TIMELINE

Living Stone Lodge Renewable Energy & Commercialization

13 month timeline - beginning December 2019

Evaluation Points: The grant objectives listed within the grant tasks are the evaluation points that will be managed.

Timeline				QTR report			QTR report			QTR report			Final report
Project in Months	1	2	3	4	5	6	7	8	9	10	11	12	13
Objective 1													
Modify Architectural & Structural Drawings													
Design & Engineer Energy Corridor													
Design & Engineer Electrification Conversion													
Create Renewable Energy Plan													
Objective 2													
Design Architectural & Structural detailed shop drawings and specifications													
Design Mechanical & Electrical detailed shop drawings and specifications													
Develop ICF Custom Mold													
Engage manufacturers for parts and production bids													
Manufacture & Production for home parts delivered June/July													
Create Builder's Manual													
Publish Builder's Manual													
Objective 3													
Build two model homes													
Objective 4													
Complete Energy Audit and comparison Report													
Verification of Energy Performance Goals													
Prepare & Publish Case Study													
REP Reports													

BUDGET

Project Associated Expense	NDIC's Share	Applicant's Share (Cash)	Project Total
DESIGN: Renewable Energy Plan & Electrification			
Architectural Design Drawings	$ 35,000		
Structural Engineering-CW Structural	$ 33,060		
Mechanical and Electrical Engineering	$ 92,636		
CONSTRUCTION: Build 2 Homes			
Home Construction-2 single family models		$ 518,962	
Thermal Conductive Concrete Specialist	$ 20,000		
(M&V) Measurement & Verification			
Energy Audit & Comparison Reports	$ 11,500		
COMMERCIALIZATION			
Custom 22.5 degree ICF Corner Block	$ 55,000		
Manufacturing Setup Cost	$ 28,000		
Development & Printing Builder's Manual	$ 48,400		
PERSONNEL			
Project Manager Salary	$ 75,254		
Total	**$ 398,850**	**$ 518,962**	**$ 917,812**

(see Budget Detail Appendix A54)

Without funding from the North Dakota Renewable Energy Program, the Living Stone Lodge commercialization project will not move forward at this time. Homes will be built only on the Ft. Berthold Reservation. Without the additional design and engineering modifications to increase renewable energy usage, manufacturing details to reduce cost, and without a builder's manual to simplify construction, it will likely take five years instead of one to bring this North Dakota renewable energy home product to market for Native American families who need them now.

TAX LIABILITY

MHA Nation South Segment is a part of the Three Affiliated Tribes, which is a registered tribal government within the state of North Dakota and is not a taxable entity.

CONFIDENTIAL INFORMATION

There is no confidential information in this proposal.

PATENTS/RIGHTS TO TECHNICAL DATA

At the end of the commercialization phase, once the design is modified and completed, available rights will be reserved through applicable copyright or patents.

STATE PROGRAMS AND INCENTIVES

MHA Nation - South Segment Grant Awards from the State of ND

State Energy Program $22,300 Term: 7/1/19 - 5/31/20

APPENDIX

Tax Exempt Form	**A1**
Energy Comparison Report	**A2**
Energy Monitoring Services	**A15**
Energy Consumption Data	**A18**
Support Letters	**A20**
Management Team Resumes	**A27**
Budget Detail	**A54**
Cost Savings Analysis	**A56**
Home Construction Budget	**A57**
Vendor Quotes	**A64**
Brochure	**A89**

Internal Revenue Service

Department of the Treasury

District Director

Person to [illegible]
R. Larson

Telephone [illegible]
237-5771, Ext. 321

Refer Reply to:
CP:E:PL

Date: June 16, 1983

Three Affiliated Tribes
P. O. Box 579
Newtown, ND 58763

Dear Sir:

Your application for registration for Tax-Free transactions under Chapter 32 of the Internal Revenue Code has been approved.

You should retain the enclosed validated Form 637 as a permanent record.

Sincerely yours,

Gary O. Booth
District Director

Form 637 (Rev. December 1981)
Department of the Treasury
Internal Revenue Service

Registration for Tax-Free Transactions Under Chapter 32 of the Internal Revenue Code
(This Application Should Also Be Used by Producers and Importers of Gasoline and Manufacturers of Lubricating Oil)

No. 45-83-0043K
OMB No. 1545-0014
Expires 11-30-84

Please type or print

Name of individual, corporation, partnership, association, etc.
Three Affiliated Tribes

Social Security or Employer Identification Number
45-032 3672

Name under which business is operated
Three Affiliated Tribes

Will you be required to file Form 720? ☐ Yes ☒ No

Business address (Number and street)
Box 579

City, State, and ZIP code
Newtown, N.D. 58763

RECEIVED
FARGO OFF.
45 JUN 01 1983
DIRECTOR INT. REV.
FARGO

File this application in duplicate with your District Director of Internal Revenue. See the instructions on pages 2 and 4.

Application is hereby made for a Certificate of Registry in the name(s) indicated above.
The applicant is a:

☐ Manufacturer ☐ Producer ☐ Importer ☐ Wholesaler ☐ Jobber ☐ Selling or ☒ Buying (specify type of product) ▶ Asf and all Products subject to Fed Excise Tax
☐ Retailer ☒ Other (specify) ▶ Tribal Government

The applicant affirms that use of articles bought or sold tax-free is to be for the exempt purposes specified in applicable provisions of law and regulations and understands that misuse of this certificate will lead to its revocation and/or the penalties provided by law.

See item 2 on page 2 and check applicable letter(s). I qualify as a:

☐ a, ☐ b, ☐ c, ☐ d, ☐ e, ☐ f, ☐ g, ☐ h, ☐ i, ☐ j, ☒ k, ☐ l, ☐ m, ☐ n, and/or ☐ other—(specify) ▶

Under penalties of perjury, I declare that I have examined this application and to the best of my knowledge and belief it is true, correct, and complete.

Signature ▶ Dennis E. Miller Title ▶ Finance Director Date ▶ 5/25/83

Paperwork Reduction Act Notice.—The Paperwork Reduction Act of 1980 says we must tell you why we are collecting this information, how we will use it, and whether you have to give it to us. We ask for the information to carry out the Internal Revenue laws of the United States. We need it to ensure that taxpayers are complying with these laws and to allow us to figure and collect the right amount of tax. If you want to register for tax-free transactions, you are required to give us this information.

District Director's Validation—A Certificate of Registry for the above applicant is approved and issued under the number shown.

Gary O. Booth [illegible] 6/1/83

A1

Home Energy Science

Certified Residential Energy Rating
Level 1 Certified Thermography

Comparison Report

Prepared For:

The Three Affiliated Tribes, South Segment

Living Stone Lodge Project
708 79E. Ave N.W.
Halliday ND 58636

Phone:
Audit Date: 3/16/2019

Introduction

Home Energy Science was contracted to complete energy audits on two homes for the Three Affiliated Tribes. Such audits are intended to reveal ways for a homeowner to reduce energy consumption and/or increase their comfort within the home. Reduced energy consumption results in lower energy bills which results in a lower cost of ownership.

The reports generated for the two homes were created with this end in mind. Each report is focused on that specific home and addresses issues with that home only. This Comparison Report takes the data from those focused reports and compares and contrasts how the different building methods employed in the construction of these homes directly affects the energy usage of the homes, which in turn affects both energy costs and occupant comfort.

Methodology

The energy audits have two main components – an Energy Survey and an Infrared Survey. Two reports were generated for each home to address these components.

Energy Survey

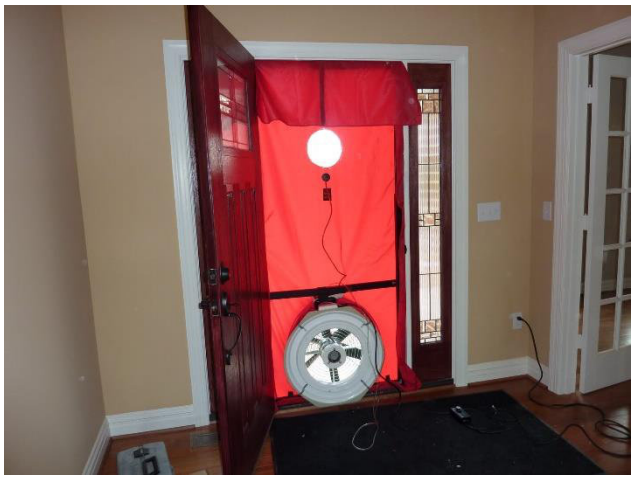
The Energy Survey comprises a visual inspection of the home's thermal envelope, including:

- Foundation
- Above Grade Walls
- Doors and windows
- Ceiling and attic

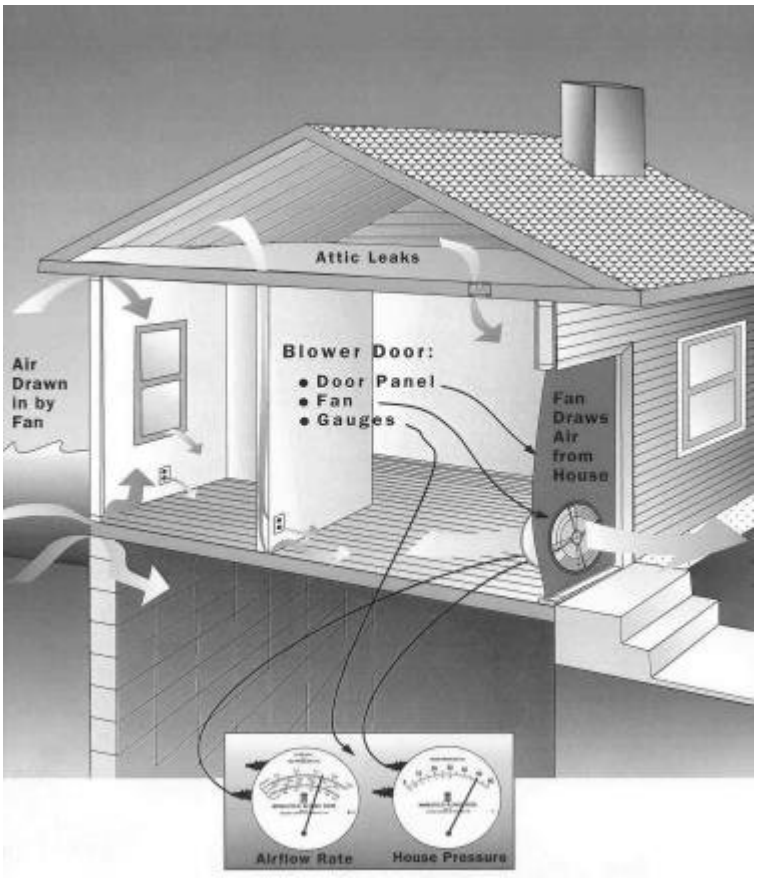
An assessment was made of the home's energy using systems, including:

- Space heating and cooling, including ductwork
- Ventilation
- Domestic hot water production
- Lights and appliances

A Blower Door test was performed as well. A Blower Door is essentially a calibrated fan. The fan is fitted into an exterior door and blows air from the inside of the home to the outside (image, right). This depressurizes the interior of the home. Airflow and pressure are monitored.



The Blower Door test serves two main purposes. First, it provides a way to measure the relative air-tightness of a home. A leaky home wastes energy because it allows conditioned air (heated or cooled air) to escape the building envelope and unconditioned air to enter. Second, the depressurized home can reveal where the leaks are, pointing the homeowner to those places that require attention. (image, left) Air leaking into the home during this test can be felt with the hand or visualized with an infrared camera.



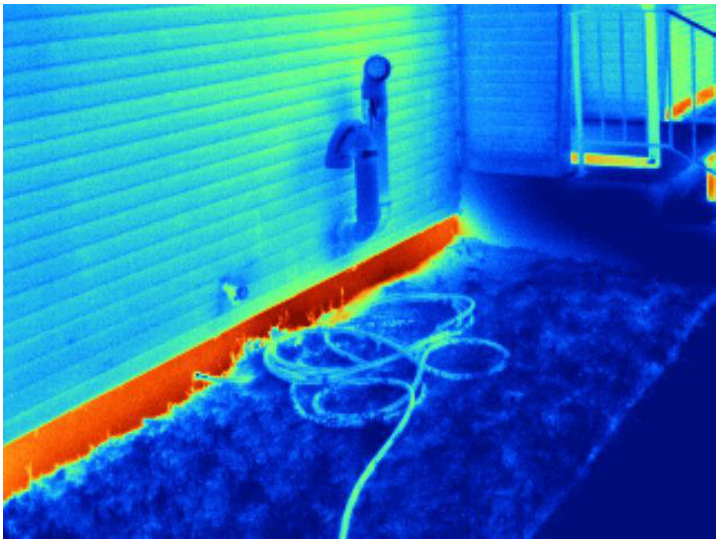
The home is depressurized to a standard pressure (-50 Pascals). The rate of air flowing out of the home (in Cubic Feet per Minute) at this standard pressure is recorded. This number, referred to as CFM50, is used to calculate the relative leakiness of the home, taking into account the home's volume. Since a large home has more surface area than a small one, it will have more places for air to leak. By accounting for volume, we can make comparisons of two different

home's relative tightness. We can also calculate the number of air changes per hour that the home would naturally experience - how often the entire volume of air in the home leak s out.

Infrared Survey

An infrared camera (image, right) is sensitive to heat energy. It allows us to visualize the surface temperature of building structures. This lets us see air leaks, cold spots, and places where heat escapes. The image below shows a warm, uninsulated basement wall radiating heat into the winter air.

In order to be effective, insulation must be installed properly. Fiberglass batt insulation must fill the entire cavity and be encapsulated on six sides (it should be in contact with all six sides of the cavity it is in). There should be no gaps or voids and it should not be compressed. Under proper conditions, it allows us to assess the performance of a building's insulation. Infrared images of each home were included in their respective Infrared reports.



In order to properly assess a structure's insulation using infrared, the American Society for Nondestructive Testing (ASNT) requires a difference of at least 18 degrees Fahrenheit be maintained between the interior and exterior for a period of at least four hours. Field work on both homes was done on the same day, March 16, 2019. The outdoor high temperature that day was 37 F and the indoor temperature was above 70F, so ASNT conditions were met.

Building Construction

Two different building constructions will be compared. The Baumann residence is a conventionally framed home. It is a manufactured home, meaning it was not constructed on-site. It was built in a factory and shipped finished to the site. The Travers residence is constructed of Insulated Concrete Forms (ICFs) and Structural Insulated Panels (SIPs).

Conventionally Framed (Stick Built)
This is the traditional method of wood framed home construction. These homes are built stick by stick, thus known as stick-built. They are typically framed on site utilizing lumber and pre-formed trusses and beams to construct a home. The Baumann residence is stick built.

Pros:

- Traditional design and construction methods
- Many builders and trades people available and trained to build these homes.
- Changes and customization easier to accommodate during construction
- More choice of finishing materials available than other homes
- Can be less expensive to build than other construction methods

Cons:

- Labor intensive
- Hundreds of sticks and pieces must be assembled - each creates a place for potential air leakage
- Weather can cause delays and home is exposed to weather until roof and exterior walls are completed
- Can be wasteful in material usage
- Quality can be difficult to maintain with multiple trades people

Manufactured Homes

Manufactured homes are built in a factory and shipped to the construction site. Cranes lift the modules into place. The Baumann residence is a manufactured home.

Pros:

- Factory construction allows efficiencies and economies of scale compared to site built
- Can be constructed more quickly since weather and trade coordination is not a factor
- Construction time and waste is reduced, decreasing cost for builder and home owner

Cons:

- Shipping clearance on highways and roads can limit module sizes
- Little opportunity for inspection by homeowner since modules are manufactured at factory

SIP (Structural Insulated Panels)

Structural insulated panels are an insulated material sandwiched between two layers of structural material, typically Oriented Strand Board. They come in a variety of thickness and sizes. The Travers residence has a SIP roof.

Pros:

- Panels manufactured in factory conditions
- Solid panels reduce places for air leaks
- SIP's arrive pre-cut, reducing framing
- Labor savings compared to stick-built homes
- SIPs strong – stable in high winds and earthquakes
- High performance insulated panels reduce energy costs of the home.
- Energy costs can be reduced by up to 50%
- No mold in cavities to cause health related issues

Cons:

- Can be more expensive than traditional stick-built homes
- Builders experienced with SIPs may be hard to find

ICF (insulated concrete forms)

Insulated concrete forms are foam forms that are stacked into the shape of an exterior wall. Reinforcing bars are added and concrete is then poured inside the foam to create an insulated concrete wall. The Travers residence has ICF walls.

Pros:

- Walls are solid concrete with insulation on both sides
- Walls are strong, long lasting, resist wear, wind, and even fire
- Two layers of insulation make a better insulated wall than plain concrete or stick built walls
- Solid concrete walls also provide sound insulation
- Properly designed ICF walls will withstand tornadoes, hurricanes, and fire
- Some insurance companies will provide discounts for this type of building system
- There is less repair and maintenance over time
- ICF walls can be customized to build curves and angles
- Any exterior finish can be attached including stone or brick veneer
- Labor and material savings over stick-built

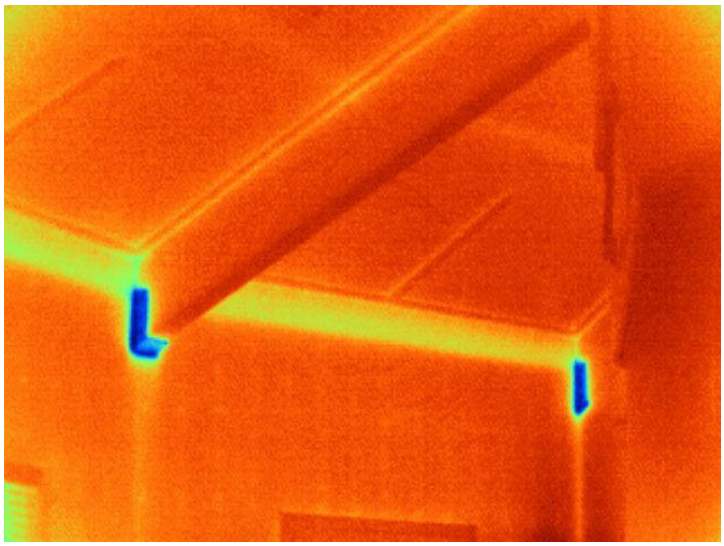
Cons:

- Can be more expensive than traditional stick-built homes
- Builders experienced with ICFs may be hard to find

Comparison

From an energy efficiency point of view, there were dramatic differences between these two homes. The new construction materials and techniques used in the Travers residence are a vast improvement over the conventional building techniques in the Baumann residence. Infrared imagery reveals this vividly.

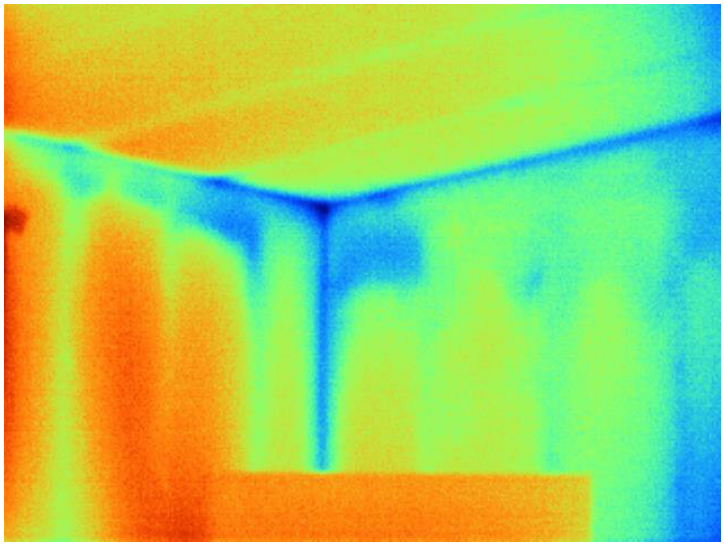
Insulation

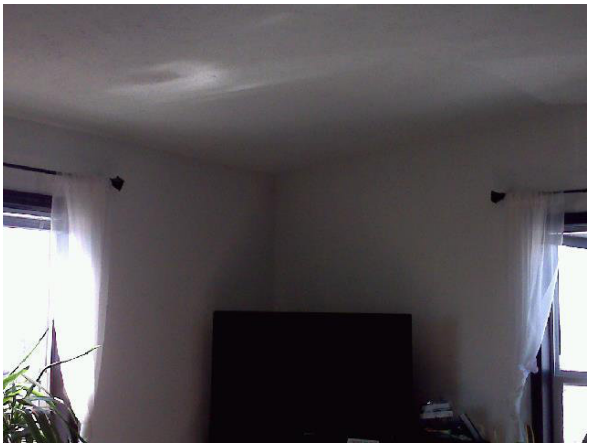


This IR image (above) shows the uniform warmth of the ICF walls and SIP roof of the Travers residence. In these images, warm surfaces are red. Yellow is slightly cooler. Blue surfaces are the coolest. The visible light image on the right is included for reference. The IR image is slightly zoomed in compared to the visible light image.

Only the metal saddles which hold the roof beams appear cold. These saddles appear colder than the walls because they are imbedded in the interior of the concrete wall for strength. The wall is insulated on both faces. Since the saddles are in the wall, they extend past the interior face of insulation. Only the exterior face of insulation protects them from the outside cold, so they are actually a bit colder than the interior wall.

Contrast this with the images on the next page.

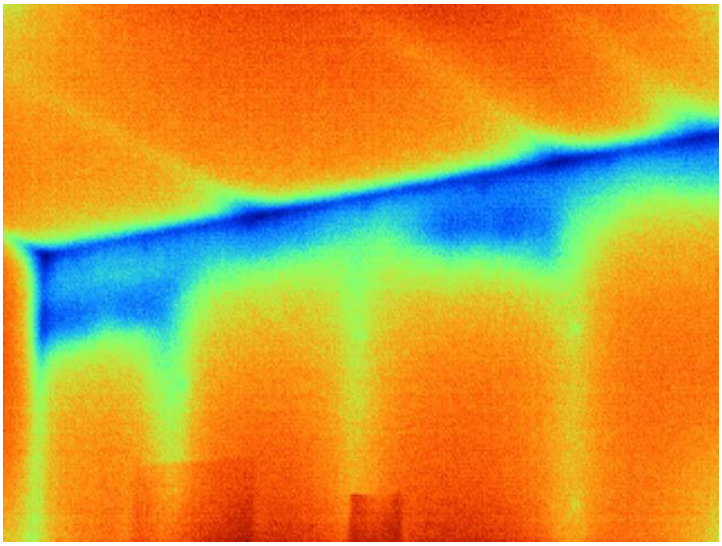


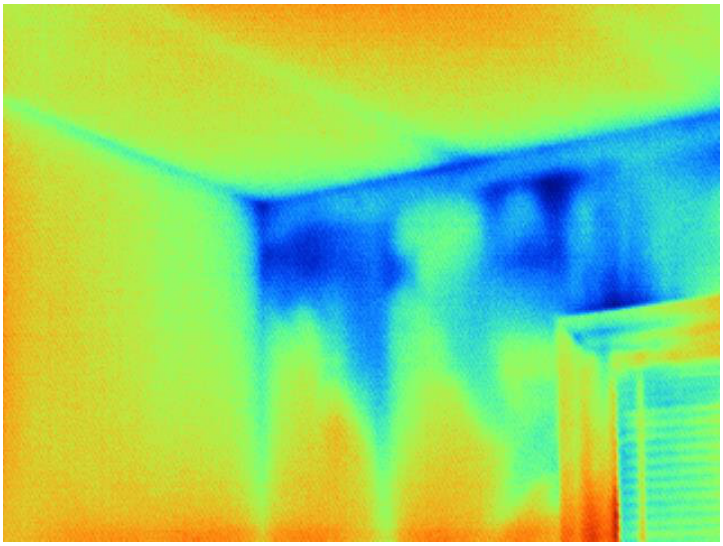


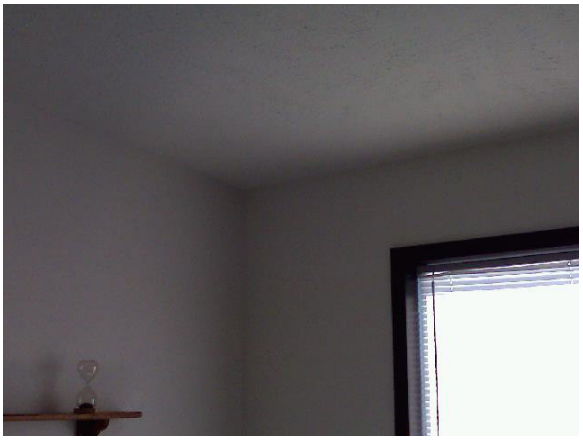
In the image above, wall and ceiling framing is visible in IR. Stick framed construction has a wooden member every 16 inches. Wood is not as good an insulator as the fiberglass in the cavities so these members appear cooler than the wall cavities. This is known as thermal bridging. The framing members provide a bridge to the outside for heat to escape. Corners are very cold because there is so much wood there. This is a drawback of framed construction.

Further, large cold areas appear at the corner near the ceiling and in the wall to the right of the TV. This is missing or improperly installed insulation. The fiberglass batts might have been compressed during installation at the factory. The void caused by such compression leaves space in the wall cavity for cold air to accumulate.

The image below is another example. I believe the batts were cut too short to extend all the way to the top of the cavity. Unfortunately, this is fairly standard for insulation in stick-framed construction. It is labor intensive and workers value speed of installation over quality.

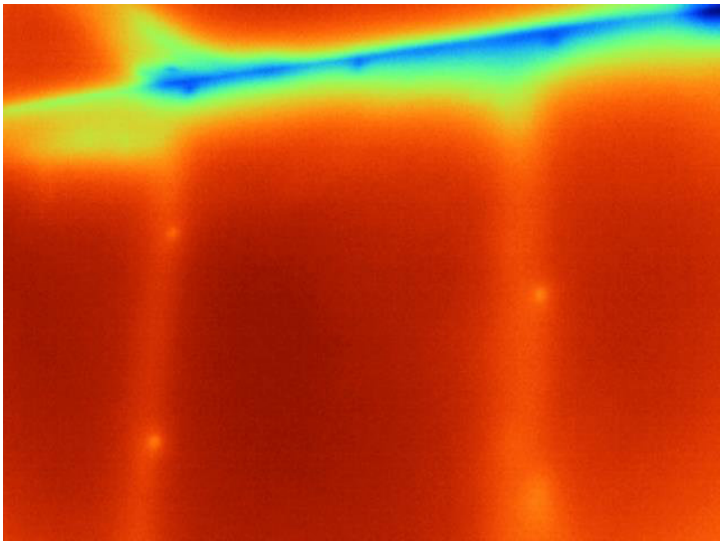






More examples of poor insulation installation in the stick-framed home. This deficiency is impossible to remedy without tearing the drywall off the wall.

The ICF walls in the Travers home do not show this deficiency. There is a stick-framed vestibule in that home – see the images below. Note that you can see the thermal bridging in that image as well as the cold corners we see in the images above. However, the insulation below is installed properly. There are no gaps or voids in the cavities. The wall cavities are warm all the way up to the ceiling.



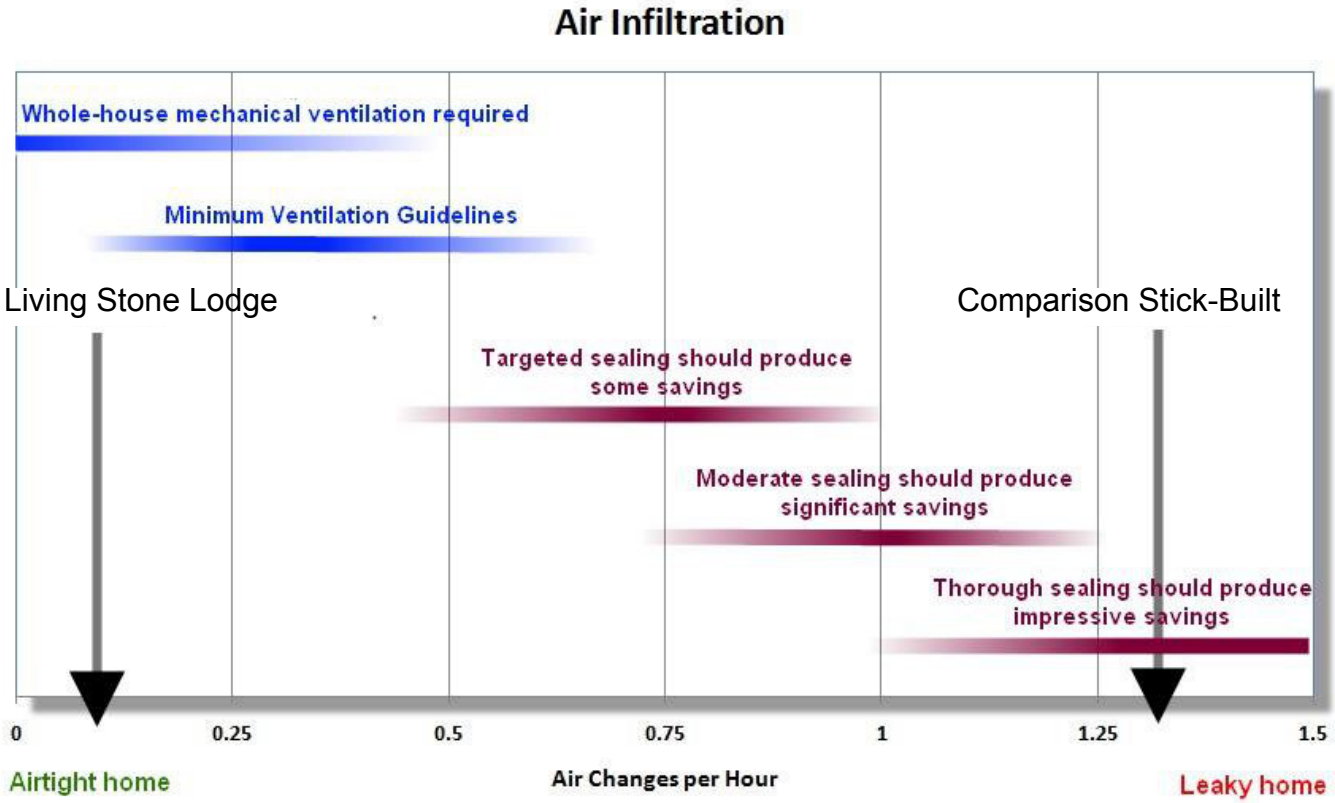
Infiltration

Infiltration is the movement of unconditioned air into the conditioned space. If outside air comes into a home, heated air is leaving as well. The building's tightness and resistance to infiltration is measured in air changes per hour (ACH); the number of times the home's air is replaced from outside in an hour.

The Blower Door test reveals another huge advantage of the ICF/SIP construction over stick-built. ICF/SIP construction is extremely tight. Stick-framing is very leaky. The ICF/SIP home had a calculated infiltration rate of 0.1 Air Changes per Hour (0.1 ACH). One-tenth of an air change per hour means the home's air would take 10 hours to completely leak out and be replaced with outside air.

The stick-built home's infiltration rate is 1.3 ACH. This means that the entire home's volume of air leaks out in less than an hour. The furnace would work hard to keep that incoming air warm. There was a window that would not latch which contributed to the high infiltration number. Also, a fireplace with a broken damper adds to the high number. Fireplaces are energy wasters. They should not be included in an efficient home design.

The ICF/SIP home is on the left, stick-built on the right. These homes are on opposite sides of the infiltration scale.



Conclusion

In terms of energy efficiency, there is no contest. The ICF/SIP home beats out the stick-framed home hands down. The home is tight and extremely well insulated. In a decade of energy audits, this is the tightest home I have encountered. Additionally, it is very well built, quiet, and strong to the point of being earthquake resistant.

It may be slightly more expensive to build. However, the energy efficiency of this home will offset any cost premium in relatively short order. It will also be much more comfortable for the occupants. It is difficult to put a price tag on comfort.

1855 Thomas Drive
Larimore, ND 58251
701-330-6680
henry@HomeEnergyScience.com

Home Energy Science is an ENERGY STAR partner

DMA ENGINEERING
Efficient Systems for Buildings

DATE: July 16, 2019

TO: MHA Nation, South Segment Twin Buttes-Living Stone Lodge

FROM: Steven Forrester, P.E. CGD BEMP LEED AP BD+C

RE: Twin Buttes - Stone Lodge

Project Description:

MHA Nation, South Segment Twin Buttes-Living Stone Lodge (client) would like to engage DMA Engineering (consultant) to design and commission an energy monitoring system for a single family residence located in North Dakota. The purpose of the monitoring is to verify the energy loss of the building as a measurement and verification of the home. Loads of the building are to be performed before construction to determine the energy consumption and inside air temperatures. The verification is to be used for financing of future residences and marketing of the home's energy consumption. The system is to gather data every fifteen minutes and store data for up to two years. The system is to have a dashboard that displays the temperatures, gas and electrical consumption in real time, monthly and rolling twelve month consumption.

Our proposal and fees are based upon the proposed architectural drawings, client's stated project goals, requirements for design and commissioning the monitoring system including producing the dashboards.

• 8120 Sheridan Blvd. Suite C100 Westminster, CO 80003 • 303-732-5559 • info@dma-eng.com

Services Provided:

Monitoring system to measure the following:

Direct Measurement					
	Temperature	Humidity	Voltage	Amp	Notes
Outside Air	1	1			
Horizontial Slab	5				Every 1' for 4' along the slab, one in the center of the slab
Vertical Foundation	4				Every 1' for 4' along the interior of sl
Earth	4				Every 1' for 4' along the backfill
Indoor Air	1	1			
Interior Wall Sill Plate interior	1				
Interior Wall Top Plate interior	1				
Interior Ceiling	1				
North Glazing Interior and Exterior	2				
South Glazing Interior and Exterior	2				
Sky Light Interior and Exterior	2				
Boiler Supply	2				
Boiler Return	2				
Gas Valve				4-20ma	
Total	28	2	0	1	

eGauge System	
Name	# of Measurements
Boiler	1
Boiler Primary Pump	1
Boiler Secondary Pump	1
Air Conditoner	1
Main Panel	1
Dryer	1
Range	1
HRV	1
Total	8

- Provide all hardware for the system including but not limited to:
    - Temperature probes
    - Data Acquisition system
    - eGauge electrical monitoring system
    - Current transducers
    - Gas transducer
    - NEMA 1R control panel
    - Wire
- Point to Point to wiring diagram of how to terminate the system and locations install the probes.
- Energy model of the building determining the predicated energy consumption and the interior space temperatures.
- Development of Dashboard showing the real time energy consumption, monthly, and yearly energy consumption
- Onsite system startup and commissioning
- Two years support worth of support.

Assumptions:

* Complete set of Architectural drawings will be supplied in AutoCAD 2010 or REVIT 2017 format.
* Onsite wiring performed by others.
* Monitoring system will have access to the internet.

System Checksums

By Prairie Engineering

Hydronic Heating Split Cooling — **Single Zone**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 7 / 15
Outside Air: OADB/WB/HR: 94 / 70 / 78

	Space Sens. + Lat. Btu/h	Plenum Sens. + Lat Btu/h	Net Total Btu/h	Percent Of Total (%)
Envelope Loads				
Skylite Solar	0	0	0	0
Skylite Cond	0	0	0	0
Roof Cond	330	0	330	1
Glass Solar	3,019	0	3,019	11
Glass/Door Cond	644	0	644	2
Wall Cond	1,381	0	1,381	5
Partition/Door	0		0	0
Floor	-395		-395	-1
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	4,979	0	4,979	18
Internal Loads				
Lights	6,757	1,967	8,724	31
People	4,650	0	4,650	17
Misc	2,389	0	2,389	9
Sub Total ==>	13,796	1,967	15,763	57
Ceiling Load	0	0	0	0
Ventilation Load	0	0	7,159	26
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-406	-406	-1
Sup. Fan Heat			373	1
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	18,775	1,561	27,869	100.00

CLG SPACE PEAK

Mo/Hr: Sum of
OADB: Peaks

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	637	3
Glass Solar	5,381	29
Glass/Door Cond	144	1
Wall Cond	692	4
Partition/Door	0	0
Floor	-395	-2
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	6,459	35
Internal Loads		
Lights	6,757	37
People	2,735	15
Misc	2,389	13
Sub Total ==>	11,881	65
Ceiling Load	0	0
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	18,339	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: -30

	Space Peak Space Sens Btu/h	Coil Peak Tot Sens Btu/h	Percent Of Total (%)
Envelope Loads			
Skylite Solar	0	0	0.00
Skylite Cond	0	0	0.00
Roof Cond	-1,556	-1,556	3.14
Glass Solar	0	0	0.00
Glass/Door Cond	-3,570	-3,570	7.21
Wall Cond	-4,892	-4,892	9.88
Partition/Door	0	0	0.00
Floor	-10,563	-10,563	21.34
Adjacent Floor	0	0	0
Infiltration	-3,842	-3,842	7.76
Sub Total ==>	-24,422	-24,422	49.34
Internal Loads			
Lights	0	0	0.00
People	0	0	0.00
Misc	0	0	0.00
Sub Total ==>	0	0	0.00
Ceiling Load	0	0	0.00
Ventilation Load	0	-25,072	50.66
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-24,422	-49,495	100.00

TEMPERATURES

	Cooling	Heating
SADB	60.1	90.5
Ra Plenum	74.0	72.0
Return	75.5	72.0
Ret/OA	79.0	53.0
Fn MtrTD	0.0	0.0
Fn BldTD	0.1	0.0
Fn Frict	0.2	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	1,259	1,259
Terminal	1,259	1,259
Main Fan	1,259	1,259
Sec Fan	0	0
Nom Vent	235	235
AHU Vent	235	235
Infil	0	36
MinStop/Rh	0	0
Return	1,259	1,295
Exhaust	235	271
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	18.7	18.7
cfm/ft²	0.49	0.49
cfm/ton	542.05	
ft²/ton	1,100.59	
Btu/hr·ft²	10.90	-19.36
No. People	11	

COOLING COIL SELECTION

	Total Capacity ton	Total Capacity MBh	Sens Cap. MBh	Coil Airflow cfm	Enter DB/WB/HR °F	Enter DB/WB/HR °F	Enter DB/WB/HR gr/lb	Leave DB/WB/HR °F	Leave DB/WB/HR °F	Leave DB/WB/HR gr/lb
Main Clg	2.3	27.9	23.6	1,259	78.8	62.2	62.5	59.8	54.5	59.1
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Total	2.3	27.9								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	2,556		
Part	0		
Int Door	0		
ExFlr	420		
Roof	610	0	0
Wall	1,589	136	9
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-49.5	1,259	53.0	90.5
Aux Htg	0.0	0	0.0	0.0
Preheat	-9.0	1,259	53.0	59.8
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-49.5			

Living Stone Lodge Revised Energy Consumption data

-------- Original message --------
From: Randy Axvig <raxvig@prairieengineeringpc.com>
Date: 10/3/19 4:18 PM (GMT-06:00)
To: Geordan Traver <traver.lsl@gmail.com>
Cc: Eric Miller <emiller@prairieengineeringpc.com>
Subject: Living Stone Lodge Revised Energy Consumption data

Good afternoon Geordan,

I went through my Living Stone Lodge model and updated the ventilation rate, lighting values and the other schedules as we discussed this afternoon.

Revised figures based on model revisions made today are as follows.

Energy Consumption

Building - 20,187 Btu/(ft2-year)
Source - 43,011 Btu/(ft2-year)

Environmental Impact Analysis (EIA)

CO2 - 18,664 lbm/year
SO2 - 73 gm/year
NOX - 38 gm/year

Please review these figures and let me know if you have any questions or need any other data.

Thank you and have a good day,

Randy J. Axvig, P.E., LEED AP

Prairie Engineering, P.C.
619 Riverwood Drive I Bismarck, North Dakota 58504
T. (701) 258-3493 I **C.** (701) 400-7363

SUPPORT LETTERS

Jiran Architects & Planners, PC

1431 Interstate Loop
Bismarck, ND 58502
(701) 258-7771
(701) 258-1672 Fax
e-mail: jeff@jiranpc.com

Twin Buttes-Living Stone Lodge
708 79 East Avenue N.W.
Halliday ND 58636
Phone # 701-938-4403
Fax # 701-938-4340

Attn: Geordan Traver
Project Specialist
701-421-0224

RE: Living Stone Lodge

Dear Geordan:

The project now known as the "Living Stone Lodge" has been a project that has been evolving between yourself and my firm for the last 13 years. Over the years, we have been developing, changing, and improving the basic concept of the "round" home and finally it looks like the idea is becoming a reality. Nobody knows better than you that the first prototype building located in Twin Buttes, ND is a superior structure for energy efficient living.

My firm is excited to be involved in taking this home concept to the next level by refining the design to make the home even more efficient not only regarding energy use but also in ease of construction and cost to build. This home design also seems to appeal greatly to Native American tribes due to the similarity to the cultural "earth lodge".

Affordable housing has been a goal of many designers and developers for decades. I believe that if our design team can refine the Living Stone Lodge idea into a net zero level of energy consumption and at the same time do it at a comparable cost to conventional construction, we will really have achieved something special. The basic structure can also be developed to be used for other types of occupancies as well. For this reason, I look forward to continuing with the development of this concept with you and the rest of the team.

Respectfully submitted,

JIRAN ARCHITECTS & PLANNERS, PC

Jeff Welch, A.I.A.
Owner & Principal Architect

7/24/2019

Corey Spotted Bear, Councilman

MHA Nation South Segment

Twin Buttes – Living Stone Lodge

708 79 East Ave. NW

Halliday, ND 58636

Councilman Spotted Bear;

This is a letter to voice my support of Living Stone Lodge project. I believe MHA Nation is most certainly pursuing leading edge technology and net zero applications within the confines of affordable housing.

I have been a General Contractor in Central North Dakota for 25 years and a teacher at a Tribal College for 2 ½ years. During my years of contracting I would use ICF in building foundations and complete buildings. I also had the opportunity to construct houses using SIP Panels. I am glad to see The Living Stone Lodge Project assimilate these efficient components.

As a teacher in the construction trades, I am always interested in showing my students new and innovative Ideas that can improve our methods of building. Living Stone Lodge shows the potential of revolutionizing how we might approach the huge challenge of providing well-built and energy efficient, healthy attractive homes. The desire of MHA to make building these homes as user friendly via a manual would open an opportunity for my students to embark on starting a business of building such homes.

Conversations with the Project Manager has allowed us to see a possibility of starting a small business on the reservation that could potentially build parts of this building (Mechanical room for example). Which could provide jobs and opportunities within our community.

In closing, I would like to reiterate that this is one of the best efforts I have seen in my years of contracting to address the monumental challenge of providing well -built affordable housing on our reservations nationwide.

Kim A. Paulson

General Contractor, Carpentry Instructor

4581 79th Ave NE

Devils Lake ND 58301

1000 East Calgary Ave. Suite 2
Bismarck, North Dakota 58503
Office | 701.221.3286
cwstructural.net

CWSTRUCTURAL
ENGINEERS

July 24, 2019

Corey Spotted Bear, Councilman
MHA Nation South Segment
Twin Buttes - Living Stone Lodge
708 79E Avenue NW
Halliday, ND 58636

RE: Living Stone Lodge – Net-Zero Commercialization Project Development

Dear Mr. Spotted Bear:

As you may know, our company has been involved with the Living Stone Lodge project for nearly three years. We highly support the proposed commercialization plan and its net-zero goals as we believe the building has a vast amount of potential to change the way people see and realize renewable energy. We also feel there is potential to further realize construction economies and efficiencies the advanced design and planning. It's been rewarding to provide research and design for the project and participate in its evolution from concept to prototype and now moving toward the broader commercialization market.

CW Structural is a progressive firm providing diverse Structural Engineering services for our clients working on hundreds of projects a year over many decades. We have worked for a wide variety of clients in all available construction materials and on all types of commercial, residential, institutional, recreational, governmental and other types of projects. Our vast Structural Engineering experience base has provided us with the knowledge and tools to bring a vast amount of options and alternatives to the table for the benefit of realizing the project's goals and objectives. We enjoy solving design challenges and appreciate being part of the Living Stone Lodge design team assisting the project management team. Our attention to detail, flexibility and broad project experience base and experience with the past development of the Living Stone Lodge project provides the background needed for us to help make the Living Stone Lodge net-zero, commercialization project successful.

We eagerly look forward to further development of renewable energy concepts in design of the building structure and shell that will have everlasting economic and environmental effects on the operation and functionality of the building. We also are eager to continue to develop the design and constructability of the building structure to further reduce the initial cost of fabrication and construction maximizing the economy of off-site fabrication and related offsite labor and minimizing the costs of onsite labor and related potential for errors during construction.

Again, we are completely supportive of the Living Stone Lodge project and believe wholeheartedly in the potential for further development of the commercialization project relative to the potential to capture more renewable energy toward realizing net-zero and in maximizing additional construction economies and efficiencies.

Sincerely,

Chris Wentz, P.E. - President
CWSTRUCTURAL Engineers

Cc: file

Prairie Engineering, P.C.
Professional Consulting Engineers

619 Riverwood Drive Suite 205
Bismarck, North Dakota 58504
Phone: (701) 258-3493

July 12, 2019

MHA Nation South Segment
Twin Buttes – Living Stone Lodge
708 79 E Avenue NW
Halliday, ND 58636

RE: Twin Buttes – Living Stone Lodge
Halliday, North Dakota

Dear Mr. Traver:

Prairie Engineering, P.C. is excited to be a part of the design team that has been assembled to design a 'Net Zero' Lodge. Our mechanical and electrical departments have extensive experience in energy efficient materials and systems. We have been involved in three different LEED certified Bureau of Indian Affairs projects and two Energy Star certified projects in Bismarck, North Dakota. The experience we have in the design and the performance achieved in the initial Living Stone Lodge has given us proven results on the building design.

As technology improves and equipment becomes more efficient, it has been standard practice for our firm to implement energy saving ideas that are affordable, reliable, easy to maintain and environmentally sound. It is our intention to apply these concepts to the proposed Living Stone Lodge project to achieve a 'Net Zero' Lodge and pave the way for design, construction, and operation of future high-performance buildings.

As a LEED Accredited Professional, I am enthused with your project and the challenges involved with designing a 'Net Zero' building and Prairie Engineering, P.C. looks forward to being a part of the team.

Sincerely,

Prairie Engineering, P.C.

Randy J. Axvig, P.E., LEED AP

RJA/wsa

cc: File

Home Energy Science

Henry Borysewicz
1855 Thomas Drive
Larimore, ND 58251
701-330-6680
www.HomeEnergyScience.com
e-mail: Henry@HomeEnergyScience.com

Twin Buttes-Living Stone Lodge
Attn: Geordan Traver, Project Specialist
708 79 East Avenue N.W.
Halliday ND 58636

RE: Living Stone Lodge

Dear Geordan,

I am excited to be involved in moving the Living Stone Lodge project to the next level. As you know, our first assessment of the first Living Stone Lodge prototype home provided eye-opening results. This home was the tightest residential construction I have seen in my 10-plus years of performing Energy Audits in North Dakota and northern Minnesota. When we compared this home to a typical manufactured home on the reservation, the differences were spectacular. The Living Stone Lodge outperformed the manufactured home impressively, in all categories. It is, without a doubt, the superior choice, especially in our harsh winter climate.

A well-planned construction project - including careful attention to energy efficiency - will pay dividends over the life of the building. An energy efficient home is not only less expensive to operate, it is more comfortable, durable, and maintains its resale value. Affordable, efficient homes like this benefit more than just the people who live in them. They help us avoid the expense of new power plants and transmission lines, thus helping to keep our energy costs from rising. They also benefit the planet by reducing the harmful pollution that such plants emit.

Energy efficiency is the cheapest, fastest, cleanest, and most reliable renewable energy resource. The cheapest and greenest energy is the energy you don't have to produce in the first place. A building's energy efficiency must be addressed first, before considering renewables such as photovoltaic or wind power generation. When looking at options for clean, low cost renewable energy, efficiency is generally the first and best choice. Once efficiency is addressed, we can consider renewable energy options.

I am excited to be involved with a project which has such a strong focus on energy efficiency and affordability. I look forward to working with you and the rest of the team as you continue the groundbreaking development of this work.

Best Regards,

Henry Borysewicz

ROCK INDUSTRIES
rockindustriescorp.com

9403 11th Avenue
PO Box 478
Fort Yates, ND 58538

P 701-854-4766
F 701-854-4770

7/11/19

Living Stone Lodge

Geordan Traver

To Whom It May Concern,

Good morning, we at Rock Industries Metal Fab and Welding, Fort Yates ND 58538 are extremely satisfied to work with Living Stone Lodge, Geordan Traver to provide welded wall support bracing and the central tension ring for the roof structure. We employ 3 welders here on site in Fort Yates and also travel to on-site locations to weld steel and aluminum materials. Geordan has been great to work with in providing the support for us to build the prototype as well as making sure that we have enough work in this cycle to be profitable. We look forward to continuing to make these parts for the homes and anything else that comes our way to support the construction of these awesome homes. The design, r factor and flow of the homes are extremely attractive to Native Home Buyers in that the circular design is akin to our cultural practices and beliefs.

Joseph McNeil, President

Standing Rock Development Corp, Rock Industries

9403 11th Ave

Fort Yates ND 59539

MANAGEMENT TEAM RESUMES

Resume

Geordan D. Traver
8132 7D Street NW
Halliday, N.D. 58636
701.421.0224
traver.LSL@gmail.com

Qualifications:

- 26 years of Project Management and Fabrication in Offshore and Industrial construction
- 9 years of Development and Fabrication of Marine and Industrial equipment
- 6 years of Direct Supervision relating to Offshore Construction and Management of support vessels
- 6 years in Management of Marine Fabrication Facility specializing in close tolerance machine work, state-of-the-art Plasma Cutting, Welding Technologies and Design
- 4 years Building Construction Management including 3.5 million dollar New School Addition Mandaree North Dakota
- 5 years Direct Sales and Consulting Agricultural Industry North Dakota

Professional Experience & Projects:

MHA Nation South Segment — 2019 to current
- Project Specialist Living Stone Lodge

Traver Industries Consultant — 2012 to 2019
- Concept Designer, development and manager of Living Stone Lodge
- General Contractor prototype Living Stone Lodge

RDO Equipment Co. — September 2009 to 2015
- Account Manager John Deere Agriculture
- Sales and Ag. Consulting Western North Dakota Farms

Builders Management and Investment Co. — January 2009 to June 2009
- General Manager Western Region
- Oversee rental properties in Western North Dakota
- Establish marketing and set price structure

Twin Buttes School — July 2008 to December 2008

- Project Manager for a 10.5 million dollar new school construction
- Provide bid specifications to retain Architects
- Liaison between Architects, Engineers, Contractors and School Board

Mandaree Public School — October 2004 to December 2007

- Project Manager for the construction of a New Addition to the Mandaree Public School
- New Addition square footage approximately 28,000 ft. Total construction cost $3.5 million US dollars
- Obtained funds and managed QZAB – Qualified Zone Academic Bond of $543,000.00.

Superior Diving LLC — October 2002 to 2004

- Consultant
- Developed and Managed start up of offshore and dockside Construction Company
- Develop design for deep diving chambers and negotiate price and quality control with fabrication shop
- Negotiated (over 4 million U.S. dollars for New Equipment purchase)
- Assisted in the development of Safety Policies

M I Drilling Fluids LLC — May 2002 to September 2002

- Consultant
- Develop special purpose vessel designed to collect and transport E&P drilling waste
- Complete engineering, design, and cost analysis for 10,000 barrel waste vessel

Specialty Companies, Inc. — March 1999 to 2002

- Consultant
- Develop Specialty Marine an offshore construction division of Specialty Companies. Managed all construction and accounting
- Develop solid waste destruction unit all research, fabrication, and testing of new technology, budget and cost control
- Provide services for repair and refit of 180’ x 40’ dive support vessel, including cost control, budget, shipyard representation and liaison with A.B.S., Vanautu, Coast Guard, Customs and Immigration, project estimated to be approximately 3.5 million dollars

Precision Welding and Mechanical Services — April 1992 to December 1998

- Owner/General Manager
- Provided engineering, technical assistance, drawings specification pre-operation for construction and marine repairs. Produced surveys including non-destructive testing, hull thickness, condition analysis, and all related services for dry docking and repair
- Managed full service machine and fabrication shop
- Designed and constructed water plant for the Hyatt Regency Hotel, high pressure system (partnered with DuPont Chemical)

The International Maritime Exchange, Inc. — January 1988 to March 1992

- Chief Executive Officer
- Provided technical support for marine related construction and remodel projects: fishing fleets, bulk carriers, oil service vessels, and barges
- Supervised shipyard modifications, refit, survey, and cost analysis
- Largest project eleven vessels at a total budget of 21 million U.S dollars US Bank located in Seattle, WA.

American Oilfield Divers — December 1982 to October 1987

- Offshore Operations & Marine Manager
- Developed five dive support vessels for active offshore oilfield Construction Company. Services included, locate, survey and purchase vessels to meet the requirement of offshore construction
- Design and cost control for renovations and refit including built in mechanical equipment, deck cranes, and dive gear and 4 point anchor systems
- Maintain quality control at ship yard and liaison for all regulatory agencies over these modifications
- Assembled management team and crew to operate vessels and completed a five year development plan which assisted in the corporate sale in excess of $230 million U.S. dollars

Education:

- Divers Institute of Technology: Deep Sea Diving
- World Vacuum Symposium: Professional Education
- Linn Benton College: Technology Coursework
- John Deere University online Ag related Coursework

CURRICULUM VITAE

Jessica C. White Plume, Ph.D., M.P.H.

MHA Nation South Segment
708 79E Ave. NW
Halliday, ND 58636
Phone : (701) 421-0420
E-mail : jwhiteplume@mhanation.com

Education

Doctoral Degree (Ph.D.)	University of North Dakota, Grand Forks, ND 58202 APA Approved Scientist-Practitioner Program Degree: Clinical Psychology Graduation: August 2006 Advisor: Nancy Vogeltanz-Holm, Ph.D. Focus: Health Psychology/Behavioral Health Dissertation: *Habituation to Repeated Visual or Verbal Worry Exposure and Subsequent Intrusive Thoughts and Images*
Masters Degree (M.P.H.)	University of Minnesota, Minneapolis, MN, 55454 Degree: Public Health Practice Graduation: August 2005 Advisor: Mary Story, Ph.D. Focus: Evaluation of Community Based Programs Thesis: *The Plain Truth: evaluation of strategies in a youth- targeted tobacco prevention media campaign*
Bachelors Degree (B.A.)	Black Hills State University, Spearfish, SD 57799 Degree: Psychology Graduation: May 1999 Summa Cum Laude

Areas of Interest

- Implementing, supporting, and evaluating health initiatives in rural native communities.
- Indigenous women's health.
- Optimizing community based research methodology, to effectively benefit all populations, including those in rural communities or those with disparate health needs.

Tribal Experience

June 2019 – Current
Indigenous Prenatal Care Specialist (consultant)
Support group prenatal care facilitators across 5 tribal communities. Collaborate with UND School of Medicine Native American Public Health Program, March of Dimes, and Rotary Club (Primary Grantee) to develop effective Women's Health Interventions.

June 2018-Current
Director – Wellness and Sustainability
Mandan Hidatsa Arikara Nation South Segment
Twin Buttes, ND
Duties: Develop and implement wellness and health promotion programs for rural native American community, including community wellness club, gardening programs, tribal buffalo project, honey bee program, horse culture programming. Supervision of department staff. Grant writing to support wellness programs.

Director – MHA Nation Horse Power Program (2009-2013)
MHA Nation, New Town, ND
Duties:

- Oversight of program delivery staff
- Development of community based horse culture program
- Community based participatory research methodology
- Interdepartmental collaborations within and across tribes

Principal Investigator – Bringing Back the Horses (Sunka Wakan Ah-ku) (2013-2015)
Duties:

- Otto Bremer Community Development Grant
- Developed Horse culture based intervention program for high risk native youth
- Supervised students and staff
- Worked collaboratively with Spirit Lake community leaders and youth

Grants, Scholarships, and Honors

2018 – PI - Shakopee Mdewakontan Sioux Community

$250,000 – Twin Buttes Community Center – Rural wellness and education development

2018 – PI - Intertribal Buffalo Council

$16,500 - Twin Buttes Herd Development Grant – Bison for community health and culturally based sustainability

2016 – 2018 – PI - USDA

$230,000 NHSC Special Emphasis Grant – Full Circle Nutrition – Garden to table program within Tribal College

2016 – 2018 – PI - First Nations Development Institute

$40,000 – NHSC – Seeds of Native Health – Full Circle Nutrition – Garden to table within a Tribal College

2015 – 2018 – PI - NIFA/USDA

$850,000 – NHSC Equity and Extension – Agricultural Services, Outreach, Education, and Research in Native Communities.

2010-2014 – PI – NIH NARCH – Evaluation of the effectiveness of a culturally-based equine assisted mental health program in Native American Adolescents.

2007-2009 – PI – Otto Bremer Foundation – Sunka Wakan Ah-ku – Preventing juvenile delinquency and recidivism utilizing horse culture.

2005-2009 – NIH/NHLBI - Consultant – Bright Start – Obesity Prevention in Native American Children

2004-2007 – HHS/HRSA – Clinical Researcher – Center Development for Center for Health Promotion and Prevention Research, UND School of Medicine and Health Sciences, Grand Forks, ND.

2002 Intercollegiate Academic Travel Grant, University of North Dakota

2002 EPSCOR Travel Grant, University of North Dakota

2002 Graduate School Travel Grant, University of North Dakota

1999 Psy Chi Induction, Black Hills State University

1999 Magna Cum Laude Graduation, Black Hills State University

1998 Psychology Scholarship, Black Hills State University

1998 Who's Who in American Colleges, Black Hills State University

1996 Clarkson Memorial Scholarship, Black Hills State University

1995 Red Cloud Scholarship, Carthage College

1995-1999 BHSU Dean's List of Academic Achievement

1995 Invited Commencement Speaker, Manderson, SD

1994 Invited Student Speaker, Greenwich, CT

Academic Experience

Sept 2018 – Current	Adjunct Professor
May 2015- May 2018	Director – Agriculture and Land Grant Department Nueta Hidatsa Sahnish College, New Town, ND Duties: Administer NIFA Equity and Extension grants in accordance with grant goals, primarily developing equine and gardening/ nutrition programs. Work collaboratively within college and community to achieve grant goals. Supervise supporting staff. Maintain reports to NIFA as well as academic administration within NHSC. Develop curricula and academic programs within Ag Division to increase enrollment and graduation of professionals within ag domains.
August 2013- May 2015	Director, Social Sciences Department Fort Berthold Community College, New Town, ND *Courses*: Developmental Psychology, Intro Psych and Soc, Statistics, Abnormal Psychology *Supervisor*: Dr. Waylon Baker *Duties*: Taught various social science classes, including development and presentation of class lectures as well as online courses. Maintained student grades and provided individual assistance to students as needed. Maintained department standards in assessment, development, and correspondence.
January 2001- May 2001	Graduate Teaching Assistant University of North Dakota, Grand Forks, ND *Course*: Developmental Psychology *Supervisor*: David Christian, Ph.D. *Duties*: Taught four weekly laboratory classes, including development and presentation of class lectures. Administered student examinations and weekly assignments, maintained student grades and provided individual assistance to students as needed.
August 1999- December 1999	Graduate Teaching Assistant University of North Dakota, Grand Forks, ND *Course*: Developmental Psychology *Supervisor*: Tom Petros, Ph.D. *Duties*: Taught four weekly laboratory classes, including development and presentation of class lectures. Developed, administered, and evaluated student examinations, weekly quizzes, and written assignments. Maintained student grades and provided individual assistance to students as needed.

Research Experience

Post-doctoral Fellow (August 2006 – 2009)
Center for Health Promotion and Prevention Research
University of North Dakota School of Medicine and Health Sciences
Director: Nancy Vogeltanz-Holm, Ph.D.
Duties include:

- Assist in writing of grants to support comprehensive tobacco use and obesity prevention programs in North Dakota communities.
- Collaborate with local, state, and tribal stakeholders in understanding and responding to community health needs.
- Coordinate on-site prevention program implementation, including outcome assessment and meeting with school, tribal, or agency representatives.
- Provide technical assistance for schools and other community agencies.
- Provide training seminars to medical residents and health professionals on empirically supported health behavior change strategies.
- Disseminate community based health data at local, tribal, state, and national levels via presentations and publications.
- Supervise Graduate Research Assistants.

Community Research Consultant (October 2006 – Present)
Project Bright Start - Obesity Prevention on the Pine Ridge and Rosebud Reservations
University of Minnesota Department of Epidemiology
Principle Investigator: Mary Story, Ph.D.
Duties: Develop culturally appropriate family enhancements for empirically based obesity prevention programs.

Grant Reviewer (April 2006 – June 2006)
Robert Wood Johnson Foundation
Healthy Eating Research Program – Round 1: School Food Policies and Environments
Scope of Projects: (1) Studies to identify or evaluate school food environment and policy changes with promise to improve healthy eating and reduce childhood obesity (awards up to $400,000). (2) Analyses of macro-level policy and system determinants of school food policy and environments (awards up to $75,000).

Researcher (September 2005 – August 2006)
UF Obesity Treatment Trials in Rural Communities
University of Florida, Gainesville, FL
Lead Researchers: David Janicke, Ph.D., Michael Perri, Ph.D.
Duties: Assist in the development and evaluation of empirically sound and culturally appropriate obesity treatment trial for children in rural Florida communities. Develop treatment manuals for participants and group leaders.

Graduate Research Associate (September 2001 – July 2005)
Center for Health Promotion and Prevention Research
University of North Dakota, Grand Forks, ND
Center Director: Nancy Vogeltanz-Holm, Ph.D.
Duties: Participate in development, implementation, and evaluation of evidence based tobacco and obesity prevention programs in North Dakota with particular emphasis on rural and Native American populations.

Graduate Researcher (September 1999 – 2001)
Department of Psychology
University of North Dakota, Grand Forks, ND
Lead Researcher: Nancy Vogeltanz-Holm, Ph.D.
Duties: Collaborated with team members for laboratory based research projects on
anxiety, stress, and alcohol related difficulties. My master's thesis and doctoral dissertation experimentally tested theory driven models of anxiety, in response to a specific stressor (thesis) and as manifested in Generalized Anxiety Disorder (dissertation). The causal roles of several important factors, including uncontrollability, previously experienced stressful life events, and trait factors, as well as the efficacy of a treatment analog were examined in a laboratory setting using both self-report and psychophysiological measures.

Clinical Experience

July 2009- June 2011 — Clinical Psychology Service Provider
MHA Nation Indian Health Service
New Town, ND
Provided assessments and treatment for rural native American population. Primarily focused on women's health, including mental health interventions, and health promotion.

July 2005 - July 2006 — Clinical Health Psychology Intern
University of Florida Shands Hospital
Gainesville, FL
Health Psychology Training Lead: Sam Sears, Ph.D.
Duties: Provide individual therapy to improve health behaviors (e.g. weight loss, tobacco cessation) or treat psychological disorders (e.g. depression). Conduct and report adult neuropsychological and child psychoeducational assessments. Conducted behavioral health risk evaluations and provided treatment for patients with chronic conditions who are candidates for surgeries (e.g. transplant, bariatric) and their caregivers. Report to multidisciplinary medical teams on patient's behavioral and

psychological appropriateness for surgery and post-operative health behavior adherence.

Oct. 2003 - May 2005

Health Psychology Trainee
Diabetes Clinic
Meritcare Health Systems Coordinated Treatment Center
Fargo, ND
Supervisor: Margo Adams-Larsen, Ph.D.
Duties: Provide pediatric psychology evaluation of child and adolescent patients with Diabetes Mellitus. Psychology consultation for interdisciplinary medical teams.

Oct. 2003 - May 2005

Health Psychology Trainee
Oral Cleft Palate Clinic
UND Speech and Hearing Clinic
Grand Forks, ND
Supervisor: Margo Adams-Larsen, Ph.D.
Duties: Provide pediatric psychology evaluation of child and adolescent medical patients with oral cleft palate conditions. Psychology consultation for interdisciplinary medical teams

Sept. 1999 - May 2004

Clinical Psychology Trainee
Psychological Services Center
University of North Dakota, Grand Forks, ND
Supervisors: Catherine Yeager, Ph.D., Amy Wenzel, Ph.D., Margo Adams-Larsen, Ph.D., Nancy Vogeltanz-Holm, Ph.D., John Tyler, Ph.D., ABPP
Duties: Provide assessment and behavioral therapy for children and adults presenting with mood, relationship, conduct, and educational difficulties. Focused training in empirically supported treatments including (a) treatment of eating disorders, (b) behavior modification, and (c) Dialectical Behavior Therapy.

August 2001- May 2002

Psychology Intern
Circle of Nations School
Wahpeton, ND
Supervisor: Doug McDonald, Ph.D.
Duties: Psychology consultation for teachers and administrators. Educational assessment. Individual and group therapy for children and adolescents in a residential school setting.

Sept. 2000 - June 2001

Clinical Psychology Intern
Grand Forks Human Nutrition Research Center
University of North Dakota, Grand Forks, ND
Supervisor: Jeffrey Holm, Ph.D.

Duties: Eligibility evaluation for trial participants with chronic medical conditions. Psychology outcome assessment. Individual and group therapy. Psychology consultation for interdisciplinary medical team.

Specialized Training

2019 — Master Gardener Certification
NDSU Extension
Fargo, ND

2011-2015 — Medicine Wheel Model of Horsemanship Certification
Trainers: Phillip Whiteman Jr and Lynette Two Bulls
Lame Deer, MT
Completed Level Four Certification for Medicine Wheel Model of Horsemanship for Equine Development as well as individual and community wellness interventions.

July 2010 — EAGALA (Equine Assisted Growth and Learning) Certification
Completed EAGALA professional certification as both a equine specialist and mental health provider.
Minneapolis, Minnesota

April 2004 — Motivational Interviewing
NDPA Clinical Workshop, Fargo, ND
Presenter: Carolina E. Yahne, Ph.D.,
Training: Reviewed empirical and theoretical bases for the transtheoretical stages of change paradigm and motivational interviewing. Applied motivational interviewing techniques via clinical roleplay. Delineated diverse applications of motivational interviewing principles and methods.

June 2003 — Assessment and Treatment of Tobacco Users: A Workshop For Specialists
University of North Dakota, Grand Forks, ND
Presenters: Thomas Paine, Ph.D., Karen Crews, D.M.D., Monica Sutton, M.S., The ACT (A Comprehensive Tobacco) Center at the University of Mississippi Medical Center
Training: Within a biopsychosocial model, didactic and interactive training included conceptualization, background, assessment, pharmacotherapy, and CBT for nicotine dependence.

November 2002 — Generalized Anxiety Disorder Theory Based Treatment
AABT World Rounds
Reno, NV

Demonstrator: T.D. Borkovec, Ph.D.
Training: Avoidance model of Generalized Anxiety Disorder and its clinical application were presented, with a focus on avoidance etiology.

November 2002 Cognitive Processing Therapy for PTSD and Associated Depression
AABT World Rounds
Reno, NV
Demonstrator: Patricia Resick, Ph.D.
Training: Review of PTSD intervention rationale and empirical support. Simulated therapy session demonstrated specific cognitive and behavioral exposure techniques.

Publications

White Plume, J. (2016). Four legged healers: Horse Culture as Medicine. *Tribal College Journal,* 27-4 Good Medicine Edition.

White Plume, J. (2016). Good Medicine Resource Guide. Tribal College Journal, 27-4 Good Medicine Edition.

Marrone, S., White Plume, J., Kerr, P., Pignol, A., Vogeltanz-Holm, N. D., Holm, J. E., & Adams Larsen, M. (2009). The role of free-play physical activity in healthy blood glucose maintenance in children with Type 1 Diabetes Mellitus. *Psychology, Health & Medicine. 14*, 48-52.

Vogeltanz-Holm, N., Holm, J. E., White Plume, J., & Poltavski, D. (2009). Confirmed recall and perceived effectiveness of tobacco countermarketing media in rural youth. *Prevention Science, 10,* 325-334.

Vogeltanz-Holm, N.D., Holm, J.E., White Plume, J., Listig-Lunde, L., Kerr, P., Poltavski, D., Diers, L., & Alfonso, P. (2008). Youth tobacco use prevention programs: Twenty-five years of research and recommendations for implementing successful school- and community-based programs. In M LaPointe (Ed.), *Adolescent Smoking and Health Research.* Hauppauge, NY: Nova Science Publishers.

Vogeltanz-Holm, N. D., Holm, J. E., & White Plume, J. (2004). The effectiveness of worksite
health promotion programs. *Health Care Discussions, 7*, 13-18.

Worksite Health Promotion Resources & Tools Development

Vogeltanz-Holm, N.D., Holm, J. E., Jollie-Trottier, T., & White Plume, J. (2007). *Worksite Tobacco Cessation Program Facilitator and Participant Manuals: Tobacco-Free Wellness.* UNDSMHS, Grand Forks, ND.

Community Research and Health Education Publications

Holm, J. E., Vogeltanz-Holm, N. D., Poltavski, D., Kerr, P., Marrone, S., & White Plume, J. (January 2007). *Burlington-Des Lac Elementary School Coordinated Approach to Child Health: Year two interim report, factsheet, and parental guide for promoting healthy lifestyles for children.* (Research Report No. 49). Grand Forks: University of North Dakota

Vogeltanz-Holm, N. D., Holm, J. E., Poltavski, D., Kerr, P., Marrone, S., & White Plume, J. (January 2007). *Ellendale Elementary School Coordinated Approach to Child Health: Year two interim report, factsheet, and parental guide for promoting healthy lifestyles for children.* (Research Report No. 48). Grand Forks: University of North Dakota.

Holm, J. E., Vogeltanz-Holm, N. D., Poltavski, D., Kerr, P., Marrone, S., & White Plume, J. (January 2007). *Grafton Century Elementary School Coordinated Approach to Child Health: Year two interim report, factsheet, and parental guide for promoting healthy lifestyles for children.* (Research Report No. 47). Grand Forks: University of North Dakota.

Vogeltanz-Holm, N. D., Holm, J. E., Poltavski, D., Kerr, P., Marrone, S., & White Plume, J. (January 2007). *Hettinger Elementary School Coordinated Approach to Child Health: Year two interim report, factsheet, and parental guide for promoting healthy lifestyles for children.* (Research Report No. 46). Grand Forks: University of North Dakota.

Holm, J. E., Vogeltanz-Holm, N. D., Poltavski, D., Kerr, P., Marrone, S., & White Plume, J. (January 2007). *Kenmare Elementary School Coordinated Approach to Child Health: Year two interim report, factsheet, and parental guide for promoting healthy lifestyles for children.* (Research Report No. 45). Grand Forks: University of North Dakota.

Vogeltanz-Holm, N. D., Holm, J. E., Poltavski, D., Kerr, P., Marrone, S., & White Plume, J. (January 2007). *Killdeer Elementary School Coordinated Approach to Child Health: Year two interim report, factsheet, and parental guide for promoting healthy lifestyles for children.* (Research Report No. 44). Grand Forks: University of North Dakota.

Holm, J. E., Vogeltanz-Holm, N. D., Poltavski, D., Kerr, P., Marrone, S., & White Plume, J. (January 2007). *Lisbon Elementary School Coordinated Approach to Child Health: Year two interim report, factsheet, and parental guide for promoting healthy lifestyles for children.* (Research Report No. 43). Grand Forks: University of North Dakota.

Vogeltanz-Holm, N. D., Holm, J. E., Poltavski, D., Kerr, P., Marrone, S., & White Plume, J. (January 2007). *Turtle Mountain Elementary School Coordinated Approach to Child Health: Year two interim report, factsheet, and parental guide for*

promoting healthy lifestyles for children. (Research Report No. 42). Grand Forks: University of North Dakota.

Holm, J. E., Vogeltanz-Holm, N. D., White Plume, J., Marrone, S., Goetz, M., & Poltavski, D. (January 2007). *Ojibwa School Interim Report 2006, Tobacco and Other Substance Use in Middle School Students: Life Skills Evaluation Project 2003-2007.* (Research Report No. 41). Grand Forks: University of North Dakota.

Vogeltanz-Holm, N. D., Holm, J. E., White Plume, J., Goetz, M., Marrone, S., & Poltavski, D. (January 2007). *Turtle Mountain Community Schools Interim Report 2006, Tobacco and Other Substance Use in Middle School Students: Life Skills Evaluation Project 2003-2007.* (Research Report No. 40). Grand Forks: University of North Dakota.

Holm, J. E., Vogeltanz-Holm, N. D., White Plume, J., Marrone, S., Goetz, M., & Poltavski, D. (January 2007). *White Shield School Interim Report 2006, Tobacco and Other Substance Use in Middle School Students: Life Skills Evaluation Project 2003-2007.* (Research Report No. 39). Grand Forks: University of North Dakota.

Vogeltanz-Holm, N. D., Holm, J. E., White Plume, J., Goetz, M., Marrone, S., & Poltavski, D. (January 2007). *Minot School District Interim Report 2006, Tobacco and Other Substance Use in Middle School Students: Life Skills Evaluation Project 2003-2007.* (Research Report No. 38). Grand Forks: University of North Dakota.

Holm, J. E., Vogeltanz-Holm, N. D., White Plume, J., Marrone, S., Goetz, M., & Poltavski, D. (January 2007). *Dunseith Public School Interim Report 2006, Tobacco and Other Substance Use in Middle School Students: Life Skills Evaluation Project 2003-2007.* (Research Report No. 37). Grand Forks: University of North Dakota.

Vogeltanz-Holm, N. D., Holm, J. E., White Plume, J., Goetz, M., Marrone, S., & Poltavski, D. (January 2007). *Dunseith Day School Interim Report 2006, Tobacco and Other Substance Use in Middle School Students: Life Skills Evaluation Project 2003-2007.* (Research Report No. 36). Grand Forks: University of North Dakota.

Vogeltanz-Holm, N. D., Holm, J. E., White Plume, J., Goetz, M., Marrone, S., & Poltavski, D. (January 2007). *Lisbon Public School Interim Report 2006, Tobacco and Other Substance Use in Middle School Students: Life Skills Evaluation Project 2003-2007.* (Research Report No. 35). Grand Forks: University of North Dakota.

Selected Professional Presentations (2012-2003)

Vogeltanz-Holm, N. D., Holm, J. E., White Plume, J., Benda, B., Poltavski, D., & Jónsdóttir, H. (October 2012). *Positive influences and barriers for fruits and vegetables consumption in employees and their spouses: Qualitative and*

quantitative results. Paper presented at the annual meeting of the American Public Health Association, San Francisco, CA.

Goetz, M., Holm, J. E., Vogeltanz-Holm, N. D., White Plume, J., & Peterson, L. (November 2007). *Emotional and evaluative responses to antismoking media in college students.* Paper presented at annual meeting of the National Conference on Tobacco or Health, Minneapolis, MN.

Marrone, S. A., White Plume, J., Kerr, P., Evans, A., Vogeltanz-Holm, N., Holm, J., & Adams Larsen, M. (April 2006). *Examining type 1 diabetes onset and blood glucose levels in children: the effects of waist-to-height ratio, breastfeeding, and exercise*. Paper presented at the annual meeting of the National Conference on Child Health Psychology, Gainsville, FL.

Holm, J.E., Vogeltanz-Holm, N. D., Marrone, S., Yoder Alfonso, P., White Plume, J., & Evans, A. (May 2005). *Knowledge and attitudes about cigarette smoking in elementary-school children.* Paper presented at the 2005 National Conference on Tobacco or Health, Chicago, IL.

Vogeltanz-Holm, N.D., Holm, J.E., White Plume, J., Poltavski, D., Prom, J., & Yoder Alfonso, P. (May 2005). *Evaluating youth receptivity of different anti-tobacco messages.* Paper presented at the 2005 National Conference on Tobacco or Health, Chicago, IL.

Vogeltanz-Holm, N.D., White Plume, J., Holm, J.E., Poltavski, D., & Prom, J. (May 2005). *Native American and rural youth receptivity to an anti-tobacco media campaign: Results from the "Plain Truth."* Paper presented at annual Rural Minority & Multicultural Health Conference, New Orleans, LA.

Holm, J.E., Vogeltanz-Holm, N.D., Marrone, S., Yoder Alfonso, P., White Plume, J., Poltavski, D., Prom, J., Evans, A., Diers, L., & Kerr, P. (March 2005). Implementing community and school-centered obesity prevention programs in North Dakota. In N.D. Vogeltanz-Holm & J.E. Holm (Chairs). *Preventing obesity in North Dakota: Comprehensive approaches in community settings.* Symposium presented at the annual Dakota Conference on Rural and Public Health, Bismarck, ND.

Poltavski, D., Holm, J.E., Vogeltanz-Holm, N.D., McDonald, L.R., Kerr, P., McDonald, F., & White Plume, J. (March 2005). The obesity epidemic in North Dakota: Examining behavioral risk factors and subpopulation disparities. In N.D. Vogeltanz-Holm & J.E. Holm (Chairs). *Preventing obesity in North Dakota: Comprehensive approaches in community settings.* Symposium presented at the annual Dakota Conference on Rural and Public Health, Bismarck, ND.

White Plume, J., Vogeltanz-Holm, N., Holm, J.E., & Deloy, J. (July 2004). *Exposure to repeated visual or verbal worry and subsequent intrusive thoughts and images*. Paper presented at the annual meeting of the American Psychological Association, Honolulu, HI.

Evans, A., White Plume, J., Vogeltanz-Holm, N. D., & Holm, J. E. (April 2003). *Tobacco cessation interventions: What works best?* Paper presented at the annual meeting of the North Dakota Psychological Association, Fargo, ND.

Holm, J. E., Vogeltanz-Holm, N. D., & White Plume, J. (February 2003). *Reducing tobacco use in North Dakota youth: evidence for using school-based curricula and media*. Paper presented to the annual meeting of the Dakota Conference on Rural and Public Health, Bismarck, ND.

Holm, J.E. Vogeltanz-Holm, N.D., **White Plume, J.,** Listug-Lunde, L., Evans, A., Alfonso, P.Y., & Diers, L. (in press). *Preventing Tobacco Use in North Dakota Youth: Using Evidence From School-Based and Comprehensive Prevention and Control Programs for Effective Application in North Dakota*. (Research Monograph No. 1). Grand Forks: University of North Dakota Press.

Vogeltanz-Holm, N.D., **White Plume, J.,** & Holm, J.E. (2004). *Improving employee health through worksite wellness programs: A technical report to the North Dakota Public Retirement System.* University of North Dakota: Grand Forks, ND.

Vogeltanz-Holm, N., Holm, J.E., **White Plume, J.** (2004). The effectiveness of worksite health promotion programs. *Health Care Discussions, 7(3),* 13-18.

Sallinen, B., Janicke, D., **White Plume, J.** Creating a positive family environment for healthy lifestyles and weight change: a focus on families from rural communities. *Florida Psychologist* (accepted for publication).

Janicke, D., Sallinen, B., **White Plume, J.** Prevention Programs: School Aged Children and Adolescents. In Jelalian, E. & Steele, R.G. (Eds.) *Handbook of Child and Adolescent Obesity*. Springer Publishers (accepted for publication).

Vogeltanz-Holm, N., Holm, J., Poltavski, D., & **White Plume, J.** (2004). *Reach* and *receptivity of anti-smoking television and radio advertisement messages in North Dakota youth*. Manuscript under review.

Invited Talks

White Plume, J. (October 2004). *Adapting to Illness and Promoting Health in Children and Families.* North Dakota Department of Human Services – Children's Special Health Services Training, Bismark, ND.

White Plume, J. (March 2003). *Primary Prevention of Problematic Behavior: Another Level of Psychological Intervention.* Research Colloquium. Department of Psychology at the University of North Dakota, Grand Forks, ND.

White Plume, J. (October 2003). *Issues in Marital Therapy: A Case Presentation.* Research Colloquium. Department of Psychology at the University of North Dakota, Grand Forks, ND.

Presentations

Vogeltanz-Holm, N.D., Holm, J.E., **White Plume, J.**, Poltavski, D., & Prom, J. (May 2005). *Evaluating youth receptivity of different anti-tobacco messages.* Presented at the annual National Conference on Tobacco or Health, Chicago, IL.

Poltavski, D., Holm, J.E., Vogeltanz-Holm, N.D., McDonald, L.R., Kerr, P., McDonald, F., **White Plume, J.** (March, 2005). The obesity epidemic in North Dakota: Examining behavioral risk factors and subpopulation disparities. In N.D. Vogeltanz-Holm & J.E. Holm (Chairs). *Preventing obesity in North Dakota: Comprehensive approaches in community settings.* Presented at the annual Dakota Conference on Rural and Public Health, Bismark, ND.

Holm, J.E., Vogeltanz-Holm, N.D., Marrone, S., Yoder Alfonso, P., **White Plume, J.,** Poltavski, D., Prom, J., Evans, A., Diers, L., & Kerr, P. (March 2005). Implementing community ans school-centered obesity programs in North Dakota. In N.D. Vogeltanz-Holm & J.E. Holm (Chairs). *Preventing obesity in North Dakota: Comprehensive approaches in community settings.* Presented at the annual Dakota Conference on Rural and Public Health, Bismark, ND.

Holm, J.E., Vogeltanz-Holm, N.D., Marrone, S., Yoder Alfonso, P., **White Plume, J.,** & Evans, A. (May 2005). *Knowledge and attitudes about cigarette smoking in elementary school children.* Presented at the National Conference on Tobacco or Health, Chicago, IL.

Vogeltanz-Holm, N.D., Holm, J.E., **White Plume, J**., Poltavski, D., & Prom, J. (May 2005). *Native American and rural youth receptivity to an anti-tobacco media campaign: results from the Plain Truth.* Presented at the annual Rural Minority and Multicultural Health Conference, New Orleans, LA.

Olson, E., **White Plume, J.**, & Adams-Larsen, M. (October 2004). *Reduction of tobacco intake through behavior modification programming.* Presented at the annual meeting of the North Dakota Psychological Association, Fargo, ND.

Marrone, S. **White Plume, J.,** Kerr, P., & Evans, A. (October 2004). *Biometric, behavioral, and historical factors related to blood glucose management in children attending diabetes camp*. Presented at the annual meeting of the North Dakota Psychological Association, Fargo, ND.

White Plume, J., Vogeltanz-Holm, N., Holm, J., Deloy, J. (July 2004). *Repeated visual or verbal worry exposure and subsequent intrusive thoughts and images*.

Presented at the annual meeting of the American Psychological Association, Honolulu, HI.

Deloy, J., Vogeltanz-Holm, N., Holm, J., **White Plume, J.** (July 2004). *The effects of private or public evaluation of procrastination in a laboratory setting.* Presented at the annual meeting of the American Psychological Association, Honolulu, HI.

Evans, A., **White Plume, J.,** Vogeltanz-Holm, N. D., & Holm, J. E. (April 2003). *Tobacco cessation interventions: What works best?* Paper presented at the annual meeting of the North Dakota Psychological Association, Fargo, North Dakota.

White Plume, J., Prom, J., Evans, A., & Vogeltanz-Holm, N. (February 2003). *Obesity in North Dakota youth: prevalence, characteristics, and evidence-based intervention strategies*. Presented at the annual meeting of the Dakota Conference on Rural and Public Health, Bismark, ND.

Prom, J., Vogeltanz-Holm, N., **White Plume, J.,** & Evans, A. (February 2003). *Building collaborative relationships for establishing a comprehensive tobacco prevention plan in North Dakota*. Presented at the annual meeting of the Dakota Conference on Rural and Public Health, Bismark, ND.

Holm, J.E., Vogeltanz-Holm, N., **White Plume, J.** (February 2003). *Reducing tobacco use in North Dakota youth: evidence for using school-based curricula and media*. Presented at the annual meeting of the Dakota Conference on Rural and Public Health, Bismark, ND.

Vogeltanz-Holm, N., Prom, J., **White Plume, J.,** & Evans, A. (November 2002). *Tobacco prevention in the Ft. Berthold reservation schools.* Presented at the White Shield School District, White Shield, ND.

Vogeltanz-Holm, N. & **White Plume, J.** (September 2002). *Tobacco prevention in New Town schools*. Presented at the New Town School District, New Town, ND.

Deloy, J., Vogeltanz-Holm, N., **White Plume, J**., Manock, M., Clausen, J., & Aird, R. (2003). *Normative data on procrastination in college students*. Presented at the annual meeting of the North Dakota Psychological Association. Fargo, ND.

White Plume, J., Vogeltanz-Holm, N., Deloy, J., Schlinger, T., & Deitz, J. (2003). *Symptoms of Generalized Anxiety Disorder in a student population.* Presented at the annual meeting of the North Dakota Psychological Association. Fargo, ND.

White Plume, J., Deloy, J., Drach, R., Macho, M. & Vogeltanz-Holm (2002). *Stressful life events and controllability as predictors of subjective and psychophysiological responses to a laboratory stressor*. Presented at the 36th Annual Meeting of the Association for Advancement of Behavior Therapy, Reno, NV.

Deloy, J., **White Plume, J.,** Drach, R., & Vogeltanz-Holm, N. (2001). *The effects of perceived controllability of previous life stressors on subjective ratings of stressor severity.* Presented at the annual meeting of the North Dakota Psychological Association, Fargo, ND.

References

Sierra Spotted Bear, B.S.
NHSC Twin Buttes Mentor Site Coordinator
Halliday ND, 58636
701-421-1342
sabe@nhsc.edu

Twyla Baker, Ph.D.
President – Nueta Hidatsa Sahnish College
New Town, ND 58763
(701) 421-3036
tbaker@nhsc.edu

Lori Nelson, M.S.
Director – Pre-Engineering and Agriculture Programs
Nueta Hidatsa Sahnish College
New Town, ND 58763
701-789-1681
lalfson@nhsc.edu

Consulting – Honor the Earth – 2018
Commencement speaker NHSC 2018
Honoring Mother Earth Sustainability Conference May 2019
Shakopee Mental health Department 2017
Cheyenne River Horsemanship Program – 2016
2019 expo

Firm Overview – Jiran Architects

Jiran Architects was founded in 1976 by Mr. Don Jiran. In the 43 years since, Jiran Architects has emerged as a leader in healthcare and educational design in Western North Dakota. Our firm has also designed a wide variety of other types of building as well from banks, office buildings, transportation facilities, public housing, and athletic facilities.

In 2004, Jiran Architects was bought by Mr. Jeff Welch, an employee of the firm with 32 years of experience with Jiran Architects. Currently, Jiran Architects continues to succeed and is expanding it's business with projects with the MHA Nation in New Town, ND as well as the Turtle Mountain Band of Chippewa Indians in Belcourt, ND. Our firm averages $20M - $30M of construction projects per year.

Although our firm is a small, 5 person firm, we have always maintained a reputation for excellence in design and client relations. Jiran Architects only hires Architects and Architectural graduates, no draftsmen. The reason for this is that we believe that it is important to the client that only qualified individuals trained in design should work on a project from start to finish. All the Architects in our firm are registered Architects.

The most important goal we have with every project is to work in the best interest of the Owner and serve as their agent throughout the design and construction of a building

Jeff Welch, AIA

JEFF WELCH, A.I.A. OWNER & PRINCIPAL ARCHITECT

JIRAN ARCHITECTS & PLANNERS, P.C.

EDUCATION

- North Dakota State University
  Bachelor of Architecture, 1987
  B.S. in Environmental Design, 1987

REGISTRATION

North Dakota 1996 – Architecture
Montana 2005 – Architecture
South Dakota 2012 – Architecture
Wyoming 2014 – Architecture

AFFILIATIONS

- North Dakota State American Institute of Architects
- National American Institute of Architects
- National Council Architectural Registration Board
- Cathedral of the Holy Spirit Church Counsel (2003-06)
- Bismarck – Mandan Development Association Board of Directors.
- Lean Six Sigma certified – Villanova University 2014

EXPERIENCE

- Mr. Welch joined Jiran Architects in 1987
- Owner and Principal Architect since 2004
- Project Architect for St. Alexius Medical Center
- Specification writer and estimator
- Project Architect for Turtle Mountain Community College Campus – Multiple Projects.
- Project Architect for Twin Buttes Community Center, Twin Buttes Motel, & Twin Buttes Rodeo & equestrian Facility
- Project Architect for MHA Nation Veteran's Affairs Facility in New Town, ND
- Project Architect for Sitting Bull College – All Projects
- Project Architect for Mid Dakota Clinic additions
- Project Architect for St. Mary's Central High School
- Project Architect for Horizon Middle School, Century High School, Williston Middle School.

1000 East Calgary Ave. Suite 2
Bismarck, North Dakota 58503
Office | 701.221.3286
CWSTRUCTURAL.NET

CWSTRUCTURAL Engineers has a history of superior structural engineering in the upper Midwest region dating back over 45 years. Our continued dedication to exceptional service and quality has resulted in successful projects of all building types. We offer a diversity of full service Structural Engineering services to solve many types of design objectives. Chris Wentz, P.E. - President, is professionally registered in six states including North Dakota, Idaho, Iowa, Montana, Minnesota, South Dakota, Texas, Wisconsin and Wyoming.

Our company currently successfully manages and completes well over 350 projects a year at an average annual construction dollar value of over $320 Million. We have successfully completed municipal, religious, educational, industrial, recreational, healthcare, governmental and commercial projects of all types and sizes utilizing many different construction materials and practices. Projects range from simple observation reports to complex $55 Million facilities. Recently completed building projects include the $110 Million Watford City Events Center, $57 Million Watford City High School, $43 Million Minot Public Schools Additions and Renovations, $89 Million Bismarck Public Schools New Elementary and High Schools, $8 Million Shiloh Christian School, $53 Million ND State Penitentiary Expansion, $23 Million Bismarck Civic Center Exhibit Hall Expansion, $30 Million Dickinson Waste Water Treatment Facility, $7.5 Million Bismarck State College Student Union Addition and $16 Million Bismarck Public Schools Technology Center.

We have also been involved in a large number of government contracts as a consultant. Agencies that we have worked with include the North Dakota Army and Air National Guard, U.S. Air Force, U.S. Forest Service and Veterans Administration. We are very familiar with submittal requirements, standards and time schedules which accompany these types of projects.

We are a strong progressive firm both in design and professional character. Our staff consisting of 4 registered structural engineers, 2 drafting technicians, 1 engineering technicians and 1 clerical person is very efficient and dedicated resulting in a 100% completion success rate in meeting all design and production schedules while developing complete and accurate construction documents and specifications. We pride ourselves on an unparalleled commitment to service resulting in responsive engineering design and drafting with excellent coordination and accuracy in serving our clients as well as other consultants on their design team. We also pride ourselves on excellent documentation standards.

Through professional organizations, trades, collaboration with contractors and construction managers and industry suppliers we maintain awareness of new technological or industry developments and implement them when benefits will be realized to the project. We are members of various national organizations including the National Society of Professional Engineers, American Institute of Steel Construction, Prestressed Concrete Institute, American Concrete Institute and the American Institute of Timber Construction. Our engineers continually keep abreast of new developments through these organization’s manuals, correspondence and seminars.

We use state-of-the art software and processes to assist in operations, analysis and design. Accounting, and administrative software aid in keeping accurate and efficient records. Engineering design programs aid the engineers in designing efficiently and accurately. These include finite element analysis, design of steel, concrete, prestressed concrete and timber framework and structural components and connections. Computer aided drafting using Auto Cad and Revit accompanied by office procedures and drafting standards aid in efficiently developing complete and accurate Construction Documents. We feel our attention to detail and coordination in analysis, design and preparation of Constructions Documents is unparalled.

RESUME

B. Belinda Strotheide belinda@seedstockmedia.com

PO Box 132207 Tyler, Texas 75713 979-318-9158

communications

- Developed digital magazines, training videos, marketing and branding solutions for national and international clients.
- Developed promotional and support materials including press releases, brochures, web pages and Power Point/Keynote presentations for various projects.
- Developed and implemented social marketing and branding strategies for businesses and various entities.
- Promoted programs and projects to directors, staff, state and federal employees, board members and local community residents.

technology

- Developed and maintained databases and reporting for several entities.
- Developed curriculum and trained technology classes in MS Word, Access, Excel, Publisher and FrontPage web design.
- Provided QuickBooks account support and training for clients.
- Completed web design, UX, WordPress and online marketing courses.

projects

- Developed and administered budgets and programs up to $6 million for housing, medical, economic development and educational programs.
- Created policies and administrative procedures for a variety of organizations, several with annual budgets over $300 million.
- Developed business plans, marketing plans and sales strategies for small businesses.
- Directed start-up businesses, founded non-profit organizations and managed statewide projects.
- Accessed grant funding from foundations, state and federal sources totaling more than $20 million with a 90% success rate.
- Developed and implemented policies and procedures in compliance with state and federal regulations.

experience

Web Design & Business Development Consultant | 6 years - current

Web Designer/Copywriter/Managing partner | Seed Stock Media, LLC Tyler, TX
Responsible for all aspects of business from marketing and media promotion to operations and bookkeeping. Design and develop websites, provide copywriting and media projects to support local, national and international businesses and organizations. Provide marketing consulting and technical writing to clients.

Community Development & Grant Proposal Writer | 14 years

Grants/Project Coordinator | Minot State University Minot, ND
Great Plains Center for Community Research and Service

Developed grant proposals and successful RFP contract funding. Implemented statewide developer network & resource website. Coordinated with healthcare providers, federal and state agencies on collaborative project proposals. Created marketing materials and social media content. Published written works in support of projects. Produced and delivered both live and online presentations. Developed contracts in compliance with institutional regulations.

Grants Coordinator | St. Alexius Medical Center, Bismarck, ND
Researched grant opportunities and developed proposals and contracts. Created grant award reports and administrative documents. Coordinated all department interactions from compliance and procurement to clinics and physicians in support of grant project activities. Developed internal policies and procedures for federal and state regulation compliance.

Consultant/Owner | Apple Seed Enterprises Claremore, OK
Grant writer and project development consultant. Developed, promoted and administered programs, projects, budgets and grants and provided technical assistance to businesses, non-profit organizations, municipalities and schools. Developed marketing plans, materials and training for business and client projects.

Fund Development Director | Star of Hope Activity Center, Inc. Coos Bay, OR
Developed all fundraising activities, events, grant writing and volunteer recruitment and development. Initiated volunteer recruitment program and organizational process, created first annual event and accessed grant funding. Created marketing campaigns, purchased print ads and radio spots, developed marketing materials and website for organization and events.

Economic Development Director | Grant & Hettinger Counties' JDA
Developed strategies to bring resources to business start-ups, small and emerging businesses and community projects. Built business retention and expansion programs for six towns in a two-county region. Developed and implemented initiatives and training for agri-tourism businesses. Marketed the region for increased tourism activity. Initiated strategic planning for two cities.

education

Bachelor of Science
Major: Merchandising Management | Minor: Business Administration
Oregon State University Graduated Summa Cum Laude

Associate of Arts
Visual Arts concentration
Southwestern Oregon Community College

community

Membership

Member:	Whitehouse Chamber of Commerce
Member:	Texas Downtown Association
Member:	Palacios Chamber of Commerce
Member:	Sunrise Rotary Club
Member:	Southern Economic Development Council
Vice Chair:	Rural Economic Area Partnership Investment Board
Member:	Southwest Economic Developers Partners Network
Member:	Williston Teen Center Board
Treasurer:	Bay Area Together for Youth

references

Shirley Brentrup, Administrator
REAP Investment Board, Inc.
635 Oak Street Dickinson, ND 58601
701-483-1447 brentrup@ndsupernet.com

Paul Christiansen, President
Omega Productions
456 Commerce Street Palacios, TX 77465
214-675-9574 paul@omegalive.com

Sandra Catlett, CEO
Robert Turner Associates, Inc.
10939 Shady Trail #B-2 Dallas, TX 75220
214-351-4870 sandra@rtadallas.com

Home Energy Science

1855 Thomas Drive
Larimore, ND 58251

701-330-6680
henry@ HomeEnergyScience.com
www.HomeEnergyScience.com

Henry Borysewicz

EDUCATION

Thermal/Infrared Thermography, Buildings Specific, Level 1 The Snell Group, Barre, VT	2010
Green Building Certificate International Assoc. of Cert. Home Inspectors, Boulder, CO	2010
RESNET Certified Home Energy Rater Kansas Building Science Institute, Manhattan, KS	2009
Master of Science - Space Studies University of North Dakota, Grand Forks, ND	1996
Bachelor of Science - Electrical & Computer Engineering Carnegie Mellon University, Pittsburgh, PA	1994
Associate of Science - Computer Science Raritan Valley Community College, North Branch, NJ	1991

After obtaining his RESNET certification, Henry established Home Energy Science, a consulting business that provided Energy Audits, HERS Ratings, and other services to homeowners, Realtors, and the construction trades. Home Energy Science was established as an ENERGY STAR Partner and provided independent inspection, diagnostics, and verification which led to ENERGY STAR certification of newly constructed homes.

Since entering the field, Henry has taken a leading role in the local efficiency conversation. He was a member of the Energy Efficiency Partnership, a state-wide consortium comprised of utilities, city and state government, educational institutions, environmental advocacy groups, and private business interests. The Partnership promoted energy efficiency across the state of North Dakota. He was also a founding member of the Grand Forks Energy Alliance, a public/private association that sought to help homeowners lower their energy bills while positively impacting our environment.

BUDGET DETAIL

LIVING STONE LODGE BUDGET DETAIL

Renewable Energy Project Expense Description

Renewable Energy Design Expense: $ 160,696
Architects, Engineers and Renewable Energy Consultants will create a Renewable Energy Plan and design an electrification plan that includes a customized single-well residential ground source geothermal heat pump from Maritime Geothermal.

Construction of two Model Homes utilizing renewable energy: $ 538,962
Includes Living Stone Lodge contruction budget and additional concrete thermal conductive admixture and consulting services.

Measurement and Verification (M&V) expense: $11,500
Final audits, comparison reports and documentation of energy performance metrics provided by Home Energy Science with Energy Star and specialized industry expertise.

Commercialization expense: $ 131,400
Commercialization activities include customized, exclusive LSL 22.5 degree ICF corner block; estimated manufacturing setup costs; and development and publication of a builder's manual.

Personnel Costs: $ 75,254
This includes a project manager's salary for the duration of the project. This position is a fulltime project specialist responsible to manage all aspects of the project.

PHASE III PROJECT COST ANALYSIS

Project Per Square Foot Calculations: Two 2,600 sq. ft. homes = 5,200 sq. ft.

Project Cost Analysis based on 5,200 Square Feet Total		Cost Per Square Foot	
Architectural fees	$ 35,000	$	6.73
Structural Engineering	$ 33,060	$	6.36
Mechanical and Electrical Engineering	$ 92,636	$	17.82
Thermal Conductive concrete Design	$ 20,000	$	3.85
Energy Audit and Data Analysis	$ 11,500	$	2.21
Manufacturing/Commercialization	$ 131,400	$	25.26
Construction Cost	$ 594,216	$	114.27
TOTAL PROJECT COST	$ 917,812	$	176.50

Living Stone Lodge Cost Summary

PROJECTED COMMERCIALIZATION SAVINGS - PER HOME 5.5%

Comparison of our current construction costs with the projected affordability goals from achieving the building efficiencies and commercialization objectives in the proposal:

Projected Cost Savings	Per Home
20% reduction: Labor and ICF block cost	$ 4,200
50% reduction: Labor for window and door buck installation	$ 1,500
20% reduction: Roof panels when manufacturing in quantity	$ 4,000
45% reduction: New skylight design and purchase in quantity	$ 1,032
27% reduction: Manufactured identical size doors	$ 1,227
21% reduction: Manufactured cabinet packages	$ 1,214
20% reduction: Labor HVAC pre-assembled and tested mechanical room	$ 1,300
TOTAL PER HOME SAVINGS ESTIMATE	$ 14,473

Total estimated savings per home is $14,473.00 with manufacturing and efficiencies realized from this project or an estimated **5.5% savings of the total construction costs per home which is expected to bring the total construction cost to less than $100 per square foot.**

LIVING STONE LODGE: Home Costs

General Information: The materials and costs listed below represent one home only and have been developed from actual material bids for the 2019 Construction season. All of the costs include freight delivered to the Twin Buttes job site unless listed otherwise. In some cases the freight may be estimated based on the actual delivery date but have been noted that way.

Project Name:	LSL 3 Home Construction	**4/22/2019**	**Total** **$259,481**
Excavation **$ 568.75 ***	**Natural Fines (Sand)**---------- $22.75 per Ton **Class 5 (Gravel)**---------- $39.95 per Ton (Estimated one truck load sand for general use excavation & trenching) **Fisher Industries**-------25 ton truck load----------$568.75		
Soil Testing **$1,012.00 ***	**Soils Engineer** Braun Intertec---------- $1,012.00 (Proof for 1500 PSF undisturbed soils)		
Concrete Testing **$487.50 ***	**Concrete Testing** Braun Intertec----------$487.50 (Includes Random two cylinders per home for ICF walls only)		
Plumbing Underground **$2,940.00 ***	**Sewer** 60’ of 4“ sch. 40 PVC pipe and fittings----------$ included **Water** 120’ 1” waterline, fittings and valve----------$ Included (Main connection for sewer and water supply) **Quality Dirt Works**---------- $2,940.00		
Concrete Footing **$7,744.00 ***	**Concrete** 15 cu. Yards @ $185.00 each----------$ 2,775.00 **Rebar** 480 L. Ft. @ $11.00 per 20’----------$ 264.00 **Chairs** 100 each @ .45 cents each----------$ 45.00 **ICS**---------- -$4,660.00		

Footing Precut-Insulation **$3,850.00 ***	**3'x 8' Type IX** **EPS**----------$634.00 **1'x 8' Type IX** **EPS**----------$211.00 **8"x 8' Type IX** **EPS**----------$141.00 **Freight**----------$464.00 (All insulation is 4" Type IX EPS for in ground use) **ICS**----------$2,400.00
ICF Forms for Wall **$21,000.00 ***	**Amvic ICF** Forms and Accessories----------$ 8,050.00 (Includes all ICF Blocks with precut ends to form the 22.5 degree angle corners, Zip ties, foam sealant with gun and cleaner. Also includes freight). **ICS**----------$12,950.00
Window & Door Buck System **$3,999.00 ***	**Hybrid Custom Forms** 32 each 8' bucks @ $31.20 each----------$ 999.00 (Provided by Designer of this product from MN for 10 openings) **ICS**----------$3,000.00
Concrete for Wall **$8,105.00 ***	**Concrete** 35 cu. Yards @185.00 each----------$ 6,475.00 **Rebar** 2800 L. Ft. @ $11.00 per 20'----------$ 1,540.00 **J Bolts** 50 each ½" x 12" anchor bolts----------$90.00 **ICS**----------$ Included
EPDM Water Proofing Membrane **$1,940.00 ***	**EPDM Rubber membrane** 970 sq. ft. @ .75 Cents per----------$727.50 (This is a peel and stick product by Carlisle or similar) **ICS**----------$1,212.50 (Note: Spray application may be used if approved by Architect)
Lumber Top Plate 2x6 **$1,090.00**	**2"x 6" x 10' Green Treat** 16 each----------$ 175.00 **2"x 6" x 10' #2 or better** 16 each----------$ 115.00 **Polar Construction**----------$800.00
Steel for Roof System **$4,135.00 ***	**Compression Ring**----------$ 1,600.00 **Beam Saddles** 16 each @ $100.00 per----------$ 1,600.00 **5/8"x 7" Structural Bolts** 90 each @ $1.50 per----------$ 135.00 (Note: Bolts include nuts and 10 spares for damage or loss) **Polar Construction**----------$800.00

Glulam Beams Roof System **$8,164.00 ***	**Glulam Beams 26.5'** 16 each @ $390.00----------$ 6,240.00 **Rubber Seals 26.5'** 16 each Crush seals----------$424.00 (This price includes individual wrap and freight to Twin Buttes) **Polar Construction**---------- $1,500.00
SIPS Roof Panels **$25,885.00 ***	**Enercept Roof Panels** SIPS Roof System---------- $20,885.00 (Includes all sealants, seam tape, and fasteners) **Polar Construction**---------- $5,000.00
SIPS Entry Porch **$2,554.00 ***	**Enecrcept Porch Panels** SIPS Porch Assembly---------- $1,354.00 (These panels form the entire porch including a two piece roof and are provided with all fasteners and sealants to assemble). **Polar Construction**---------- $1,200.00
Steel Mechanical Room **$3,775.00 ***	**Mechanical room** 3/16" Plate 4'x10'x8'---------- $3500.00 (Primed inside and outside also delivered to site) **Legend** **Air**---------- $275.00 (Installed and anchored down to concrete floor)
Mechanical Room ERV Ventilation **$2141.00 ***	**ERV Broan 250 TE** 241 CFM Vent system---------- $1,891.00 (Includes 3 switches, kitchen and two bathrooms) **Legend** **Air**---------- $250.00
Mechanical Room Boiler, Panel & Tank **$4,990.00 ***	**Boiler** Weil McLain ECO 70---------- $2,310.00 **Pump Panel** Heat Link 4 pump---------- $1,220.00 **Water Tank** Aqua Plus 45-S2----------$990.00 **Expansion Tank** Extrol Hydro 4.4 Gal.----------$41.00 **Low Water Cutoff** 45-550SV---------- $154.00 (These are matched items with plug and play controls included) **Legend** **Air**---------- $275.00
Mechanical Room Controls & Plumbing Needs **$514.00 ***	**T-Stats** Honey well Focus Pro 6, 2 each @ $82.00---------- $164.00 **Fittings & pipe** Assorted as needed---------- $350.00 (The Mechanical room is pre-plumbed and tested prior to shipping) **Legend Air**---------- $ Included

Steel Mechanical Pit **$1,175.00 ***	**Mechanical Pit Box** 3/16" Plate 3'x9'x2.5'----------$875.00 (Primed inside and outside, acts as concrete form during the monolithic placement of the interior concrete floor). **ICS**----------$300.00
Wire Mesh and Pex Tubing **$1985.00 ***	**6"x 6" Wire Mesh** 2000 sq. ft. @ .17 cents per----------$340.00 **Zip Ties for Pex tube** 600 each @ .05 cents per----------$30.00 **Pex Tube ½"** 4 rolls 300' each/ 1200' total----------$600.00 **Legend** **Air**---------- $1,015.00
Concrete Floor **$20,179.00 ***	**Concrete** 34 cu. Yards @ $185.00 each---------- $6,290.00 **Rebar** 3200 L. Ft. #4 bar @ $6.00 per 20'---------- $ 960.00 **Chairs** 800 each @.45 cents each----------$360.00 **Sand Bed** 4" sand fill 25 cu. Yards @ $22.75---------- $569.00 **ICS**---------- $12,000.00
Concrete Entry Porch **$1,153.00 ***	**Concrete** 3.5 cu. Yards @ $185.00 each---------- $647.50 **Rebar** 140 L. Ft. #4 bar @ $6.00 per 20'----------$42.00 **Chairs** 30 each @ .45 cents each----------$13.50 **ICS**----------$450.00
Roofing **$9,227.00 ***	**Shingles** Landmark Weather wood 30 year---------- $4,727.00 (Roof package includes Shingles, Ridge cap, Felt, Ice & Water, Gutter Apron, Roof Edge, and starter Shingles) **J-Heart Contracting**---------- $4,500.00
Skylight & Curb **$2,493.00 ***	**Wasco Skylight** DDCCM-60" Triple Dome---------- $1,443.00 **Bench Mark Fabricated Curb** 60" Curb----------$750.00 **EPDM Rubber Ring** 90" Flashing Ring---------- $100.00 **Polar Construction----------** **$200.00**
Gutters **$1,180.00 ***	**Reliable** Gutters and downspouts----------$ Included **Reliable Rain Gutter**---------- $1,180.00

Exterior Doors & Windows **$7,313.00 ***	**North Star Windows** 9 each triple pane windows---------- $4,371.00 **North Star Doors** 3 each Exterior doors---------- $1442.0 (Freight Costs will average $300.00 per home)---------- $300.00 **Polar Construction**---------- $1,200.00
Siding **$13,290.00 ***	**Siding** LP Smart side---------- $6,134.00 (Siding includes: Ground breaker, Trim, Colored Fasteners and caulking, siding and touch up paint. **Polar Construction**---------- $7,156.00
Soffit & Fascia **$1,216.00 ***	**LP Fascia / Rollex** **Soffit**----------$1216.00 (Package includes F channel, angle flashing and all screws). **Polar Construction**---------- $ Included
Interior Framing **$9,026.00 ***	**Wagon Wheel Lumber**---------- $3,026.00 (Package includes 2x materials, OSB decking, stair stringers and treads, adhesive). **Polar Construction**---------- $6,000.00
Loft Deck & Storage framing **$2,580.00 ***	**W.B. components**---------- $2,580.00 (Includes 16 each wedge shaped 2”x 10” loft deck framed panels and 8 each loft storage area panels as per S1.3 drawing details. **Polar Construction**----------$ Included
HVAC Rough In **$1,715.00 ***	**HVAC All Piping**----------$ 800.00 (Includes Flex vent, PVC vent, spiral pipe, gas line, PVC intake & exhaust, dryer vent and fittings. **Legend Air**---------- $915.00
HVAC Top Off **$1423.00 ***	**HVAC All Terminations**----------$573.00 (Includes air intake vents, air exhaust diffusers, roof exhaust and intake fixtures. Gas line fittings, gas valves, flex connectors, regulators and fittings. **Legend Air**---------- $850.00
HVAC Mini Split AC **$1512.00 ***	**Ferguson Fujitsu** 1,800 Btu AC---------- $1,512.00 **Legend Air**----------$ Included

Plumbing Rough In **$3,712.00 ***	**Ferguson**----------$712.00 **Little Mac Plumbing**----------$3,000.00
Plumbing Finish **$5,066.00 ***	**Ferguson** B871955----------$2,066.00 (Quote includes everything for interior and exterior to finish) **Little Mac Plumbing**----------$3,000.00
Electrical Rough/Finish **$20,798.30 ***	**Materials**---------- $ Included **Olson Electric**---------- $20,798.30
Electrical Fans, Fixtures and LED Bulbs **$1,634.00 ***	**Hunter Ceiling Fans** 7 each with 3 bulb kit----------$794.00 **Menards light fixtures**----------$595.00 **Sylvania LED Bulbs** 24 each-40W, 60W, 75W and 100W----------$245.00 **Olson Electric----------** **$ Included**
Drywall **$9,680.00 ***	**Material** Sheetrock---------- $3,680.00 **New Image and Design**---------- $6,000.00
Painting **$3,000.00 ***	**Paint** Allowance for 45 Gal.----------$ 1,000.00 **Polar Construction**---------- $ 2,000.00
Cabinets & Counter tops **$9,324.00 ***	**Bertch Cabinets**---------- $5,782.00 **Counter Tops**---------- $1,142.00 **Polar Construction**---------- $2,400.00
Interior Doors & Trim **$7,442.53 ***	**Wyndham (Bertch)** 13 each 2’8” x6’ 8” @ $349.66---------- $4,545.53 **Wyndham (Bertch)** Molding inner & outer---------- $1,172.00 **Polar Construction**---------- $1,725.00

Flooring **$13,213.00 ***	**Shaw Vinyl plank** 1.45 per sq. ft. x 2,100 ft.----------$3,045.00 **Shaw Vinyl Glue** 3 pales @$117.51----------$353.00 **Shaw Cove Base** 600 L. ft. @$.80 cents ft.----------$480.00 **Shaw Carpet with pad** 936 sq. ft.----------$2,460.00 **Ruebs Flooring**----------$6,875.00
Appliances **$4,340.00 ***	**Washer/ dryer**----------$1,180.00 **Dish washer**----------$545.00 **Range/microwave**----------$1,080.00 **Refrigerator**----------$1,535.00 **Installation**----------**$ Included**
Final Cleaning **$910.00 ***	**Cleaning Services** .35 cents per foot 2600 Sq. Ft.----------$910.00

Jiran Architects & Planners, PC

1431 Interstate Loop
Bismarck, ND 58502
(701) 258-7771
(701) 258-1672 Fax
e-mail: jeff@jiranpc.com

Twin Buttes-Living Stone Lodge
708 79 East Avenue N.W.
Halliday ND 58636
Phone # 701-938-4403
Fax # 701-938-4340

Attn: Geordan Traver
Project Specialist
701-421-0224

RE: Living Stone Lodge

Dear Geordan:

Thank you for the opportunity to work with you and your staff on the design and construction of the Living Stone Lodge. I have enjoyed working on this project very much in the past and I look forward to taking the plans to the next level to achieve greater sustainability and cost efficiency.

The following is a listing of the scope of work that my office intends to supply for this project:

- **Research Phase:** With a focus on redesign and construction techniques to reduce overall costs of constructing the building envelope, Jiran Architects intends to provide additional focus to include insulation values and materials to enhance the net zero building envelope goals.

- **Design:** Jiran Architects intends to design efficient and easy access utility corridors to allow for the easy installation of Energy or heat Recovery ventilation and renewable energy provided by air source heat pumps, water to water source heat pumps, geothermal, wind, solar, or any new renewable technology that may become available in the future. Our firm will provide these designs to take advantage of unused spaces within the structure and always have easy removable access locations.

- **Manufacture's Support Drawings**: Jiran Architects will create the needed detailed line drawings with multiple views and all dimensions to provide simplified information to manufacture the building components for the Living Stone Lodge Structures. We will also provide continued support for upgrades and material changes to reduce the overall cost of these parts and constructability of the buildings.

- **Alternative Architectural Design:** Design and draft blue prints for additional multifamily housing floor plans to include a Duplex and Triplex maximizing the floor space and utilizing the same Living stone Lodge Building envelope. These drawings will provide for Floor plans,

Elevations, Sectional views and support for the structural, mechanical, and electrical engineering. Plans will comply with all North Dakota State building regulations and codes as required.

- **Contract Administration:** During construction, Jiran Architects will conduct on site monthly construction coordination meetings and produce meeting minutes. We will also prepare Owner / Contractor contracts, review all shop drawings, and prepare any field or change orders that may be necessary during construction.

- Jiran Architects proposes a **lump sum fixed fee in the amount of $35,000** to provide the services described above.

Thank you again for the opportunity to work with you on your future projects. Please feel free to contract me with any questions you may have regarding this proposal.

Respectfully submitted,

JIRAN ARCHITECTS & PLANNERS, PC

Jeff Welch, A.I.A.
Owner & Principal Architect

1000 East Calgary Ave. Suite 2
Bismarck, North Dakota 58503
Office | 701.221.3286
CWSTRUCTURAL.NET

CWSTRUCTURAL
ENGINEERS

July 3, 2019

Mr. Corey Spotted Bear – Councilman
TAT, Twin Buttes South Segment
708 79E Avenue NW
Halliday, ND 58636

RE: Living Stone Lodge – Structural Engineering Fee Proposal

Dear Mr. Spotted Bear;

Thank you for contacting **CW**STUCTURAL Engineers regarding a proposal for further analysis and design regarding affordability and net zero goals for the Living Stone Lodge structure. We have found our involvement in the development of the current structure design very rewarding and look forward to further refinement and development of the design as the potential for the project is very promising. We understand the proposed further design development to include the following 5 steps or phases;

#1 Research Phase (40 hours ED): Focus on redesign and construction techniques to reduce overall costs of fabrication and construction relative to the building envelope and structure including structural components and their connections. This will include further refined Structural analysis in an effort to refine and simplify the design reducing cost. Additional focus will be on offsite assembly and manufacturing of building components to reduce construction time and cost on site.

#2 Design Phase (32 hours ED): Design of efficient and easy access utility corridors to allow for easy installation of Energy or Heat Recovery ventilation and renewable energy provided by air source heat pumps, water-to-water source heat pumps, geothermal, wind, solar, or any new renewable technology that may become available in the future. Design dedicated utility corridors to take advantage of unused spaces within the structure to allow corridors to extend new utility lines with easily removable access locations.

#3 Manufacturer's Support Drawings (20 hour ED 7 40 hours DR): Develop the necessary detailed drawings with multiple views and all dimensions required to provide necessary information to manufacture refined building structural components and their connections developed in the research and design phases.

#4 Structural Design (20 hours ED & 60 hours DR): Provide Structural engineering analysis, design and development of complete detailed Structural Construction Documents sealed by a licensed Professional Engineer for additional multi-family units to include a Duplex and Triplex maximizing the floor space and utilizing the same general exterior Living Stone Lodge building envelop structure developed previously, The drawings will include all Structural plans, elevations, sections, material specifications, necessary to manufacture, fabricate and construct the building structure and its structural components.

#5 Four Out of Town Site Visits: Four requested out-of-town trips to the site during design or construction. Additional out-of-town Site Visits will be considered Additional Services and shall be billed at a fee of $1,175 per trip.

Based on the above requested project scope of work and services and the associated estimated hours of work for

each of the 5 project phases listed above and our current office hourly rates we propose a fee of $33,060. Please reference the attached current office hourly rate schedule.

Sincerely,

Chris Wentz, P.E. – President
CWSTRUCTURAL Engineers

cc: file
att: CWS Hourly Rate Schedule

1000 E. Calgary Avenue, Suite 2
Bismarck, North Dakota 58503
office | 701 221.3286
cwstructural.net

CW STRUCTURAL ENGINEERS

Hourly Rate Schedule

(January 1, 2019)

Principal Project Structural Engineer	**$155.00/Hour**
Senior Project Structural Engineer	**$145.00/Hour**
Project Structural Engineer	**$140.00/Hour**
CADD Project Manager	**$110.00/Hour**
CADD Technician III	**$100.00/Hour**
CADD Technician II	**$90.00/Hour**
CADD Technician I	**$80.00/Hour**
Engineering Technician III – E.I.T. III	**$125.00/Hour**
Engineering Technician II – E.I.T. II	**$110.00/Hour**
Engineering Technician I – E.I.T. I	**$90.00/Hour**
Clerical/Administrative Assistant	**$65.00/Hour**

PRAIRIE ENGINEERING, P.C.

619 Riverwood Drive, Suite 205
Bismarck, ND 58504-4304

Telephone 701-258-3493
Fax 701-258-6857

PROJECT NO. 195XX **DATE:** 07/11/2019

AUTHORIZATION AND AGREEMENT FOR ENGINEERING SERVICES

CLIENT:

FIRM:	MHA Nation South Segment Twin Buttes-Living Stone Lodge
CONTACT NAME:	Cory Spotted Bear
BILLING ADDRESS:	708 79 E Avenue NW Halliday, North Dakota 58636

PROJECT DATA:

JOB TITLE:	Twin Buttes – Living Stone Lodge
DESCRIPTION OF WORK:	Mechanical and electrical design services associated with the design of a 'Net Zero' lodge. Work includes 'Net Zero' system research, hydronic heat and forced air heating and cooling design and 4 site trips for project observations.
ESTIMATED AREA (SF):	Not Applicable
ESTIMATED BUDGET:	Not Applicable

ENGINEERING SERVICES:

BASIC: Provide mechanical and electrical services as necessary for a 'Net Zero' type lodge. Services include mechanical and electrical system research for 'Net Zero' systems and strategies, two distinct system designs for hydronic heat and forced air heating and cooling, shop drawing review, miscellaneous construction administration involvement such as assisting contractors with construction document questions and 4 planned site trips at key times during the construction process to observe rough in installations, system installations, system setup and operation observations and system performance observations.

ADDITIONAL: Provide additional mechanical and electrical services as requested by Traver Industries, Inc.

Additional trips will be provided as requested.

REIMBURSABLES: Mileage involved with site trips will be considered a reimbursable expense.

ENGINEERING FEES:

BASIC SERVICES: Hourly not to exceed predetermined amounts. See attached document for breakdown of basic services and associated hourly to exceed amounts.

ADDITIONAL SERVICES: Hourly per attached Standard Fee Schedule dated October 1, 2018.

REIMBURSABLES: Per attached Standard Fee Schedule dated October 1, 2018.

Engineering Proposal for Living Stone Lodge

Date: July 11, 2019

Part 1 - Net Zero Research and Development Phase (Hydronic Heat and Forced Air Heating and Cooling Applications)

Division	Staff	Hours	Rate	Cost
Mechanical	Jerod	120	$ 85.00	$ 10,200.00
	Randy	35	$ 155.00	$ 5,425.00
Electrical	Brad	120	$ 85.00	$ 10,200.00
	Jeremy	40	$ 155.00	$ 6,200.00
Total				$ 32,025.00

Part 2A - Preparaton of Construction Documents - Hydronic Heating System Design

Division	Staff	Hours	Rate	Cost
Mechanical	Jerod	90	$ 85.00	$ 7,650.00
	Randy	20	$ 155.00	$ 3,100.00
Electrical	Brad	90	$ 85.00	$ 7,650.00
	Jeremy	20	$ 155.00	$ 3,100.00
Total				$ 21,500.00

Part 2B - Preparaton of Construction Documents - Forced Air Heating and Cooling Design

Division	Staff	Hours	Rate	Cost
Mechanical	Jerod	90	$ 85.00	$ 7,650.00
	Randy	20	$ 155.00	$ 3,100.00
Electrical	Brad	90	$ 85.00	$ 7,650.00
	Jeremy	15	$ 155.00	$ 2,325.00
Total				$ 20,725.00

Part 3 - Shop drawing review (For both hydronic and forced air designs)

Division	Staff	Hours	Rate	Cost
Mechanical	Jerod	24	$ 85.00	$ 2,040.00
	Randy	2	$ 155.00	$ 310.00
Electrical	Brad	24	$ 85.00	$ 2,040.00
	Jeremy	2	$ 155.00	$ 310.00
Total				$ 4,700.00

Part 4 - Construction Administartion Tasks (For both hydronic and forced air designs)

Division	Staff	Hours	Rate	Cost
Mechanical	Jerod	24	$ 85.00	$ 2,040.00
	Randy	4	$ 155.00	$ 620.00
Electrical	Brad	24	$ 85.00	$ 2,040.00
	Jeremy	4	$ 155.00	$ 620.00
Total				$ 5,320.00

Part 5A - Site Visit to Twin Buttes (4 trips total)

Per Trip Cost

Division	Staff	Hours	Rate	Cost
Mechanical Travel	Jerod (4 trips)	16	$ 85.00	$ 1,360.00
	Randy (2 trips)	8	$ 155.00	$ 1,240.00
Electrical Travel	Brad (4 trips)	16	$ 85.00	$ 1,360.00
	Jeremy (2 trips)	8	$ 155.00	$ 1,240.00
Mechanical Site Time	Jerod (4 trips)	8	$ 85.00	$ 680.00
	Randy (2 trips)	4	$ 155.00	$ 620.00
Electrical Site Time	Brad (4 trips)	8	$ 85.00	$ 680.00
	Jeremy (2 trips)	4	$ 155.00	$ 620.00
Subtotal				$ 7,800.00

Mileage	Description	Miles	Rate	Cost
	118 miles - one direction	944	$ 0.60	$ 566.40
Subtotal				$ 566.40

Total trip cost for 4 trips $ 8,366.40

Part 5B - Additional Site Visit to Twin Buttes (per trip as requested)

Per Trip Cost

Division	Staff	Hours	Rate	Cost
Mechanical Travel	Jerod	4	$ 85.00	$ 340.00
	Randy	4	$ 155.00	$ 620.00
Electrical Travel	Brad	4	$ 85.00	$ 340.00
	Jeremy	4	$ 155.00	$ 620.00
Mechanical Site Time	Jerod	2	$ 85.00	$ 170.00
	Randy	2	$ 155.00	$ 310.00

Electrical Site Time	Brad	2	$ 85.00	$	170.00
	Jeremy	2	$ 155.00	$	310.00
Subtotal				$	2,880.00

Mileage	Description	Miles	Rate	Cost	
	118 miles - one direction	236	$ 0.60	$	141.60
Subtotal				$	141.60

Total per trip cost	$	3,021.60

Total Mechanical and Electrical Engineering Fee with a total of 4 trips included and no addditional trips included	**$**	**92,636.40**

Prairie Engineering, P.C.
Professional Consulting Engineers

Hourly Rates/Expense Rates
Effective October 1, 2018

Principal	$155 Per Hour
Senior Engineer	$115-$145 Per Hour
Engineer	$85-$105 Per Hour
Designer	$70-$100 Per Hour
Secretary/Accounting	$55 Per Hour
Reproduction: Blueprints	$2.50/Sheet or Cost from Commercial Printer Plus 10%
Reproduction: Specifications	$0.20/Sheet or Cost from Commercial Printer Plus 10%
Mileage	$0.60 Per Mile
Postage, Telephone, Office Supplies	Cost Plus 10%
Outside Consultants (if required)	Invoice Plus 10%

ENZO™
Energy System Supplies

600 Kalmia Way
Broomfield, CO 80020
Office: 303.903.6642
Sales: 303.807.8932
Fax: 720.596.8851

Project Proposal

Date: July 21, 2019
To: MHA Nation, South Segment Twin Buttes-Living Stone Lodge
From: Mary Jo Guarrero, President
RE: Enzo Thermal Conductive Add-mixture for Concrete

Project Description:

MHA Nation, South Segment Twin Buttes Living Stone Lodge ("Client") would like to engage Enzo USA, Inc. to review, formulate and commission a conductive add-mixture for radiant floor heating and cooling systems that may be used in one or more single family residence located in North Dakota.

Enzo USA, Inc. has developed a tried and proven thermal conductive add-mixture for concrete. The methods and engineering of the add-mixture is proprietary and protected. Enzo can provide a unique design add-mixture for the Living Stone Lodge Project, specifically, the two net-zero homes being built in next year. The purpose of the conductive add-mixture is to verify that the energy transfer is improved in both conductivity and diffusivity for the purpose of energy efficiency and comfort, particularly in the shoulder months of operations.

Design reviews will be coordinated along with other engineering disciplines (for example - knowing all structural requirements of the conductive surfaces and having the loads of the building performed before construction to determine the energy consumption and inside air temperatures). We will review the measurement and verification (M&V) equipment as well as energy bills for continuous commissioning and tracking of products and processes used for reducing the home's energy consumption.

Our proposal and fees are based upon the proposed architectural drawings and the Client's stated project goals and requirements for design and commissioning the monitoring system including producing the dashboards.

Services Provided:

1. Development of custom formulations of Enzo add-mixture for this specific project.
2. Commissioning services before, during and after the installation of add-mixtures from batch plant to installation and finishing work, to coordinating service providers and engineering work.
3. Commissioning work includes review of ACI Tech and batch plant reports (including tickets).
4. Up to four site visits and four overnight stays, follow up phone calls, emails and Q&A for contractors.

Assumptions:

1. Complete set of approved architectural drawings will be supplied by Client in AutoCAD 2010 or REVIT 2017 format.
2. Batch mix and onsite flatwork performed by others.
3. Structural engineering of slab and other structural components for the residence is excluded.
4. Civil engineering and soils reports completed in time to model add-mixtures 60-days prior to construction.

Fees:

- The fee for the development of add-mixture formulation and project commissioning: $20,000.00. Included in this fee are up to four (4) site visits to North Dakota.
- Client will be responsible to pay additional costs for ACI testing fees, raw materials and shipping of raw materials. There is no estimate of these costs at this time but Enzo USA, Inc. will work with the product engineers and will strive to produce an affordable solution considering that some or all rebar reinforcement may be removed and replaced by various fibers for structural strength.
- A 50% deposit is required to commence the development of formulations for add-mixture. If the project exceeds a one-month period, Client will be invoiced monthly based upon the percentage of project's completion. Payment is due 15 days upon receipt of invoice.
- Additional add-mixture formulas may be requested for $2,000.00 per formula.
- Prior to the release of documents required to obtain a building permit (i.e. stamped and signed documents), all invoices must be paid.
- Any invoice with an outstanding balance 60-days overdue will have interest compounded weekly at 2%.

Schedule:

Under these proposed services, Enzo USA, Inc. agrees that we have sufficient capacity to perform the services in a timely manner up to the date the proposal is valid. As a successful project requires effective communication, Enzo USA, Inc. is relying on the Client to set an effective schedule to meet project goals. **It is the Client's duty of cooperation to effectively communicate all deadlines and dates of deliverables with at least one week's notice prior to any deadline**.

Enzo USA, Inc. will respond to all emails within 48 hours or within two business days, all phone calls within 48 hours or within two business days. Delays in work that last longer than 90 days are subject to a renegotiated completion date along with our fee's.

Revisions and Client Review:

Changes to architectural drawings after the development of formulations that result in the addition, subtraction or alteration that is greater than 5% of the total square footage, will result in renegotiation of our fees.

Enzo USA, Inc. shall correct any deficiencies in technical accuracy without additional compensation except to the extent such corrective action is directly attributable to deficiencies in Client-furnished information. Enzo USA, Inc. will not be responsible for (1) inaccuracies, errors, or omissions in data other than its own or its subcontractors, or (2) improper interpretations or use by others of any data.

If required, additional services will be billed on an hourly basis or at an agreed flat fee. Additional services will be provided only upon written authorization by the Client.

Current hourly rates:

Principal Engineer:	$190.00/hour
Mechanical Engineer:	$150.00/hour
Plumbing Engineer	$150.00/hour
CAD:	$100.00/hour
Admin:	$75.00/hour

Indemnity:

Enzo USA, Inc. shall indemnify and hold the Client, its parent, affiliates, subsidiaries, agents, officers, director and employees harmless against all liabilities, claims or demands (including costs, expenses and attorney's fees) that may be made by anyone for injuries to persons or damage to property, including theft, resulting from Enzo USA, Inc., or persons employed or furnished by Enzo USA, Inc., acts, omissions, or violations of any statue, ordinance, code or regulation. Enzo USA, Inc. shall defend the Client against any such liability, claim, or demand should the Client request.

The Client shall indemnify and hold the Enzo USA, Inc., its parent, affiliates, subsidiaries, agents, officers, director and employees harmless against all liabilities, claims or demands that may be made by anyone for injuries to persons or damage to property, including theft, resulting from the Client, or persons employed or furnished by the Client, acts, omissions, or violations of any statue, ordinance, code or regulation. The Client shall defend the Enzo USA, Inc. against any such liability, claim, or demand should the Enzo USA, Inc. request.

Dispute Resolution:

If a dispute arises out of or relates to this Agreement or its breach, the parties shall endeavor to settle the dispute first through direct discussions between the parties' representatives, who shall have the authority to settle the dispute. Enzo USA, Inc. and Client agree to first mediate any dispute arising under this Agreement. The mediation shall be administered by the Colorado Office of Dispute Resolution, unless the parties agree otherwise. If during mediation a resolution cannot be agreed to then dispute shall be resolved in the county courts in Broomfield County, Colorado. The parties to this Agreement consent to venue and jurisdiction of such courts. In any dispute resolution proceeding between the parties to this Agreement, the prevailing party shall be entitled to recover its attorney's fees. This Agreement shall be governed by the substantive laws of the State of Colorado, without regard to conflicts of law provisions.

Use of Documents:

All documents that are produced by Enzo USA, Inc. are instruments of service in respect to this project. Under this Agreement, Client gives Enzo USA, Inc. permission to demonstrate our work on the project. Such demonstration may be architectural pictures of the project, pictures of the interior spaces, pictures of the systems, write ups explaining our work, use of the project in newsletters and website.

Acceptance:

This proposal is valid for 90 days from the date indicated on the first page. Enzo USA, Inc. will not start any work or put a project into our schedule until we have a signed Agreement.

If this proposal is acceptable, please sign, date and return it via email to me at the following email address: mj@enzo-usa.com.

If you have any questions, please contact me at 303-903-6642.

Kind regards,

Mary Jo Guarrero
President
Enzo USA, Inc.
600 Kalmia Way
Broomfield, CO 80020

Accepted By (Client):

_____
Signature

_____
Print Name Date

The person signing this proposal, the Client, represents to Enzo USA, Inc. that he or she is fully empowered and authorized to sign this proposal for the work, terms and conditions indicated.

Please fax executed document to:
Mary Jo Guarrero, mj@enzo-usa.com.

Home Energy Science

Henry Borysewicz
1855 Thomas Drive
Larimore, ND 58251
701-330-6680
www.HomeEnergyScience.com
e-mail: Henry@HomeEnergyScience.com

Proposal – Living Stone Lodge Project

Project Summary:

Five homes are to be constructed in Halliday, ND for The Three Affiliated Tribes, South Segment. These homes will be built during 2019 through 2020, with three scheduled to be completed in November or December of 2019. The other two will be completed in 2020 at a date to be determined. The homes will be based on the design of the Living Stone Lodge House, 8132 7D Street, Halliday ND 58636.

In an effort to improve and document the energy efficiency of these homes and to assess the potential of renewable energy options, **Home Energy Science** will provide consulting and testing services as outlined below. These services will be performed on the two homes to be built in 2020.

1. Construction Plan Review / Design Consultation

It is much easier, more effective, and far less expensive to build efficiency into a new home than it is to retrofit an existing building at a later time. A well-planned construction project - including careful attention to energy efficiency - can pay dividends over the life of the building.

Energy efficient buildings:

- Increase occupant comfort
- Lessen our demand for fossil fuels
- Decrease the need for new power generation plants, helping to keep energy costs down
- Reduce greenhouse gas emissions which contribute to climate change
- Benefit homeowners by lowering operating costs and preserving resale value

It is important that the energy efficiency of a home be addressed first, before planning the addition of renewable energy sources such as passive solar heating or photovoltaics. Further, energy efficiency itself is considered a renewable, green resource. The greenest energy is the energy you don't have to produce in the first place. This is why a careful building plan review before construction is so important to the future homeowners.

Home Energy Science will review provided construction plans, drawings, and documents and make recommendations and suggestions for possible modifications intended to improve the energy efficiency and comfort of the homes. These recommendations and suggestions will be provided in a written report.

Factors which will be considered include:

- Building shell or thermal envelope, including
    - Insulation
    - Fenestration
    - Air sealing
- Heating, Ventilation, Air Conditioning, including
    - Equipment sizing
    - Controls
    - Venting and Combustion Safety
    - Ductwork placement, insulation, and sealing
- Domestic Hot Water
    - Production and delivery
    - Conservation
- Lighting and Appliances
- Recommendations for Renewable Energy and Green Technologies, including
    - Daylighting
    - Passive solar
    - Photovoltaic
    - Ground source heat pumps
    - Wind

The Three Affiliated Tribes will evaluate these recommendations and incorporate them into construction plans as they deem appropriate for their needs and desired outcomes. Recommendations can be incorporated into these current home plans or considered for future iterations of this design.

2. Onsite Energy Efficiency Audit and Testing of Homes During and After Construction

A comprehensive energy audit includes on-site visual inspection of the energy features of the home and documentation of its general condition, including envelope features, equipment types, characteristics and ages, and appliance and lighting characteristics.

The on-site inspection includes measurement or estimation the following features:

- R-values of wall/ceiling/floor insulation
- Square footage and volume calculations
- Window type and efficiency: glazing type(s) and frame material(s)
- Heating and cooling system efficiency
- Type, model number, and location of heating/cooling system(s)
- Type of ductwork, location and R-value of duct insulation, and any indications of duct sealing
- Type of foundation - crawlspace, basement, or slab
- Indication of common air-leakage sites denoting likely opportunities for leakage reduction
- Blower door test to quantify the home's air tightness
- Estimated efficiency of major appliances such as dishwashers, refrigerators, freezers, washing machines and dryers
- Number and type of hardwired light fixtures
- Visual indications of condensation
- Presence and location of exhaust fans, and determination of whether they are vented outdoors
- Presence and type(s) of combustion equipment
- Indication of visually identifiable evidence of flame rollout, blocked chimney, and corroded or missing vent connector (combustion safety issues)

A Comprehensive Audit of a home can identify the sources of problems that waste energy, create poor indoor air quality, or reduce the comfort of the home. **Home Energy Science** will custom-develop an Audit Report for each of the five homes that summarizes testing results. These reports can be used to evaluate how closely post-construction home performance matches pre-construction energy efficiency goals.

3. Onsite Thermographic Inspection and Report

A thermographic inspection can reveal important information about a building's envelope. Thermography refers to the nondestructive testing of a building using infrared imaging equipment.

Home Energy Science uses thermography as a tool to help detect heat losses and air leakage in building envelopes. The infrared camera is used in conjunction with blower door testing equipment. The blower door helps exaggerate air leaking through defects in the building shell. Infrared imaging allows us to check the effectiveness of insulation and air sealing in a building's construction. Because wet insulation conducts heat faster than dry insulation, thermographic scans of roofs can often detect roof leaks.

In order to be successful, thermographic inspection requires the proper conditions. For example, to properly assess insulation quality, there must be a temperature differential of 18°F between interior and exterior held for at least four hours prior to testing. Obviously, weather conditions on the day of the site visit will determine if thermographic insulation assessment can be successfully accomplished. **Home Energy Science** will bring the necessary testing equipment to the site and perform infrared testing, conditions permitting.

Home Energy Science will custom-develop an Infrared Audit Report that summarizes testing results for each of the homes. These reports can be used to evaluate how closely post-construction home performance matches pre-construction energy efficiency goals.

4. Data Analysis and Visualization

Home Energy Science will assist The Three Affiliated Tribes with analysis and visualization of energy consumption data collected from these homes. Data will include weather, utility billing, and renewable energy production as applicable. Analysis will include interpretation of various data as it pertains to the home's efficiency performance. Visualization will include creation of charts, graphs, and other illustrations which will make raw data more easily understandable. A written report will be provided.

5. Consultation

Home Energy Science will be available to answer questions via email or phone throughout the planning, auditing, and testing process, and after reports are delivered. All inquiries will be answered in a timely manner.

Timeline / Deliverables

1. Construction Plan Review / Design Consultation

Construction review is dependent on **Home Energy Science** receiving pertinent construction documents from The Three Affiliated Tribes in a timely manner. In order to provide a comprehensive review, **Home Energy Science** may request further documentation or clarification of existing documents.

Written report will be provided no later than three weeks following final submission of all required documents to Home Energy Science by The Three Affiliated Tribes. Report will consist of PDF format electronic document, delivered via email.

2. Site Visits/ Building Inspection

Site visits for consultation, construction inspections, energy auditing, and testing will be done during construction and following completion of construction. **Home Energy Science** will arrange site visits with the designated representative of the Three Affiliated Tribes as construction begins and after it is complete.

Because of the long commute (~5 hours each way) arrival times must be estimated. **Home Energy Science** will coordinate site visits with the designated representative of the Three Affiliated Tribes.

3. Reports (Comprehensive Energy Survey, Thermographic Inspection Report)

Final reports will be provided within three weeks of last post-construction Site Visit. Reports will be delivered electronically (PDF file) via email.

4. Data Analysis and Visualization

Ongoing, as needed, for a period of one (1) year following final site visit. Further analysis can be arranged on separate contract.

5. Consultation

Ongoing, as needed, for a period of one (1) year following second site visit. Further consultation can be arranged on separate contract.

Total Price $11,500

Terms $3,500 on Plan Review, $3,500 on first Site Visit, balance due on final Site Visit

www.HomeEnergyScience.com

701-330-6680

Quote:

Living Stone Lodge Visual Builder's Manual Project

Prepared for: Cory Spotted Bear | MHA Nation, South Segment

Prepared by: Michael & Belinda Strotheide
Seed Stock Media, LLC
979-318-9158

July 2, 2019

PROJECT

400 page, 8.5" x 11" format, softcover book with full color cover, black and white interior, including 200 photographs, 100 illustrations, all technical copywriting and editing. Anticipated 16 weeks for production with 4 weeks additional for publishing.

BUDGET

Description	Cost	
Content Development, Technical Writing & Editing	$	38,400
Cover Design, Publication Design, Layout & Composition	$	7,500
Consultation/Meetings	$	2,000
Printing First Run 20 copies	$	500
Total	**$**	**48,400**

Writing Services include:	Design Services include:
• researching	• interior design concepts
• interviewing	• cover concepts
• content organization	• image layout and composition
• writing	• illustration editing
• editing	• art management
• proofreading	• print specifications
• formatting	• proof checking
• file maintenance	• production services
• project management	• print sourcing & management

Deliverables

- Cover designs (3 options)
- Progressive layout proofs
- Final first run print-ready pdf files
- First run 20 soft bound printed copies

Process

Materials:

Gather and Organize the materials supplied by the client.

Content Outline:

Create Outline Draft and meet with client to confirm project scope.

Design Layout:

Professional visual, graphics layout for uniformity and consistency.

Content Development:

Technical writing and editing focused on building simplicity into the instructional manual both visually and in written content.

Draft Review:

First draft is reviewed by client for revisions.

Publishing:

Publication management will be handled by Seed Stock Media and once revisions are made a short run (40) manuals will be published.

Additional costs not included above:
Travel expenses for meetings or press checks if needed

Payment Terms

Upon signed contract 50% retainer; final payment due when final electronic files are delivered and first run print is complete.

Proposal for Amvic R30, 6”, 22.5 degree ICF Block:

There would be no proprietary rites assigned to the 22.5-degree R30 ICF block, Amvic agrees that there will be an exclusive marketing agreement for the 22.5 degree R30 agreement within the USA and Canada for all US Registered Tribes and Canadian Treaty First Nation Bands Between Amvic and Twin Buttes- Living Stone Lodge. This agreement is to ensure that all enquires would be presented to Twin Buttes- Living Stone Lodge in order to ensure the marketing and ability to present all other third-party components are available for discussion. That after all marketing representations the fulfilment of such order would then be completed by the distributor of choice.

Design Stage $7,500.00

- Mold design for 22.5-degree corner
- Engineered
- Preliminary mold created
- Preliminary Mold used for sample production
- Preliminary product and mold design created
- 3D models are created to fit new 22.5* block with standard blocs, to build a wall suitable for Fort Berthold First Nations Community preferred design.
- Measurement confirmed
- Sign off on preliminary mold
- Order specifications sent for final pricing to manufacturer
- Manufacture confirms pricing, availability, and logistic instructions
- Sign off on final pricing and decision to move forward

Manufacturing Stage $37,500.00

- Final design sent to manufacturer
- Manufacture commences on production of mold
- Mold is tested at manufactures site to meet original order specifications
- Mold is shipped to Amvic

Implementation Stage
$5,000.00

- Mold is received by Amvic
- Mold is installed
- First production run with new mold
- Final product, measured and tested for:
    - Measurement
    - Physical properties
    - Material performance
    - Quality

Balanced of invoice to be adjusted based upon final cost (est.) TBD

$50,000.00

The overall estimated cost of this project should not exceed $ 55,000.00 up to the point of producing Amvic R30, 6” 22.5-degree ICF corner blocks.

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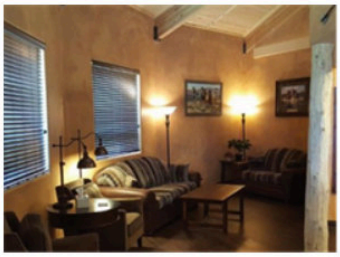
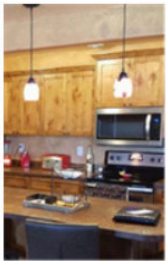
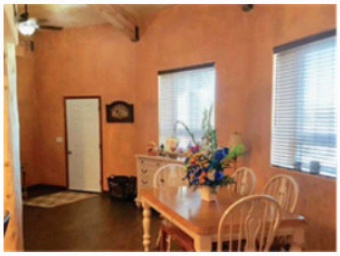


Living Room



Kitchen

Loft



Dining Room

Mission Statement

The South Segment administration will strive to serve members of the South Segment living both on and off the Fort Berthold Indian Reservation, to further their living standard, promote self-sufficiency, sustainable energy and food sustainability within the tradition of the Mandan, Hidatsa and Arikara Nation.

MHA Nation

Twin Buttes South Segment
Councilman: Cory Spotted Bear
Tribal Office:
708 79th East Av NW
Halliday, ND 58636
Phone 701-938-4403
Fax 701-938-4340

Project Specialist: Geordan Traver
traver.LSL@gmail.com
701-873-3700
Cultural Liaison: Diane Traver
drtraver.LSL@gmail.com
701-421-4144

Living Stone Lodge

2019
ICF Builder Awards
1st Place Winner

"Rounding the Corner"
For Tribal Housing

Living Stone Lodge Design

- Extreme Energy Efficiencies
- Excellent Indoor Air Quality
- Disaster & Storm Resistant
- Low Maintenance Costs
- Healthier Round Living Space
- Wisdom From Our Ancestors

Construction can be managed by local builders and laborers due to the simplicity of stacking and pouring the ICF Concrete walls. Roof support beams and Sips roof panels were installed by untrained volunteers.

The roof system needs no interior support walls making the home flexible for a variety of floor plans.

Light Weight ICF Block

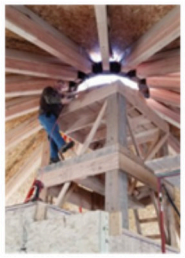
Easy to Stack ICF Walls

Locating Compression Ring

Adding SIPs Roof Panels

Completed ICF Walls

Installing Roof Beams



Removing Support

Self Supporting Roof System