

# SPOKANE INDIAN HOUSING AUTHORITY

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Spokane Tribal Administration Building

## **Tribal Administration Building 100kW**

**Recipient Organization:** Spokane Indian Housing Authority

**Project Title:** Children Of the Sun Solar Initiative (COSSI) FINAL

**Date of Report:** July 10, 2023

**Award Number:** DE-IE0000093

**Total Project Costs:** \$2,013,181

**Recipient Share:** \$1,013,181

**DOE Share:** \$1,000,000

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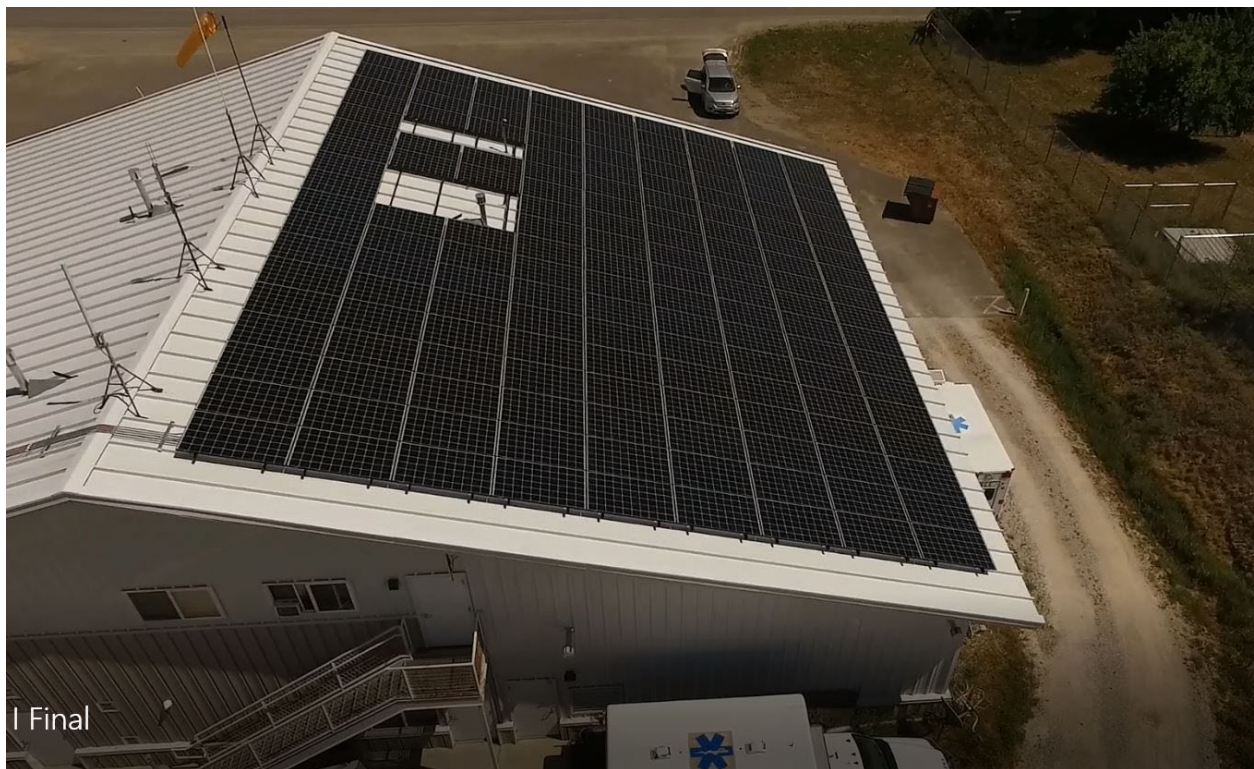
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## **DISCLAIMER**

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**Tribal Public Safety Building 19kW**



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**New House Lane 10 Homes with varied kW sizes 7.5kW – 12kW**

**1. Executive Summary & Project Scope:** The Children Of the Sun Solar Initiative (COSSI) project is based on a general review of the Tribe and Spokane Indian Housing Authority's (SIHA) buildings to identify appropriate solar photovoltaic (PV) system sizes and locations and furthers the Tribe/SIHA's prior work to implement projects consistent with our Long-Term Energy Vision. The project also includes working with the Spokane Indian Housing Authority's Weatherization Program that has more than 100 weatherization projects that include energy audits of buildings and SIHA managed homes along with privately owned homes. The project will help to achieve energy independence using clean energy technologies for SIHA and the Spokane Tribe. It's important to state that this is a first step energy project for the Spokane Tribe and the Spokane Indian Housing Authority. The project helped the Tribe and SIHA collaborate in its efforts on both Tribally owned buildings and SIHA managed buildings and residential rental units. So, this first project is a first step in taking on additional alternative energy projects such as solar, wind or other alternatives to energy generation or renewable sources.

The COSSI project proposal was to install a 637.5kW of solar PV on 14 SIHA and Tribal buildings on the Spokane Indian Reservation. **The Completed Project installed 652.5kW on 32 Buildings and homes. The energy produced in a 12-month period is an average of approximately 700,000kWh.** The project provided training and jobs for Spokane tribal members or their spouse and training for 4 to 6 Spokane tribal members during the initial installations, but it did not carry enough funding to further the employment of the Operation & Maintenance of the facilities installed. The revised plan is to train several of the local installers on the recent Spokane Reservation Residential Solar Energy Project (SRRSEP--AKA COSSI 2.0) to maintain the solar placed under the original COSSI project and the new COSSI 2.0 with the planned 119 solar installations. This plan with the new installations will keep two full time employees busy 80% of the year, the other 20% can be devoted to project planning and other electrical maintenance for the Spokane Indian Housing Authority.

The project timeline was not perfectly met, due to the initial building selection we ended up removing one 7000 Sq Ft Building (Alex Sherwood Memorial Bldg.) and finding a replacement building (Ford Youth Center) but SIHA adding 17 residential buildings to the project, the project moved forward without changing the overall objectives. The project began in 2018 and was completed in the late spring of 2022 with the completion of the installation on the Ford Youth Center.



**Sockeye Street 4 LIHTC Homes with 12kW**

**Project Objectives:** Tribe/SIHA's Long-Term Energy Vision:

- Installing solar PV systems on **9 Public Buildings** and **23 Residential that totals 32 Buildings**. The project will generate clean energy and reduce dependence on fossil fuels and reduce carbon emissions.
- Increasing energy efficiency and reducing energy costs for the high energy use buildings for the Spokane Tribe and the Spokane Indian Housing Authority's buildings and its rental tenants.
- Enhancing the Tribe's energy and economic infrastructure by developing renewable energy resources and promoting sustainability practices.
- Bringing reliable and affordable electric power and service to Indian land and homes for tribal members, especially those in remote or underserved areas.
- Design, build and operate approximately **652.5 kW** of solar photovoltaic (PV) systems at identified SIHA and Tribal buildings.
- Allow for the future incorporation of solar battery storage at key SIHA and Tribal buildings that are especially important to keep running during grid outages.
- Cost-effectively provide an estimated **23,126,810 kWh of electricity** over the Project's life to SIHA, the Tribe and Tribal seniors using Department of Energy (DOE) funding and tax credit value to reduce net development costs.
- Provide **employment for 6 Tribal members** with construction training and jobs and **2 members with long term jobs** for operation and maintenance (O&M) training.
- Provide a replicable example to other housing authorities and tribes of how to combine federal funding and tax credits to implement reliable, clean energy projects and lower energy costs and environmental footprints, while creating significant training and job opportunities.
- Work to achieve energy independence using clean energy technologies and keep up with the ever-advancing solar technology.

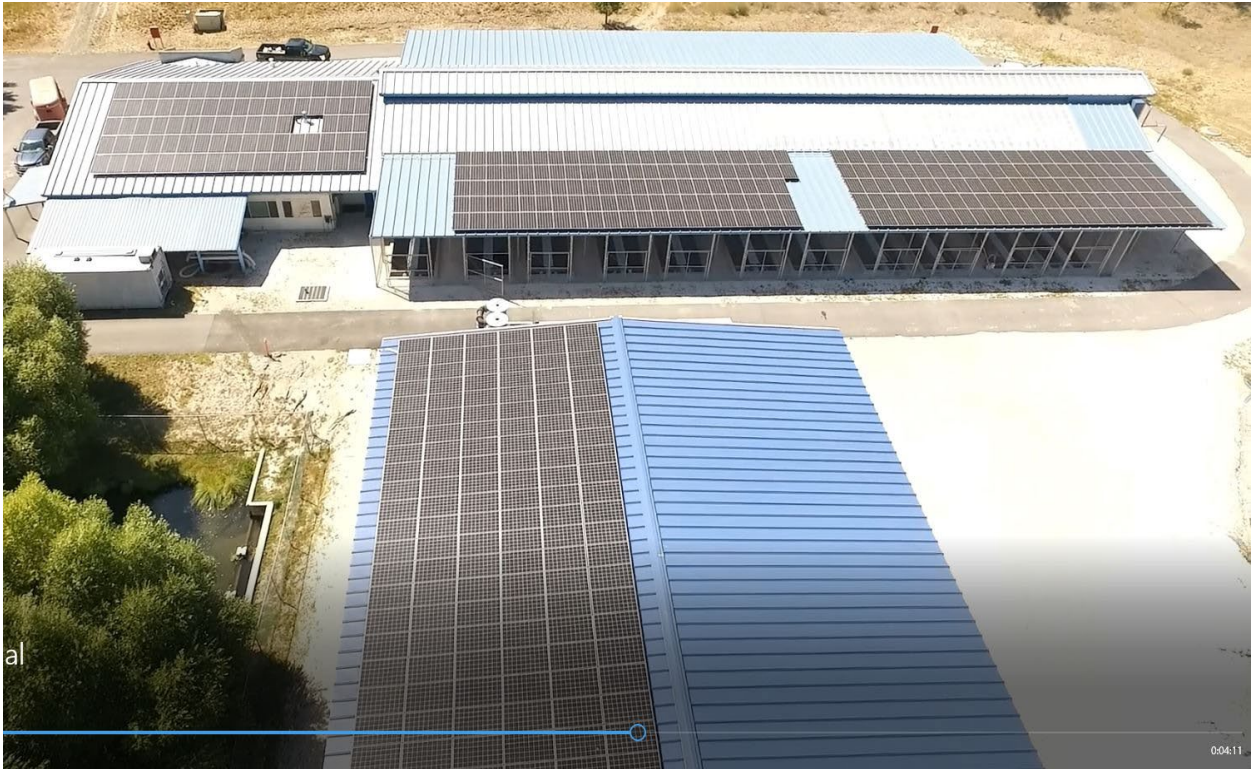


### **3. Project Results:**

- After conducting site assessments, feasibility studies, and design reviews to determine the best locations, equipment, and configurations for the solar PV systems an application for a project was submitted to the Department of Energy, Office of Indian Energy and was awarded June 2017.
- SIHA and the Spokane Tribe did partner with an experienced installer SunVest Solar and Grid Alternatives labor subcontractor and the Tribe's energy company (Sovereign Power) to design and build a total 652.5kW solar facilities at 32 Tribal and SIHA buildings. Solar Investors of WI addresses the nonfederal cost share.
- During the project Sovereign Power has gone dormant, meaning that they do not have an Executive Director or any other employees to administer the Tribal business. This is significant because this was the enterprise that agreed to carry on the maintenance of the COSSI Solar project installation after the 4-year warranty period, *I will discuss this in the Lesson Learned section of this report.*
- SIHA Successfully procured and installed solar PV systems, including modules, inverters, wiring, and mounting hardware, according to the technical specifications and safety standards with the contractor Grid Alternatives.
- Testing and commissioning the solar PV systems, verifying their performance and functionality, and providing training to the Spokane Indian Housing Authority staff and tenants on their operation and maintenance.
- Monitoring and evaluating the solar PV systems' energy production, savings, and environmental benefits, and reporting the results to the Spokane Indian Housing Authority and its funding agencies.
- The energy produced in a 12-month period is an average of approximately 700,000kWh.

### **4. Project Impact:**

- Promoting Indian tribal energy development by showcasing the benefits and challenges of solar PV systems as we continue to learn of a developing, growing and changing technology.
- Reducing and stabilizing energy costs for the Spokane Indian Housing Authority and its tenants, which can lead to lower rent, more affordable housing, and higher disposable income for tribal members.
- Enhancing and strengthening Indian tribal energy and economic infrastructure by creating local jobs, increasing energy independence, and reducing greenhouse gas emissions.
- Bringing electric power costs down and reducing the energy burden for Tribally owned buildings and homes for tribal members, which in turn can improve their quality of life, health, education, and cultural preservation.
- The project had a positive effect on family members who live in the residential units. One such story is that one family with children that visited the doctors on a regular basis receiving some of the same surgeries had been impacted by the costs of traveling to the doctors and hospital visits, were at times borrowing money from other family members and friends to make ends meet including utility costs. After saving over \$200 and sometimes \$230 a month on their energy costs, they no longer needed to borrow from family and friends.



**Spokane Tribal Fish Hatchery 100kW**

5. **Lessons Learned** are as follows:

- Project management and coordination was a challenge since this was the first energy project for the Spokane Indian Housing Authority. There were a few challenges in getting to know the process and the stakeholders involved with the project. Communication was not a challenge, but planning the project with the new partners and the process was a challenge but all parties involved seemed to be satisfied with the project and its process. All parties agreed to the negotiated terms of the Tax Credit deals and terms within the Design Build Contract, once the documents were signed the construction began within 6 weeks of the signing.
- SIHA experienced the cost of materials rising during the project for the construction of a new maintenance building, that affected the overall cost of a proposed 4000sq ft maintenance building that was budgeted for \$503,000. During the Covid-19 pandemic prices rose to the point that the building was going to cost an estimated \$1,206,875 so this building was not built and another building was selected and that new selection was the Ford Youth Center located within the New House Lane. This newly selected building needed the environmental review and the structural engineering completed prior to the solar panel system being installed so this caused a delay in the project to the point that SIHA had to ask for a 1-year extension on the project completion date.
- Monitoring the project is and will continue to be a challenge in working with Avista Utilities, a regulated business unit of Avista Corporation headquartered in Spokane, Washington. Being investor-owned is a challenge because they are a for-profit utility and may not want to give into resources having a negative effect

upon their investments. So, asking for and getting reliable utility use reports is a challenge to the reporting requirements of this project. SIHA and the Sub-Contractor, Grid Alternatives, will continue to use the software Solar-Edge to monitor production and this will help with monitoring any power interruptions of the Solar Equipment installed.

- Financial and funding aspects have moved through the project with only a few problems submitting the correct amounts into the reporting documents, this is due to having a turnover in our financial department. The budget was adhered to by the SIHA staff and the contractor and subcontractors. Procurement was not an issue because the contractor and subcontractors purchased all the mechanisms for the solar PV systems.
- Social and cultural aspects, such as community engagement, education, and outreach were covered by our in-house Tenant Services staff and our Maintenance staff and our Weatherization staff.
- As mentioned earlier Sovereign Power, a Spokane Tribal Enterprise has gone dormant, meaning that they do not have an Executive Director or any other employees to administer the Tribal business. This is significant because this was the enterprise that agreed to carry on the maintenance of the COSSI Solar project installation after the 4-year warranty period. SIHA had to redirect and delay some of the maintenance of the installations. SIHA and Grid Alternatives will correct the maintenance within the structure of the SRRSEP/COSSI 2.0 project contract and we will work closely with a local electrical contractor and Grid Alternatives on training an existing employee and/or a project trained installer for maintenance.

#### **6. Description of Activities Performed:**

The COSSI project originally planned to install solar PV on 14 SIHA and Tribal buildings on the Spokane Indian Reservation, but the project had a few hiccups and we had to eliminate one major building selected and that was the Alex Sherwood Memorial Building (Community Center). This removal was due to the poor condition of the roof and the time and expense that it would take to reroof the building. A second building was removed because it was not built in time for the project. This building was the new Maintenance Building, when material costs were beginning to escalate, and it became unaffordable to build the approximately 4000 square foot building. Two other buildings were identified to replace the ones removed. The first is Spokane Tribal Fish Hatchery, where a total of 100 kW solar was installed; the second replacement was the Ford Youth Center with approximately 25 kW solar installed.

Eighteen additional residential buildings were added to the project to make up the difference on the total solar PV to be installed. The additional 18 residential buildings were 10 senior duplexes and 8 Low Income Housing Tax Credit (LIHTC) homes built in 2013 with new asphalt shingle roofs. The senior units that were added to the project had new standing seam metal roofing installed in 2013 and were solar ready for this project. *(A list of the buildings will be attached to the project final report)*

*The information below provides details on the approach and organization for managing the work and roles of each Project Team Member.*

- The SIHA Executive Director and Business Contact for the grant (Grant), will oversee Project administration.



- The SIHA Weatherization Program Manager and Technical Contact, managed the Project, including working with the Tribal Energy Entity in identifying the most appropriate Tribal members to be trained and work on the installation, and overseeing the Contracts and Labor Subcontractor's work and the O&M of the facilities.
- The Installation Contractors and Labor Subcontractors were responsible for the designing, installing, commissioning and initial (O&M) of the solar facilities.
- The Labor Subcontractor, working under the Installer's direction installed the Project working with Tribal members identified by the Tribal Energy Entity and trained and overseen by the Labor Subcontractor. The Investor was responsible for providing the non-federal cost share to the project.

*Critical hand-off mutuality among Project team members throughout the Project include:*

- The Tribe and SIHA did form a limited liability company (LLC) with the Investor, under which the Tribe and SIHA will be an owner member and specifically be able to exercise authority, direction and control over the design and building of the Project.
  - The LLC and Installer entered a Design-Build (D-B) contract with provisions to ensure Tribe/SIHA's protection, including compliance with all DOE requirements.
  - The Tribe issued permits for Project installation and operation on Indian Lands, subjecting the Project's design, construction, and O&M to the Tribe's jurisdictional authority, direction, and control.
  - The Tribe and SIHA entered into a Power Purchase Agreement (PPA) with LLC that provided them additional authority, direction, and control over the Project operation, including requirements that the facilities can serve only the designated buildings under the Grant agreement.
  - The operating agreement (OA) did provide Tribe/SIHA full credit for the Grant and the value of the tax credits received by Investor. The OA will also provide that once the remaining amount due to Investor has been paid (i.e., its investment, minus both the tax credits and the small amount that Investor is entitled to receive for leaving LLC), any income to the LLC will be distributed to Tribe/SIHA. When that occurs, the PPA will also provide for energy payments to be reduced to a nominal amount.
- Combined with Tribe's/SIHA's ability to purchase Investor's interest in LLC or the facilities with the assumed condition that the Tribe can require solar facilities to be removed, and this allows Tribe/SIHA to ensure the Investor's exit and the Tribe's full ownership of the facilities.
- Regarding project risk management and quality assurance/quality control, to limit Project and cost risk, SIHA has obtained commitments from the Installer and Labor Subcontractor and has talked to the local utility to confirm that there should be no installation, interconnection, or net metering issues. To manage and limit any risks associated with the installation, SIHA has required the Installer to commit to the price set forth in the Grant application, to provide a 5-year parts and labor warranty on the solar facilities, and to pass through all the warranties provided by the equipment manufacturers. The Labor Subcontractor is uniquely skilled to provide significant training and oversight to Tribal members to allow them to work on the Project and gain valuable employment skills during and can be used after the project is complete.

**Conclusions and Recommendations:** This Project sparked the interest of the Spokane Tribe in wanting to focus on developing an Energy Group that would focus on Tribal energy development and goals. Look for sources to encourage energy efficiency in homes and in Public Tribal Buildings use less energy by reducing waste and fossil

fuels and stabilizing energy costs for Tribal Residences and Tribal Businesses alike. Shortly after installing the Solar on Tribal Building and Homes the Spokane Indian Housing Authority and other interested parties began developing a Microgrid Study for the Spokane Indian Housing Authority and their surrounding buildings, Tribal Senior Center, Senior Housing Units, Force Account/Weatherization Building, and the Tribal Long House. These buildings exist within a quarter mile from each other. The study received the attention from the local electrical utility company, and they now want to assist in the project and look at funding a second microgrid. The Tribe and Avista applied for a Washington State, "Grid Modernization Grant" and this was successful. Discussion is moving forward on the location for the second microgrid project. Now the Tribal Business Council has started a new energy group focused on clean energy.

As a result of this project the interest in alternative energy resources from the Tribal Leadership has grown. Since the beginning of the project appearance in 2018 a few other projects have resulted in new developments here is a short list.

- a) Micro grid Study for the Spokane Indian Housing Authority, the study fostered a grant from the Washington State Department of Commerce to build the micro grid on the SIHA campus site, we are hoping to find additional funding to have the Senior Homes connected to the micro grid to alleviate their worries during a grid power outage.
- b) Avista Utilities and the Spokane Tribe is working on a second micro grid location and how it could impact the Tribe's Administration Building and other buildings that provide needed services for the Reservation.
- c) The Spokane Reservation Residential Solar Energy Project (SRRSEP) is a project that stemmed from the original COSSI project, SRRSEP will have solar installations on 119 SIHA managed low-income rental homes.



**Senior Housing Units 12 Homes with varied kW sizes 5.4kW – 6.6kW**

**Conclusion:**

The Spokane Indian Housing Authority and the Spokane Tribe could not have successfully completed the “Children of The Sun Solar Initiative” project without having a structured program beginning with:

- 1- Department of Energy, Office of Indian Energy;** that set aside funding for Tribes and Tribal Organizations, help coach the Stake Holders with the setting up the project documents and contracts that make these projects all across the country a success. Special Thanks to:  
**Lizana K. Pierce**, DOE Deployment Supervisor and Project Officer  
**Tweedie Doe**, Project Officer. US DOE Office of Indian Energy  
**Jami Alley**, Principal Engineer/Technical Project Monitor, Project Monitor
- 2- SunVest Solar** a solar company willing to invest into projects in Indian Country to help make this project and others like it a success, it was very nice to work with **Kirk Kindred**, National Sales Director, SunVest Solar.
- 3- GRID Alternatives** a Solar installation company, with a Native Division working in Indian country and successfully installing thousands of PV systems for Tribes. But they also provide installation training for local Tribal workers, that require safety training and training to maintain the systems for Tribal Organizations **Tim Willink**, Director of Tribal Programs, GRID Alternatives.
- 4- Godfrey & Kahn**, Law Office, Madison, Wisconsin; The company were an excellent guide in navigating the legal and contract documents for all the stake holders involved with our project. We especially appreciate the hard work of: **John Clancy Attorney**, and his staff in Madison, Wisconsin.

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## COSSI Buildings Solar Installation and Production for 1 year

Building Name	Spokane Indian Housing Authority & Spokane Tribal Buildings Addresses	kW installed	Production Year	12 month Energy Production	\$ Value
Building #1		kW	MM/YY	kWh	
SIHA Admin Building	6403 Sherwood Addition Wellpinit, WA	28.2	1/2020 -12/2020	32819.23	\$3,281.92
Force Account Building	6404 Sherwood Addition Wellpinit, WA	19.2	1/2020 -12/2020	25720.81	\$2,572.08
Ford Youth Center (NHL)	5064 Seyler Way, Ford WA 99013	20.8	7/2022 - 5/2023	21983.22	\$2,198.22
Senior Housing 7R	6401 Sherwood Addition Wellpinit, WA	6	1/2021 -12/2021	7136.19	\$642.25
Senior Housing 7L	6401 Sherwood Addition Wellpinit, WA	6	1/2021 -12/2021	6252.51	\$562.72
Senior Housing 6R	6401 Sherwood Addition Wellpinit, WA	6.6	1/2021 -12/2021	8568.78	771.19
Senior Housing 5R	6401 Sherwood Addition Wellpinit, WA	5.7	1/2021 -12/2021	6915.96	\$622.43
Senior Housing 5L	6401 Sherwood Addition Wellpinit, WA	5.7	1/2020 -12/2020	6801.27	\$612.11
Senior Housing 4R	6401 Sherwood Addition Wellpinit, WA	5.4	1/2020 -12/2020	6934.36	\$624.09
Senior Housing 4L	6401 Sherwood Addition Wellpinit, WA	5.7	1/2021 -12/2021	7003.29	\$630.29
Senior Housing 2L	6401 Sherwood Addition Wellpinit, WA	5.4	1/2021 -12/2021	1414.46	\$127.30
Senior Housing 2R	6401 Sherwood Addition Wellpinit, WA	5.4	1/2021 -12/2021	7685.31	\$691.67
Senior Housing 3L	6401 Sherwood Addition Wellpinit, WA	5.4	1/2021 -12/2021	\$650.77	\$650.77
Senior Housing 3R	6401 Sherwood Addition Wellpinit, WA	5.4	1/2021 -12/2021	6933.23	\$623.99
Long House	6386 Sherwood Loop Wellpinit, WA	23.4	1/2020 -12/2020	24709.18	\$2,470.91
Senior Center	6403B Sherwood Loop Rd, Wellpinit, WA	29.4	1/2020 -12/2020	34015.65	\$3,401.56
Spokane Tribe Admin (McCoy)	6195 Ford-Wellpinit Rd, Wellpinit, WA	129.6	1/2020 -12/2020	98972.47	\$9,897.24
Tribal Fish Hatchery	5629 Hatchery Rd, Ford, WA 99013	129.6	1/2020 -12/2020	145453.25	\$14,545.33
Public Safety	6203A Ford Wellpinit, WA	46.8	1/2021 -12/2021	64639.451	\$6,463.94
West End Community Center	6421 Selena Ct Bldg Community Center, Fruitland, WA 99129	29.7	1/2021 -12/2021	33708.581	\$3,370.85
Sockeye House 2	5638 Sockeye St, Wellpinit WA 99040	12.3	1/2020 -12/2020	12386.419	\$1,114.77
*Sockeye House 6	5623 Sockeye St, Wellpinit WA 99040	12.3	1/2021 -12/2021	14219.554	\$1,279.76
Sockeye House 7	5627 Sockeye St, Wellpinit WA 99040	12.3	1/2021 -12/2021	15834.65	\$1,425.11
*Sockeye House 9	5635 Sockeye St, Wellpinit WA 99040	12.3	1/2021 -12/2021	15563.885	\$1,400.75
Sockeye House 4	5632 Sockeye St, Wellpinit WA 99040	7.5	1/2021 -12/2021	9383.823	\$844.54
Sockeye House 8	5629 Sockeye St, Wellpinit WA 99040	7.5	1/2021 -12/2021	9986.215	\$898.75
5098 Tshimakian Way Loop	5098 Tshimakian Way Loop, Ford, WA 99013	12.3	1/2021 -12/2021	14834.111	\$1,335.07
5085 Tshimakian Way Loop	5085 Tshimakian Way Loop, Ford, WA 99013	12.3	1/2020 -12/2020	8655.104	\$778.95
5081 Tshimakian Way Loop	5081 Tshimakian Way Loop, Ford, WA 99013	7.5	1/2021 -12/2021	10049.743	\$904.47
5077 Little Spokane Way	5077 Little Spokane Way, Ford, WA 99013	12.3	1/2021 -12/2021	14881.02	\$1,339.29
5081 Little Spokane Way	5081 Little Spokane Way, Ford, WA 99013	12.3	1/2020 -12/2020	13697.889	\$1,232.81
5083 Little Spokane Way	5083 Little Spokane Way, Ford, WA 99013	12.3	1/2020 -12/2020	9940.014	\$894.60
TOTAL		652.6		697750.399	\$68,209.73

