Exhibit A

PCCO #001

Main Office
PO Box 967
Missoula, Montana 59806
Phone: (406) 542-9150
Fax: (406) 542-3515

Project: 01202520 - Broadway Building Remodel Missoula Water
1345 W Broadway St
Missoula, Montana 59802

Prime Contract Change Order #001: MSLA Water Building - PV System

TO:		**FROM:**	
DATE CREATED:	12/ 02 /2025	**CREATED BY:**	Jeff Scott **(Jackson Contractor Group, Inc.)**
CONTRACT STATUS:	Pending - In Review	**REVISION:**	0
DESIGNATED REVIEWER:		**REVIEWED BY:**	
DUE DATE:		**REVIEW DATE:**	
INVOICED DATE:		**PAID DATE:**	
SCHEDULE IMPACT:		**EXECUTED:**	No
CONTRACT FOR:	01202520-00:Broadway Bldg Msla Water	**TOTAL AMOUNT:**	$ 410,813.00
DESCRIPTION:			
ATTACHMENTS:			

This proposal is based on the usual cost elements such as labor, material, and normal mark ups, and does not include any amount for changes in the sequence or work delays, disruption, rescheduling, extended overhead, acceleration and or impacts, and the right is expressly reserved to make claim for any and all of these related items of cost prior to any final settlement of the contract.

POTENTIAL CHANGE ORDERS IN THIS CHANGE ORDER:

PCO #	Title	Schedule Impact	Amount
001	GMAX #1 - PV System - On Site Energy		410,813.00
		TOTAL:	**$410,813.00**

CHANGE ORDER LINE ITEMS:

PCO # 001 : GMAX #1 - PV System - On Site Energy

#	SubJob	Cost Code	Description	Type	Amount
1	N/A	26-0002 - ELECTRICAL COMPLETE	Solar Panels	Subcontract	$ 373,099.00
2	N/A	01-3120 - PROJECT MANAGER	General Conditions	Labor - Salaries/Wages	$ 840.00
				Subtotal:	$373,939.00
				Contractor Contingency: 2.00% Applies to All Line Items	7,462.00
				GL Insurance: ≈ 0.85% Applies to All Line Items	3,242.00
				BR Insurance: 1.00% Applies to All Line Items	3,846.00
				Procore: ≈ 0.19% Applies to All Line Items	742.00
				CM Fee: ≈ 4.5% Applies to All Line Items	17,515.00
				GRT : 1.00% Applies to All Line Items	4,067.00
				Grand Total:	**$410,813.00**

The original (Contract Sum)	$ 0.00
Net change by previously authorized Change Orders	$ 0.00
The contract sum prior to this Change Order was	$ 0.00
The contract sum would be changed by this Change Order in the amount of	$ 410,813.00
The new contract sum including this Change Order will be	$ 410,813.00

The contract time will not be changed by this Change Order

Jackson
CONTRACTOR GROUP, INC.

PCCO #001

SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE

PCO #001

Main Office
PO Box 967
Missoula, Montana 59806
Phone: (406) 542-9150
Fax: (406) 542-3515

Project: 01202520 - Broadway Building Remodel Missoula Water
1345 W Broadway St
Missoula, Montana 59802

Prime Contract Potential Change Order #001: GMAX #1 - PV System - On Site Energy

TO:		**FROM:**	
PCO NUMBER/REVISION:	001 / 0	**CONTRACT:**	01202520-00 - Broadway Bldg Msla Water
REQUEST RECEIVED FROM:		**CREATED BY:**	Jeff Scott **(Jackson Contractor Group, Inc.)**
STATUS:	Pending - In Review	**CREATED DATE:**	12/2 /2025
REFERENCE:		**PRIME CONTRACT CHANGE ORDER:**	#001 - MSLA Water Building - PV System
FIELD CHANGE:	No		
LOCATION:		**ACCOUNTING METHOD:**	Amount Based
SCHEDULE IMPACT:		**PAID IN FULL:**	No
		TOTAL AMOUNT:	$410,813.00

POTENTIAL CHANGE ORDER TITLE: GMAX #1 - PV System - On Site Energy

CHANGE REASON: Client Request

POTENTIAL CHANGE ORDER DESCRIPTION: *(The Contract Is Changed As Follows)*

- Gmax #1 includes the complete supply and installation of a 50 kW photovoltaic (PV) system for the existing Missoula Water Building and a complete supply and installation of a 50 kW photovoltaic (PV) system for the future Truck Barn.
- To preserve eligibility for the 48E Investment Tax Credit under current rules, the City with Jackson Contracting Group and On Site Energy intends to satisfy the IRS 5% Safe Harbor Test before December 31, 2025. This proposal outlines a path to safe harbor by purchasing a portion of the solar modules in 2025, with title transferred to Jackson Contractor Group prior to year-end.
- To secure the 48E Investment Tax Credit under current IRS rules, OnSite Energy recommends that the City purchase 100 solar modules for each project prior to December 31, 2025. Purchasing this portion of the total equipment serves two important purposes. First, it represents approximately 10% of the total project cost, which is the threshold we recommend to confidently satisfy the 5% Safe Harbor Test and preserve eligibility for the current credit value. Second, these modules will be held in On-Site Energy's warehouse, ensuring that the equipment is fully under our control at the time of purchase should the City require contractor possession as part of its procurement process. Additional modules needed for full system construction will be procured and delivered during the build phase, but the initial purchase of 100 modules per project is sufficient to establish safe harbor for both systems.
- See On Site Energy proposal for additional inclusions and exclusions as well as the proposed system layouts.

Assumptions/Clarifications:

- Storage of solar modules will be by On-Site Energy
- Offload and handling of solar modules will be by On-Site Energy
- Gmax #1 Includes the following:

- Construction Contingency
- General Liability and Builders Risk Insurance
- Procore and Contractor Fee
- 1% Gross Receipt Tax

Exclusions:

- Escalation

This proposal is based on the usual cost elements such as labor, material, and normal mark ups, and does not include any amount for changes in the sequence or work delays, disruption, rescheduling, extended overhead, acceleration and or impacts, and the right is expressly reserved to make claim for any and all of these related items of cost prior to any final settlement of the contract.

ATTACHMENTS:

#	SubJob	Cost Code	Description	Type	Amount
1	N/A	26-0002 - ELECTRICAL COMPLETE	Solar Panels	Subcontract	$ 373,099.00
2	N/A	01-3120 - PROJECT MANAGER	General Conditions	Labor - Salaries/Wages	$ 840.00
				Subtotal:	$373,939.00
				Contractor Contingency: 2.00% Applies to All Line Items	$ 7,462.00
				GL Insurance: ≈ 0.85% Applies to All Line Items	$ 3,242.00
				BR Insurance: 1.00% Applies to All Line Items	$ 3,846.00
				Procore: ≈ 0.19% Applies to All Line Items	$ 742.00
				CM Fee: ≈ 4.5% Applies to All Line Items	$ 17,515.00
				GRT : 1.00% Applies to All Line Items	$ 4,067.00
				Grand Total:	**$410,813.00**

SIGNATURE **DATE** **SIGNATURE** **DATE** **SIGNATURE** **DATE**

GMAX #1 - COST SUMMARY - MISSOULA WATER BUILDING - PV SYSTEM

Bid Item	Description	Base Bid	Recommended Subcontractor
1.0	PV System Complete - Water Building	$ 183,091	On-Site Energy
2.0	PV System Complete - Truck Barn	$ 190,008	On-Site Energy
	Subtotal of Base Bid Items =	**$ 373,099**	

GR #	General Requirements (See GRs)	Total	Notes
GR-01	Storage of PV Panels - By On Site Energy		By On Site Energy
GR-02	Offload and Storage Support - By On Site Energy		By On Site Energy
	Subtotal of General Requirements =	**$ -**	

Total Cost of Construction =	**$ 373,099**

General Conditions	Total	Notes
Contractor Contingency	**$ 7,462**	2.00%
Subtotal	$ 380,561	
General Conditions	**$ 840**	8 Hour s for Contracting and Purchasing
Subtotal	$ 381,401	
GL Insurance	**$ 3,242**	0.850%
Subtotal	$ 384,643	
BR Insurance	**$ 3,846**	1.000%
Subtotal	$ 388,489	
Procore	**$ 742**	0.191%
Subtotal	$ 389,231	
Construction Management Fee	**$ 17,515**	4.50%
Subtotal	$ 406,747	
Gross Receipts Tax	**$ 4,067**	1.00%
Subtotal	$ 410,814	

TOTAL BID PKG #1 COST =	**$410,813**

(406) 551-6135
1515 N. Rouse Ave
Bozeman, MT 5971

December 1, 2025

To the City of Missoula Water Building OAC team:

On behalf of OnSite Energy, we are pleased to submit this proposal for the design and installation of two net-metered solar PV systems: one serving the existing Water Building and one serving the proposed Truck Barn. Building on our previous feasibility work with Missoula Water and informed by the project team's structural, mechanical, and electrical evaluations, this proposal outlines a clear pathway toward implementing solar as part of the larger Renovation Project.

With 13+ years of experience delivering on-time, on-budget commercial and municipal solar projects across Montana—including the Missoula County Detention Facility and the Missoula Wastewater Treatment Plant—OnSite Energy is well positioned to support the City and its design and construction team through design, safe harbor procurement, and construction of PV arrays.

We appreciate the opportunity to contribute to the City's long-term energy resilience and sustainability goals.

Sincerely,

Blake Bjornson
Commercial Solar Developer, OnSite Energy

Table of Contents

1. Proposal

Overview

OnSite Energy has engaged with the City of Missoula, A&E Architects and Jackson Contractor Group to evaluate solar PV for the existing Water Building at 1345 West Broadway and for a proposed Truck Barn on the same property. During discussions with the team, it was determined that the optimal approach for the City of Missoula is to evaluate construction of two separate net-metered PV systems, one on each building.

To preserve eligibility for the 48E Investment Tax Credit under current rules, the City intends to satisfy the IRS 5% Safe Harbor Test before December 31, 2025. This proposal outlines a clear path to safe harbor by purchasing a portion of the solar modules in 2025, with title transferred to Jackson Contracting prior to year-end.

Estimated System Sizes (Preliminary)

Building	System Size (DC)	System Size (AC)	Est. Year-1 Production (Preliminary)
Water Building	81.4 kW	50 kW	~92,000 kWh
Truck Barn	84.7 kW	50 kW	~96,000 kWh

Final sizing will be refined following structural completion, updated mechanical layouts, and electrical service design.

To secure the 48E Investment Tax Credit under current IRS rules, OnSite Energy recommends that the City purchase 100 solar modules for each project prior to December 31, 2025. Purchasing this portion of the total equipment serves two important purposes. First, it represents approximately 10% of the total project cost, which is the threshold we recommend to confidently satisfy the 5% Safe Harbor Test and preserve eligibility for the current credit value. Second, these modules will be held in OnSite Energy's warehouse, ensuring that the equipment is fully under our control at the time of purchase should the City require contractor possession as part of its procurement process. Additional modules needed for full system construction will be procured and delivered during the build phase, but the initial purchase of 100 modules per project is sufficient to establish safe harbor for both systems.

Appendix A includes cost estimates for both projects and splits out the safe harbor purchase of modules from the remainder for the project.

Design Philosophy

Our approach for both buildings is based on:

- **Assumes separate electrical services and PV arrays** to simplify NWE approval and maximize total net-metering eligibility.
- **Avoiding the Water Building's barrel roof**, per structural engineering guidance.
- **Coordinating PV layout with mechanical and electrical equipment zones**, including new HVAC placements.
- **Creating a design flexible enough** to proceed with safe harbor before inverter selection or full engineering is completed.
- **Selecting universal, future-proof equipment** so the PV modules purchased in 2025 remain compatible even after additional design refinements.

- **Potential Value Engineering**: The Truck Barn may qualify for UL-3741 compliance, eliminating the need for module-level Rapid Shutdown Devices if array boundaries, pathways, and setbacks allow. This will be evaluated during detailed design.

Proposed System Layouts

Preliminary layouts for both buildings are included on the next pages and will be refined based on structural analysis, final equipment locations, and detailed electrical design.

Figure 1: Water Building Preliminary Layout

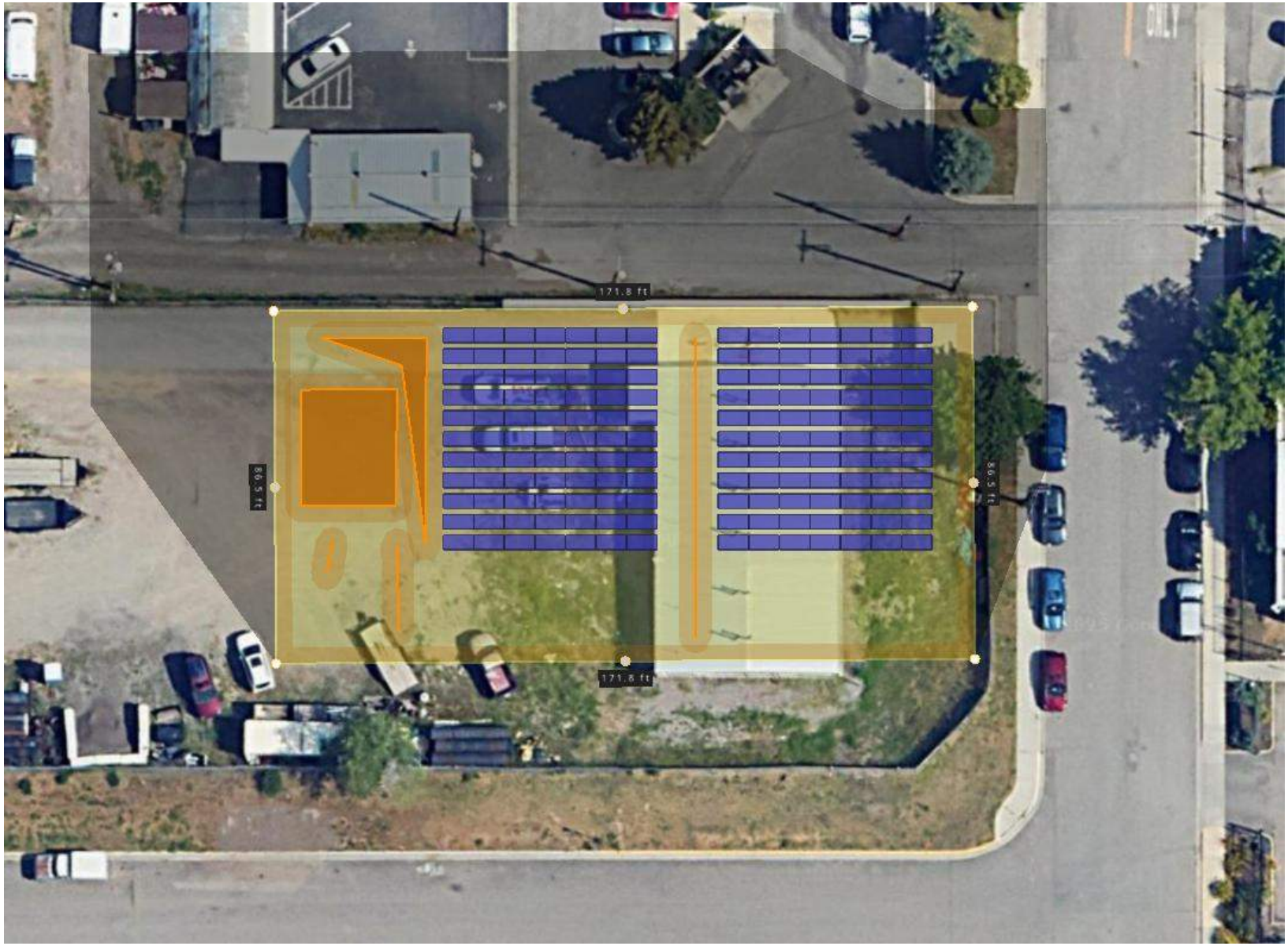


Figure 2: Truck Barn Preliminary Layout

System Specifications

The projects are designed with the following equipment specifications. See **Appendix B: Equipment Spec Sheets** for more information. Specifications subject to change depending on lead time and availability.

PV Modules

- Make/Model: Aptos DNA 144-Bifacial Dual Glass – 550W
- Module Efficiency: 21.29%
- Warranty: 30-year product, 30-year power performance

Inverters

- Make: SolarEdge SE50KUS
- Power Output: 50 kW at 208V
- Inverter Efficiency: 97% CEC
- Warranty: 12 years, extendable to 20 years

Racking

Flat Roof

- Make/Model: Unirac GridFlex 10
- Tilt: 10-degree tilt ballast
- Warranty: 25 years

Flush-Mount

- Make/Model: IronRidge Aire
- Warranty: 25 years

Assumptions and Inclusions/Exclusions

Inclusions

- Racking Layout/Structural
    - Water Building Structural: For flat-roof areas, assumes use of Unirac GridFlex 10 (or similar) with a mix of mechanical attachments and ballast blocks. The racking design will be finalized in conjunction with the structural analysis to determine the appropriate mix of attachments and ballasts.

      It is assumed a flush-mount racking system can be installed on the pitched roof on the southern portion of the Water Building.

    - Truck Barn: It is assumed the roof will be structurally capable of hosting a fully-ballasted array using the Unirac GridFlex 10 (or similar)
- Pricing includes limited roof flashings of mechanical attachments for the Water Building. Slipsheets underneath solar array are not included.
- City of Missoula permitting is included.
- Northwestern Energy interconnection applications and net metering requests are included.
- Gross Receipts Tax, as required for public projects in Montana, is included.
- Construction labor paid at Montana Prevailing Wage Rates, as required for public projects in Montana.

Exclusions

- Structural stamps are excluded. It is assumed the structural evaluation and stamped letter will be provided by the Engineer of Record.
- Hard-wired network connections to the inverters for remote monitoring are not included.
- Project bonding is not included.

2. Estimated Energy Production

OnSite Energy has modeled the energy production of the proposed projects using HelioScope, a state-of-the-art production modeling software. This analysis accounts for shading, snow, and other site-specific conditions.

Building	**System Size (**kW **DC)**	**System Size (**kW **AC)**	**Est. Year-1 Production (kWh)**	**Specific Yield (kWh/kW)**
Water Building	81.4	50	91,250	1,121
Truck Barn	84.7	50	94,480	1,116

These estimates are validated by comparing them to similar 10-degree tilt solar PV systems installed by OnSite Energy across Montana, confirming its relative accuracy. It is also important to note that annual energy production can fluctuate by ±10% due to weather variations.

For additional details, please refer to **Appendix C: HelioScope Production Report**.

3. Company Overview

Locally Owned & Operated
Founded in 2012, OnSite is a Montana-based solar company with offices in Bozeman and Missoula, dedicated to serving local businesses and homeowners.

Certified & Experienced Team
OnSite Energy holds certifications from the North American Board of Certified Energy Practitioners (NABCEP) and is a qualified installer for Northwestern Energy, guaranteeing expertise and professionalism.

Custom, High-Quality Solutions
We specialize in tailored solar PV and battery energy storage systems (ESS), designed to meet each client's unique energy needs and long-term goals.

Comprehensive Services
Our team handles site analysis, design, project development, installation and ongoing maintenance, ensuring a seamless solar experience.

Trusted Montana Solar Leader
With over a decade of experience and more than 800 completed projects, OnSite Energy has built a strong reputation for delivering efficient, reliable, and cost-effective solar solutions across the Big Sky state.

Committed to Sustainability & Community
As a certified B-Corporation and member of the Amicus Solar Cooperative, we prioritize ethical business practices, environmental responsibility and local economic impact. We regularly donate a portion of our proceeds to local organizations through our Solar for Conservation program.

Certified B Corporation

Solar for Conservation – OnSite Energy

NABCEP Certified PV Installation Professional

Certified AMICUS Member

Project Experience of Similar Scope and Complexity

Montana State University—Norm Asbjornson Hall
System Capacity: 217 kW
Location: Montana State University Campus, Bozeman MT
System Type: Grid Connected Non-Export
Date Commissioned: December 6th, 2018

OnSite Energy provided a high-quality design/build solution for this unique solar PV system with various challenges in terms of physical layout and design. Because of the complex layout including multiple sub arrays, two SolarEdge 100k Commercial Three Phase inverters with DC-to-DC optimizers were chosen to allow for increased layout flexibility, shade mitigation, and overall system safety and reliability. The array consists of 722 300-watt modules mounted at a 10-degree tilt on a tilt mount racking system. The 10-degree tilt allows for least possible interrow shading, and the system is estimated to produce 252 MWh/year.

Missoula County Detention Facility
System Capacity: 432 kW
Location: Missoula County Detention Facility, Missoula MT
System Type: Grid Connected Non-Export
Date Commissioned: 2021

In partnership with Saroc Energy, we were excited to develop, design and build this project for Missoula County and to help them towards their goal of carbon neutrality. With a large flat roof and the highest energy demand of any county building, the detention center was a good candidate for a large-scale non-export solar array. At 432 kW, it is currently the largest rooftop solar system in the state and estimated to produce 475,189 kWh/year, offsetting approximately 20% of the facility's electricity use.

Qualifications

- Montana State Contractors License #207887
- Montana State Electrical Contractors License #59387
- NABCEP Certified Solar PV Professionals on staff
- NorthWestern Energy Qualified Renewable Energy Installer

Experience and Capabilities

Founded in 2012, OnSite Energy was established by Orion Thornton and Conor Darby, both solar industry veterans since the mid-2000s. After managing the Bozeman branch of a multi-state solar company, they set out to build a locally rooted, innovation-driven business dedicated to Montana's long-term energy future.

Today, OnSite Energy is Montana's largest solar PV contractor, with a team of 35+ professionals and a strong track record of delivering some of the state's most notable and technically complex solar installations.

Key Highlights:

- 800+ Solar PV Projects Installed across Montana, totaling over 13 megawatts (MW) of DC capacity.
- Completed several of Montana's largest solar installations, including:
    - GSK Hamilton – 820 kW
    - Missoula Wastewater Treatment Plant – 545 kW
    - Missoula County Detention Facility – 432 kW
- Successfully delivered five solar PV projects for Montana universities and colleges, including a 217-kW system at Montana State University's Norm Asbjornson Building.
- OnSite Energy has maintained a strong working relationship with NorthWestern Energy since 2005, including participation in the USB grant program and multiple design/build contracts. Our team was selected for NorthWestern's 386 kW Bozeman Solar Project in 2016, and we continue to support the utility through a Master Services Agreement covering solar-plus-storage pilot projects.
- Industry Leading 15-Year Installation Warranty.
- Dedicated installation/service manager with the ability to respond to O&M calls within 24 hours.
- Written, implemented, and documented company Safety Plan.

For more information, please visit www.OnSiteEnergyInc.com.

OUR LEADERSHIP

Conor Darby CEO & Partner

With over 19 years of solar industry experience, Conor's expertise spans the commercial, industrial, and residential market segments. He has designed, managed, and commissioned over 500 electrical systems. Alongside his technical achievements, Conor has played a key role in OnSite Energy's growth and market development. He served as general manager at Independent Power Systems (2004-2011) and was President of the Montana Renewable Energy Association (2010-2016). Conor holds a degree in Environmental Economics from Middlebury College and continues to drive renewable energy progress in Montana.

Orion Thornton CTO & Partner

Orion has been a passionate advocate for Montana's solar energy sector since 2002, when he began building his own wind and solar systems. A Montana native raised off-grid, Orion's early interest in self-sufficiency and alternative energy laid the groundwork for his career. He earned an A.A.S. degree in Photovoltaic Design and Installation from San Juan College in 2006 and was soon hired as a System Designer at Independent Power. Orion has served on the board of the Montana Renewable Energy Association (2014-2019) and has committed to a lifetime of promoting and implement renewable energy solutions.

Matt Rounds Director of Operations

Matt brings over 10 years of experience in engineering, construction, and operations development in Montana. His passion for lifelong learning, small business growth, and conservation led him to join OnSite Energy. Starting his career as a Mechanical Engineer, Matt designed cryogenic systems, self-driving cars, and CNC machines before transitioning to operations roles. At OnSite Energy, Matt focuses on streamlining processes, coordinating resources, and improving efficiency to enhance the experience for customers and employees alike. Matt holds a B.S. in Mechanical Engineering from the University of North Carolina at Charlotte.

OUR PROJECT TEAM

Blake Bjornson Commercial Solar Developer

Blake joined OnSite in 2024 as a Commercial Solar Developer to focus his energy on developing solar in his home state and working with a local team. He is passionate about low-carbon energy and putting the power in the hands of the people with distributed energy resources. Blake's interest in renewables began as an engineering student at Montana State University where he was deeply involved in sustainability efforts, including the creation of the MSU Sustainability Office and the Smart Building Initiative. After college, he spent eight years as a project developer in utility-scale development, managing all aspects of pre-construction development for large projects across the West.

Keith Wickman Senior Project Manager

Keith's passion for renewable energy began during his studies at Montana State University, where he earned a B.S. in Construction Engineering Technology. After graduating, he gained hands-on experience installing solar before relocating to Washington to continue his work in the field. Now back in Montana, Keith is focused on advancing solar energy adoption to help preserve the state's natural resources. Keith is skilled in project scheduling, contract management, and client relations to ensure projects run smoothly.

David Kirk Lead Solar Designer

David is a native of Billings, Montana and brings a deep commitment to distributed energy resources and their role in keeping Montana clean and vibrant. His background spans HVAC&R research and utility-scale wind and solar installations. Prior to joining OnSite Energy, David worked with a civil contractor on large-scale renewable energy projects. With both a B.S. and M.S. in Mechanical Engineering from Montana State University, David's education combined with his strong personal passion makes him an invaluable member of the team.

Safety Qualifications

Partner-owners Orion Thornton and Conor Darby founded the Montana Renewable Energy Association safety committee in 2008, and have each served terms as committee chair. In 2008 they formed a strategic alliance between the MREA and OSHA, signing a partnership document with officials from OSHA's Billings Area Office. The main goal was to work with OSHA as an informational resource to analyze hazards and risks prevalent on renewable energy jobsites, and in turn to consolidate safety content for the MREA member businesses' Safety Programs.

Building upon the resources of the MREA-OSHA Safety Alliance, Onsite Energy has developed and established its own Safety Program, which is defined in a document referred to as the company's Safety Plan. The Safety Plan is a tool that is used by the company on a regular basis, and has been provided to other contractors, clients, and insurance agencies alike.

In summary, the plan includes but is not limited to: the company's safety policy statement, the definition of the safety responsibilities of the company, its employees, and subcontractors; safety meeting schedules, new employee training, workplace inspections, accident investigating and reporting, and a *Hazard Communication Program* which entails risk identification and mitigation of the '4 Focus Hazards' commonly found at jobsites.

For reference, provided here is an excerpt from the Onsite Energy *Safety Policy Statement:*

> Our company is dedicated to the promotion of safety in the workplace. It is our policy to provide a safe and healthy place of employment for all employees. Personnel and entities affiliated with this company will adhere to the safety rules, policies and program elements issued in conjunction with this policy statement and outlined within this written program. Failure to do so may result in disciplinary action for employees and termination of contract for suppliers and subcontractors. Visitors and customers are also expected to follow all applicable safety rules and policies.
> Every effort will be made to comply with state and federal guidelines in order to assure the safest workplace possible for the employees. In return, employees are required to exercise common sense in regard to safety and to report all unsafe acts, operations, conditions and any accident to the appropriate person(s). All hazardous or potentially hazardous situations will be eliminated before work is conducted.
> We also realize that the responsibility for promoting safety in the workplace must be equally shared by all members of the organization. Management accepts the responsibility for developing, implementing and improving safety policies in the workplace. Supervisors and employees are equally responsible and are expected to develop the proper attitude toward safety and health. Everyone is responsible for ensuring that all operations are conducted with the utmost regard to health and safety.
>
> Management gives its full support to all personnel who enforce and apply these policies in the workplace.

Appendix A: Pricing Estimates

Onsite Energy, Inc.

1515 N. Rouse Ave.
Bozeman, MT 59715
(406) 551-6135
accounting@onsiteenergyinc.com

Estimate

ADDRESS
Missoula Water Building
5800 Hwy 93
Missoula, MT 59804

ESTIMATE 3164
DATE 12/01/2025

ACTIVITY	AMOUNT

Design and installation of a 81.4 kW DC / 50 kW AC roof-mounted solar PV system at the City of Missoula Water Building in Missoula, MT, including all equipment, labor, and electrical scope necessary for a complete and code-compliant installation.

This is a good faith estimate based on preliminary site information and design.

Pricing reflects current material costs and are subject to change due to external factors beyond our control, including the implementation of tariffs.

Equipment subject to change to similar make/model depending on final design and availability.

Design Services Includes necessary design and engineering services to produce a permit-ready solar PV construction plan set, including coordination with and approval from relevant stakeholders. Excludes structural engineering review and stamp. Pricing assumes the Engineer of Record will provide structural analysis and any required stamped letters.	3,384.00
Subtotal:	3,384.00

Solar Electric System All necessary solar equipment as outlined below:	
Solar Modules Safe Harbor Cost Incursion: Aptos 550W modules (QTY 100)	19,900.00
Solar Modules Aptos 550W modules (QTY 48) - Additional for full system size	9,552.00
Inverter SolarEdge 50kW, 208V Inverter (QTY 1), including monitoring capabilities and SolarEdge commercial power optimizers (QTY 148), or similar.	18,819.00
Racking Unirac GridFlex 10 ballasted racking system with U-Anchor attachments and IronRidge Aire on the pitched roof section of the building, or similar	27,290.00
Electrical Materials Electrical Materials, DC wire, junction boxes and miscellaneous equipment.	18,652.00
Subtotal:	94,213.00

Project Labor	
Construction Labor	80,477.00

All necessary labor to install and commission the project including the following:
-- project management and admin, shop prep, solar array installation, inverter installation, electrical installation, commissioning and start-up and a customer walk-through.

Includes prevailing wages for construction labor.

Subtotal: 80,477.00

Project Fees 5,017.00

Project fees cover all associated soft costs and support services necessary for successful project delivery, including the following: --Northwestern Energy Interconnection Application Fee
--Permitting
--Equipment Rental
--Gross Receipts Tax

Subtotal: 5,017.00

Exclusions:
-- Any required structural upgrades if required.
-- Bonding

TOTAL **$183,091.00**

Accepted By

Accepted Date

Onsite Energy, Inc.

1515 N. Rouse Ave.
Bozeman, MT 59715
(406) 551-6135
accounting@onsiteenergyinc.com

Estimate

ADDRESS
Missoula Water Truck Barn
5800 Hwy 93
Missoula, MT 59804

ESTIMATE 3165
DATE 12/01/2025

ACTIVITY	AMOUNT

Design and installation of a 84.7 kW DC / 50 kW AC roof-mounted solar PV system at the Missoula Water Truck Barn in Missoula, MT, including all equipment, labor, and electrical scope necessary for a complete and code-compliant installation.

This is a good faith estimate based on preliminary site information.

Pricing reflects current material costs and are subject to change due to external factors beyond our control, including the implementation of tariffs.

Equipment subject to change to similar make/model depending on final design and availability.

Design Services 3,384.00
Includes necessary design and engineering services to produce a permit-ready solar PV construction plan set, including coordination with and approval from relevant stakeholders.

Excludes structural engineering review and stamp. Pricing assumes the Engineer of Record will provide structural analysis and any required stamped letters.

Subtotal: 3,384.00

Solar Electric System
All necessary solar equipment as outlined below:

Solar Modules 19,900.00
Safe Harbor Cost Incursion: Aptos 550W modules (QTY 100)

Solar Modules 10,746.00
Aptos 550W modules (QTY 54) - Additional for full system size

Inverter 19,243.00
SolarEdge 50kW, 208V Inverter (QTY 1), including monitoring capabilities and SolarEdge commercial power optimizers (QTY 152), or similar.

Racking 29,298.00
Unirac GridFlex 10 ballasted racking system with U-Anchor attachments, or similar.

Electrical Materials 19,408.00
Electrical Materials, DC wire, junction boxes and miscellaneous equipment.

Subtotal: 98,595.00

Project Labor

Construction Labor 82,972.00
All necessary labor to install and commission the project including the following:
-- project management and admin, shop prep, solar array installation, inverter installation and AC

interconnection, DC electrical work to the inverter, and commissioning and start-up.

Includes prevailing wages for construction labor.

Subtotal: 82,972.00

Project Fees Project fees cover all associated soft costs and support services necessary for successful project delivery, including the following: --Northwestern Energy Interconnection Application Fee --Permitting --Equipment Rental --Gross Receipts Tax	5,057.00

Subtotal: 5,057.00

Exclusions:
-- Any required structural upgrades if required.
-- Bonding

TOTAL **$190,008.00**

Accepted By

Accepted Date

Appendix B: Equipment Spec Sheets

aptos™
solar technology

DNA™ 144-Bifacial Dual Glass

Solar for Innovators

540W | 545W | 550W

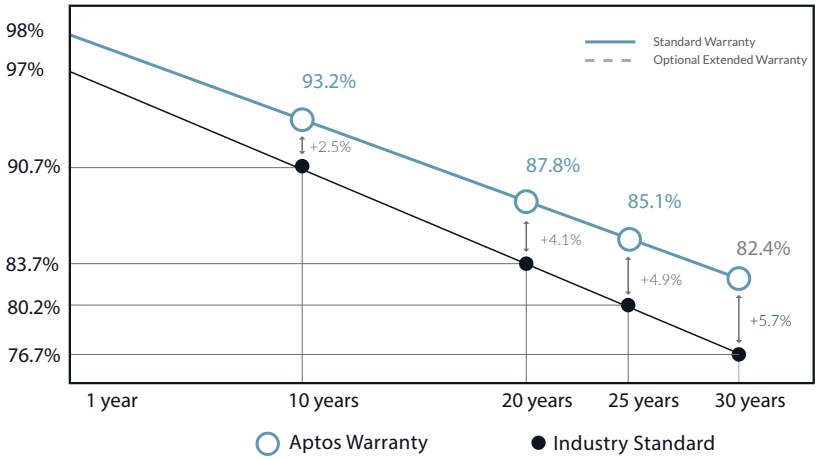
DNA-144-BF10-550W-DG

Residential | Commercial

Our DNA Split Cell Series uses advanced selective emitter PERC technology with thin film layers to improve heat tolerance, maximize energy harvest, minimize resistive loss, and use 5% more of the available active area for optimal power performance.

Designed & Engineered In Silicon Valley

Linear Performance Warranty



Key Features

Advanced Technology

Patented DNA™ technology boosts power performance & module efficiency.

Aesthetics

All black design with advanced split cell technology features 10 ultra-thin busbars that allow for less resistance and greater energy harvest.

Durable Design

Robust product design is resilient in extreme weather. Up to 5400 Pa snow load and 4000 Pa wind load

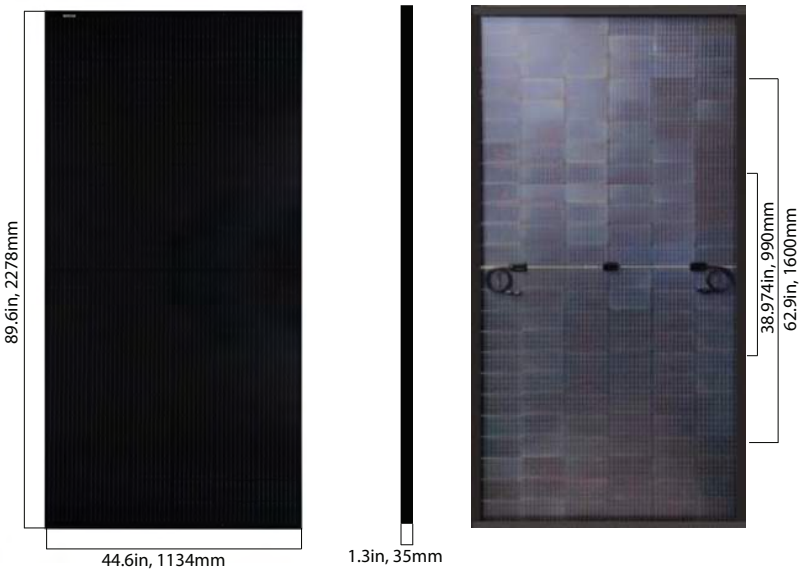
Awards

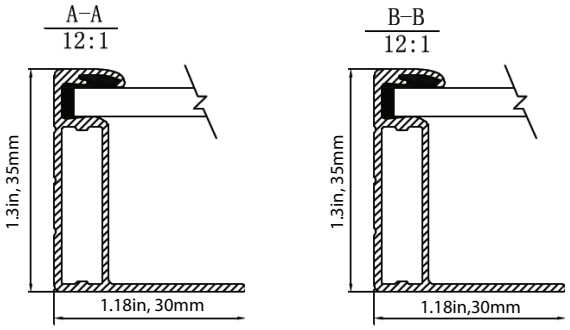
Winners of the Leadership in Solar Energy award for three consecutive years and listed as one of the Top Solar Products from 2021-2022.

Bankable Investment

Comprehensive warranty that covers both **30-year product** and **30-year power** performance.

DNA™ 144 Bifacial Dual Glass





Electrical Specifications

	DNA-144-BF10-540W-DG	DNA-144-BF10-545W-DG	DNA-144-BF10-550W-DG
STC Rated Output P_{mpp} (W)	540W	545W	550W
Module Efficiency	20.90%	21.09%	21.29%
Open Circuit Voltage V_{VOC} (V)	49.50	49.65	49.80
Short Circuit Current I_{SC} (A)	13.85	13.92	13.99
Rated Voltage V_{mp} (V)	41.65	41.80	41.95
Rated Voltage I_{mp} (A)	12.97	13.04	13.11

Standard Test Conditions for front-face of panel: 1000 W/m², 25°C, measurement uncertainty ≤3%

Bifacial Output-Rearside Power Gain

5%-Maximum Power (Pmax)	567W	572W	578W
5%-Module Efficiency STC(%)	21.94%	22.14%	22.35%
15%-Maximum Power (Pmax)	621W	627W	633W
15%-Module Efficiency STC(%)	24.03%	24.27%	24.50%
25%-Maximum Power (Pmax)	675W	682W	688W
25%-Module Efficiency STC(%)	26.12%	26.40%	26.63%

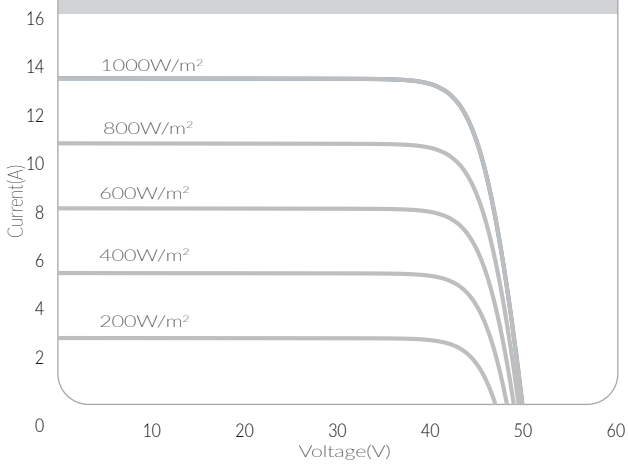
Test Operating Conditions

Maximum Series Fuse	30A
Maximum System Voltage	1,500 VDC (UL&IEC)
Maximum Load Capacity (Per UL 1703)	5400 PA Snow Load / 4000 Pa Wind Load
Fire Performance Class	Class C/Type 29

Mechanical Properties

Cell Type	Monocrystalline
Glass	AR Coating, High Transmission, Low Iron, Semi-Tempered Dual Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP68
Dimensions	89.68 X 44.6 X 1.3 in, 2278 X 1134 X 35 mm
Weight	71.20 lbs
Output Cable	4mm2 (EU)12AWG,(1200mm)
Cable Length	47.2in, 1200mm
Connector Type	Staubli EVO2

I-V Curve



Temperature Coefficients

Temperature Coefficients P_{mmp}	-0.390%/°C
Temperature Coefficients I_{sc}	+0.06%/°C
Temperature Coefficients V_{OC}	-0.300%/°C
Normal Operating Cell Temperature (NOCT)	45°C±2°C

Packaging Configuration

Modules per Pallet	31
Pallets per 40ft. Container	20
Pallet Dimensions	91.06 X 44.48 X 49.76 in
Pallet Weight (lbs)	2208
Modules per 40ft. Container	620

Certifications

C22.2 No.61730-1:19
C22.2 No.61730-2:19

IEC61730-1
IEC61730-2

Ref 1.4_7.29.23

2081 Business Center Drive, Ste 100
Irvine, CA 92612
www.aptossolar.com I sales@aptossolar.com

Aptos Solar Technology reserves the right to make specification changes without notice.

Three Phase Inverter with Synergy Technology

For the 208V Grid for North America

SE50KUS

INVERTERS

Powered by unique pre-commissioning process for rapid system installation

- Pre-commissioning feature for automated validation of system components and wiring during the site installation process and prior to grid connection
- Easy 2-person installation with lightweight, modular design (each inverter consists of 3 Synergy units and 1 Synergy Manager)
- Independent operation of each Synergy unit enables higher uptime and easy serviceability
- Built-in thermal sensors detect faulty wiring ensuring enhanced protection and safety
- Built-in arc fault protection and rapid shutdown
- Built-in PID mitigation for maximized system performance
- Monitored* and field-replaceable surge protection devices, to better withstand surges caused by lightning or other events
- Built-in module-level monitoring with Ethernet or cellular communication for full system visibility

*Applicable only for DC and AC SPDs

solaredge

/ Three Phase Inverter with Synergy Technology

For the 208V Grid for North America

SE50KUS

MODEL NUMBER APPLICABLE TO INVERTERS WITH PART NUMBER	SExxK-USx2Ixxxx SE50KUS	UNITS
OUTPUT		
Rated AC Active Output Power	50000	W
Maximum AC Apparent Output Power	50000	VA
AC Output Line Connections	3W + PE, 4W + PE	
Supported Grids	WYE: TN-C, TN-S, TN-C-S, TT, IT, Delta: IT	
AC Output Voltage Minimum-Nominal-Maximum(1) (L-N)	105 – 120 – 132.5	Vac
AC Output Voltage Minimum-Nominal-Maximum(1) (L-L)	183 – 208 – 229	Vac
AC Frequency Min-Nom-Max(1)	59.5 – 60 – 60.5	Hz
Maximum Continuous Output Current (per Phase, PF=1)	139.5	Aac
GFDI Threshold	1	A
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes	
Total Harmonic Distortion	≤ 3	%
Power Factor Range	±0.85 to 1	
INPUT		
Maximum DC Power (Module STC) Inverter / Synergy Unit	87500 / 29165	W
Transformer-less, Ungrounded	Yes	
Maximum Input Voltage DC+ to DC-	600	Vdc
Operating Voltage Range	370 – 600	Vdc
Maximum Input Current	3 x 46.5	Adc
Reverse-Polarity Protection	Yes	
Ground-Fault Isolation Detection	167kΩ sensitivity per Synergy Unit(2)	
CEC Weighted Efficiency	97	%
Nighttime Power Consumption	< 12	W
ADDITIONAL FEATURES		
Supported Communication Interfaces(3)	2 x RS485, Ethernet, Wi-Fi (optional), Cellular (optional)	
Smart Energy Management	Export Limitation	
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection	
Arc Fault Protection	Built-in, User Configurable (According to UL1699B)	
Photovoltaic Rapid Shutdown System	NEC 2014 – 2023, built-in	
PID Rectifier	Nighttime, built-in	
RS485 Surge Protection (ports 1+2)	Type II, field replaceable, integrated	
AC, DC Surge Protection	Type II, field replaceable, integrated	
DC Fuses (Single Pole)	25A, integrated	
Pre-Commissioning	Built-in(4)	
VAR at Night(5)	Yes	
DC SAFETY SWITCH		
DC Disconnect	Built-in	
STANDARD COMPLIANCE		
Safety	UL1699B, UL1741, UL1741 SA, UL1741 SB, UL1998, CSA C22.2#107.1, Canadian AFCI according to T.I.L. M-07	
Grid Connection Standards	IEEE 1547-2018, Rule 21, Rule 14 (HI)	
Emissions	FCC part 15 class A	
Advanced Grid Support Capabilities	L/HFRT; L/HVRT; VOLT-VAR; VOLT-Watt; Frequency-Watt; Ramp Rate Control; Fixed Power Factor; Fixed Q; Cos (Phi) / Watt	

(1) For other regional settings please contact SolarEdge support.
(2) Where permitted by local regulations.
(3) For specifications of the optional communication options, visit the Communication product page or the Knowledge Center to download the relevant product datasheet.
(4) Not available for P/Ns SExxK-xxxxxBPxx.
(5) For details, see Set Volt Ampere Reactive at Night.

/ Three Phase Inverter with Synergy Technology

For the 208V Grid for North America

SE50KUS

MODEL NUMBER APPLICABLE TO INVERTERS WITH PART NUMBER		SExxK-USx2Ixxxx SE50KUS	UNITS
INSTALLATION SPECIFICATIONS			
Number of Synergy Units per Inverter		3	
AC Max Conduit Size		2 ½"	in
Max AWG Line / PE		4/0 / 1/0	
DC Max Conduit Size		1 x 3"; 2 x 2"	in
DC Input Inverter / Synergy Unit	Multi-input (SExxK-USxxxxxZ4)	12 / 4 pairs; 6 – 12 AWG	
	Combined input (SExxK-USxxxxxW4)	3 pairs / 1 pair, Max 2 AWG; copper or aluminum	
Dimensions (H x W x D)		Synergy Unit: 22 x 12.9 x 10.75 / 558 x 328 x 273 Synergy Manager: 14.17 x 22.4 x 11.6 / 360 x 560 x 295	in / mm
Weight		Synergy Unit: 70.4 / 32 Synergy Manager: 39.6 / 18	lb / kg
Operating Temperature Range		-40 to +140 / -40 to +60(6)	℉ / °C
Cooling		Fan (user replaceable)	
Noise		< 67	dBA
Protection Rating		NEMA 3R	
Mounting		Brackets provided	

(6) For power de-rating information refer to the Temperature Derating Technical Note for North America.

SolarEdge is a global leader in smart energy technology. By leveraging world-class engineering capabilities and with a relentless focus on innovation, SolarEdge creates smart energy solutions that power our lives and drive future progress.

SolarEdge developed an intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. The SolarEdge DC optimized inverter maximizes power generation while lowering the cost of energy produced by the PV system.

Continuing to advance smart energy, SolarEdge addresses a broad range of energy market segments through its PV, storage, EV charging, UPS, and grid services solutions.

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Cautionary Note Regarding Market Data and Industry Forecasts: This brochure may contain market data and industry forecasts from certain third-party sources. This information is based on industry surveys and the preparer's expertise in the industry and there can be no assurance that any such market data is accurate or that any such industry forecasts will be achieved. Although we have not independently verified the accuracy of such market data and industry forecasts, we believe that the market data is reliable and that the industry forecasts are reasonable.

CE

solaredge

GRIDFLEX® 10

PRECISION | PERFORMANCE | ENDURANCE

UNIRAC
BETTER SOLAR STARTS HERE

ENGINEERED TO PROTECT YOUR ASSETS

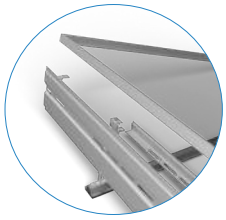
- Minimizes ballast and attachments, reduces expensive on-roof installation hours, adds unparalleled system integrity.
- Tighter row-spacing options for maximum module density: 10", 13", & 17" – Get more modules on your roof!
- Airflow-deflecting design optimizes module uplift resistance to effectively manage wind loads across the entire array.

SECURED CONNECTIONS

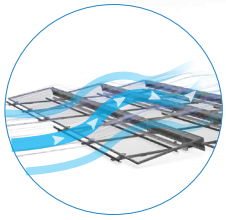
- Easy access torque-able and check-able clamps— GFX10 offers rapid and accurate installation every time.
- "Pop-the-hood" – hinged, one-step vertical swing-up for easy system O&M and effortless single-module access. Maintenance is a breeze!
- Benefit from Green-Zone module mounting, ensuring module and system load-sharing.

CUT COSTS, NOT CORNERS

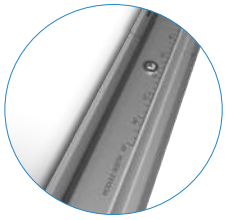
- Install aids are printed on each rail for precision and accuracy - streamline every installation process, every time!
- Integrated tool-less wire management components.



QUICK, EASY ACCESS BENEATH PANELS: NO REMOVAL OF INSTALLED PARTS!



DESIGNED FOR MAXIMUM UPLIFT RESISTANCE



RAIL-STAMPED MEASUREMENT GUIDES FOR PRECISE INSTALLATION

WHY GRIDFLEX®10?

UNIRAC COMMERCIAL ADVANTAGE

Remember, you're not just investing in a product, but in a system-based design that will continue to perform and deliver value long into the future. With each component carefully engineered and selected for stability, efficacy, and sustaining performance, GFX10 ensures enduring array functionality. Other products leave you with expensive misalignments, inaccessible components, and a reoccurring cycle of difficult quality checks and upkeep. Instead, build it right the first time with GFX10. With dedicated support assistance, nationwide field training, and an unsurpassed domestic and international supply chain, you can trust us to deliver on our promises!

FOR QUESTIONS OR CUSTOMER SERVICE CONTACT:
505-242-6411 | SALES@UNIRAC.COM | WWW.UNIRAC.COM

PUB2025FEB06-V1

CONFORMS TO UL3741

CONFORMS TO UL2703

ISO 9001:2015 14001:2015 CERTIFIED

SPECIFICATIONS & RATINGS

UNIRAC
BETTER SOLAR STARTS HERE

APPLICATIONS	10 degree, grid-based flat roof system
ROOF TYPE CAPABILITY	All Membrane including TPO, EPDM, PVC, Mineral Cap Tar and Gravel, Ballasted
MODULE ORIENTATION	Landscape
WIND EXPOSURE CATEGORY	B, C, D
USGS SEISMIC CATEGORIES	A, B, C, D
BUILDING HEIGHT	Up to 200 ft
CORROSION RESISTANT MATERIALS [COATINGS]	ZAM and Galvalume
WARRANTY	25 Year Manufacturer's Warranty
ROOF SLOPE	Up to 7 degrees
WAVY ROOFS	Up to 3° of undulation
UL 2703 GROUNDING & BONDING	Yes
UL 2703 MECHANICAL LOADING	Yes
UL 2703 FIRE LISTING	Class A Rating with Type 1, 2, 3, 19, 22, 25, 29, 30
UL 3741	Yes
BALLAST BLOCK SIZE	4" x 8" x 16" and/or 2" x 8" x 16" Nominal
ROW SPACING	10", 13", and 17" Module to Module
BALLAST CAPACITY	Up to 8 Ballast Blocks / module
ROOF PAD MATERIAL	Santoprene
ATTACHMENT COMPATIBILITY	U-Anchor, OMG, Unirac Flashloc RM, and other similar attachments
BUILT IN INSTALLATION MEASUREMENT TOOLS	Yes
MODULE CLAMPS	**All Clamps:** Torqueable/Checkable at Module Green Zones **South Clamp:** Hinged Return Flange Mounting **North Clamp:** Fixed Top Down
O&M ACCESSIBILITY	"Pop-the-Hood" for quick and easy single panel access Loosen north clamps to raise module for electrical BOS access
SINGLE TOOL ASSEMBLY	3/8" Socket
MODULE SIZE COMPATIBILITY	39" - 52" Module Width 71" - 100" Module Length
MAXIMUM SYSTEM VOLTAGE	1500 V
MODULE SPACING	1/4"

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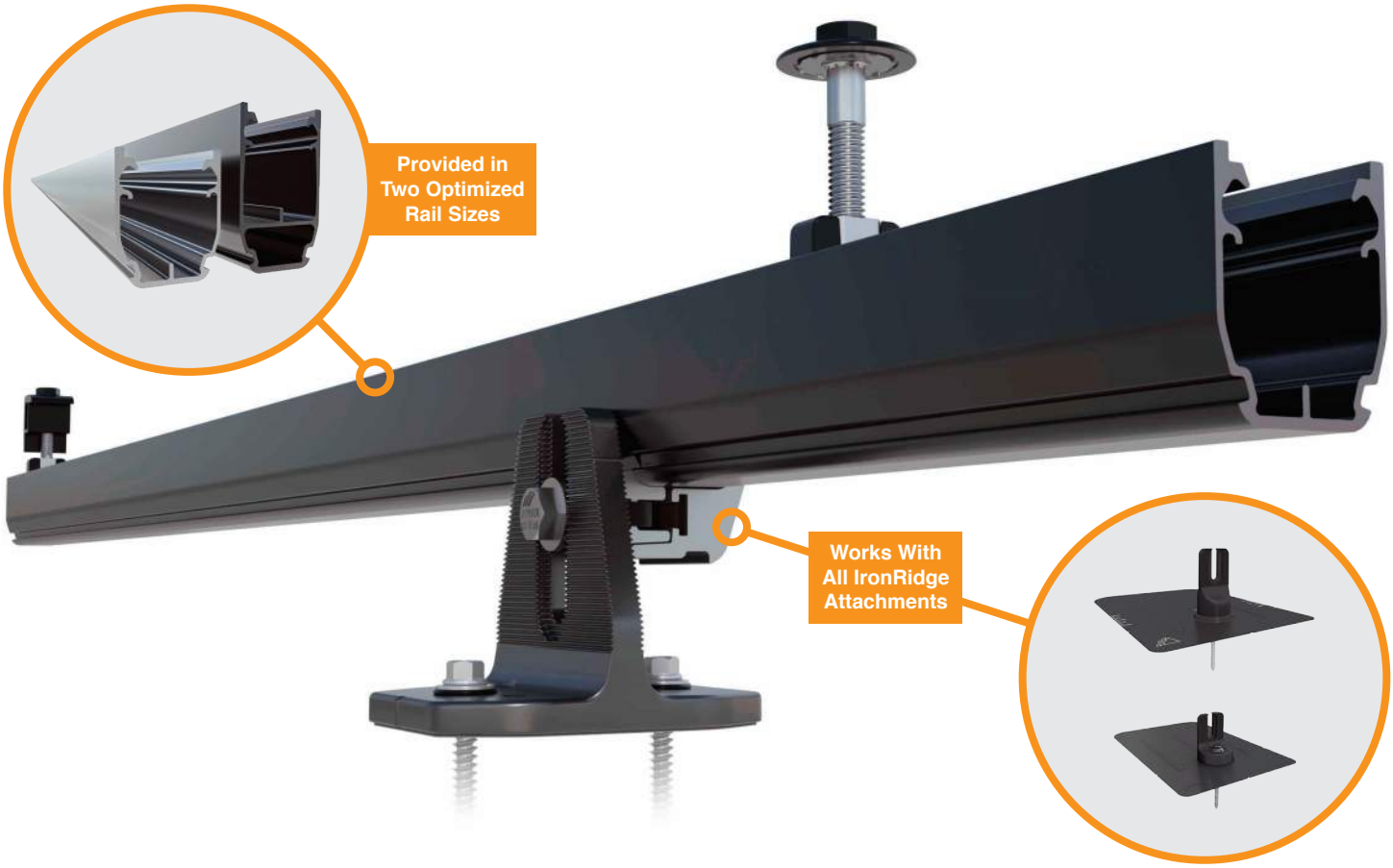
CONFORMS TO UL3741
CONFORMS TO UL2703
ISO 9001:2015 14001:2015 CERTIFIED

Datasheet

IRONRIDGE

Aire® Flush Mount System



Breathe easy with accelerated installations.

The Aire® racking system has been carefully engineered to streamline every part of the installation process. We've eliminated tiresome hassles, so that you get off the roof and on to your next project faster than ever.

Aire® retains the strength and reliability that IronRidge installers depend on. It also takes wire management to the next level with the first (and only) NEC-compliant rail, formally approved and listed as a cable tray.

Strength Tested

All components have been evaluated for superior structural performance.

PE Certified

Pre-stamped engineering letters are available online for most states.

Class A Fire Rating

Certified to maintain the fire resistance rating of the existing roof structure.

Approved Cable Tray

Open channel listed to NEMA VE 1, certified to hold PV and DG cables.

UL 2703 Listed System

Entire system and components meet the latest effective UL 2703 standards.

25-Year Warranty

Products are guaranteed to arrive without any impairing defects.

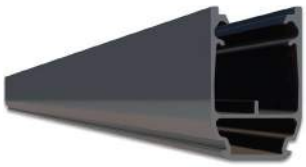
Rails

Aire® A1 Rail

The lighter, open Aire® rail for standard conditions.

- 6’ spanning capability
- Wire management tray
- Mill or anodized black

Aire® A2 Rail



The tougher, open Aire® rail for higher load capacity.

- 8’ spanning capability
- Wire management tray
- Mill or anodized black

Aire® Rail Ties

Structurally connect and bond Aire® Rails together.

- Reinstallable, up to 5x
- Internal splice design
- No more splice rules

Aire® Dock

Connects Aire® Rails to attachments with ease.

- Clicks on, slides easily
- Drops into open slots
- Anodized assembly

Clamps & Grounding

Aire® Lock Mids

Securely bond between modules to Aire® Rails.

- Fits 30-40mm modules
- Utilizes UFO® design
- Minimal 1/2” gap

Aire® Lock Ends

Securely bond modules to Aire® Rails along ends.

- Fits 30-40mm modules
- Easy rail engagement
- Clean aesthetics

Aire® Lock Stealth®

Securely bonds modules to rail ends, entirely hidden.

- Angled for easy install
- Robust tether leash
- Fits most modules

Aire® Lug

Bonds Aire® Rails to grounding conductors.

- Simplified with single bolt
- Low-profile form factor
- Works with 10-6 AWG

Accessories

Aire® Caps

Block entry and provide a finished look to Aire® Rails.

- Stay secure on rail ends
- Symmetrical, with drain
- Cover rough-cut ends

Aire® Clip

Keeps wiring contained in open Aire® Rail channels.

- No module interference
- Simple press-in design
- Slot for easy removal

Aire® MLPE Mount

Securely bonds MLPE and accessories to Aire® Rails.

- Glove-friendly installation
- Lays flush in rail channel
- Low profile form factor

Aire® All Tile Hook

Attaches rails to tile roofs, with Aire® Dock included.

- Works on flat, S, & W tiles
- Single-socket installation
- Optional deck flashing

Resources

Design Assistant

Quickly go from rough layout to fully engineered system.

Go to IronRidge.com/design

Approved for FL Hurricane Zones

Aire® has Florida Product Approval. Additional details can be found on the Florida Building Code website.

Learn More at bit.ly/florida-aire

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Appendix C: Helioscope Production Report

Water Building - 550W Water Building--City of Missoula, 1345 West Broadway Missoula MT

Report

Project Name	Water Building--City of Missoula
Project Address	1345 West Broadway Missoula MT
Prepared By	Blake Bjornson blake@onsiteenergyinc.com

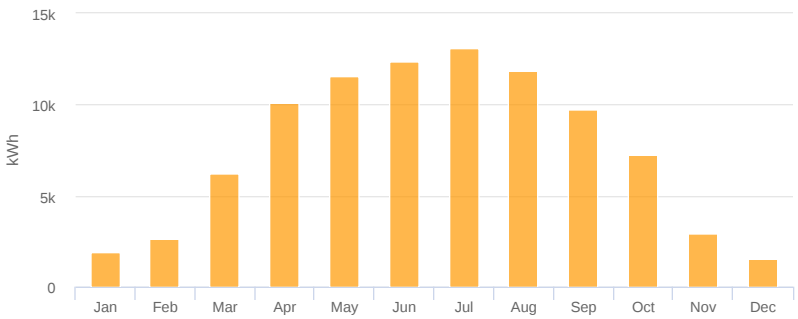
OnSite Energy
SOLAR DESIGN & INSTALL

System Metrics

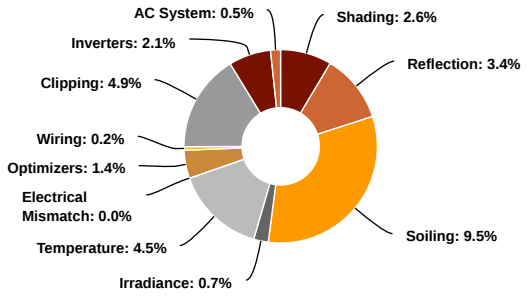
Design	Water Building - 550W
Module DC Nameplate	81.40 kW
Inverter AC Nameplate	50.00 kW Load Ratio: 1.63
Annual Production	91.25 MWh
Performance Ratio	73.6%
kWh/kWp	1,121.0
Weather Dataset	TMY, MISSOULA INTERNATIONAL AP, NSRDB (tmy3, I)
Simulator Version	ad6b3fdeb2-67a74084f3-ba53ed28c0-bff68830a4

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,379.8	
	POA Irradiance	1,522.7	10.4%
	Shaded Irradiance	1,483.8	-2.6%
	Irradiance after Reflection	1,433.3	-3.4%
	Irradiance after Soiling	1,296.5	-9.5%
	Total Collector Irradiance	**1,296.7**	**0.0%**
Energy (kWh)	Nameplate	105,538.6	
	Output at Irradiance Levels	104,768.8	-0.7%
	Output at Cell Temperature Derate	100,038.6	-4.5%
	Output after Electrical Mismatch	100,038.6	0.0%
	Optimizer Output	98,637.3	-1.4%
	Optimal DC Output	98,464.3	-0.2%
	Constrained DC Output	93,678.2	-4.9%
	Inverter Output	91,710.1	-2.1%
	Energy to Grid	**91,251.5**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp	11.1 °C	
	Avg. Operating Cell Temp	20.5 °C	
Simulation Metrics			
	Operating Hours	4677	
	Solved Hours	4677	

Condition Set

Description	Condition Set 1											
Weather Dataset	TMY, MISSOULA INTERNATIONAL AP, NSRDB (tmy3, I)											
Solar Angle Location	Meteo Lat/Lng											
Transposition Model	Perez Model											
Temperature Model	Sandia Model											
Temperature Model Parameters	Rack Type	a	b	Temperature Delta								
	Fixed Tilt	-3.56	-0.075	3°C								
	Flush Mount	-2.81	-0.0455	0°C								
	East-West	-3.56	-0.075	3°C								
	Carport	-3.56	-0.075	3°C								
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D
	50	50	25	2	2	2	2	2	2	2	25	50
Albedo	J	F	M	A	M	J	J	A	S	O	N	D
	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Rear Mismatch Loss	10%	Rear Shading Factor	5%									
Module Transparency	0%											
Irradiation Variance	5%											
Cell Temperature Spread	4° C											
Module Binning Range	-2.5% to 2.5%											
AC System Derate	0.50%											

Module & Component Characterizations	Type	Component	Characterization	Bifacial
	Module	DNA-144-BF10-550W (Aptos Solar)	Spec Sheet Characterization, PAN	False
	Inverter	SE50K (SolarEdge)	Spec Sheet	N/A
	Buck Boost Optimizer	U650B (SolarEdge)	Mfg Spec Sheet	N/A

Components

Component	Name	Count
Inverters	SE50K (SolarEdge)	1 (50.00 kW)
Strings	10 AWG (Copper)	8 (1,563.1 ft)
Optimizers	U650B (SolarEdge)	148 (96.20 kW)
Module	Aptos Solar, DNA-144-BF10-550W (550W)	148 (81.40 kW)

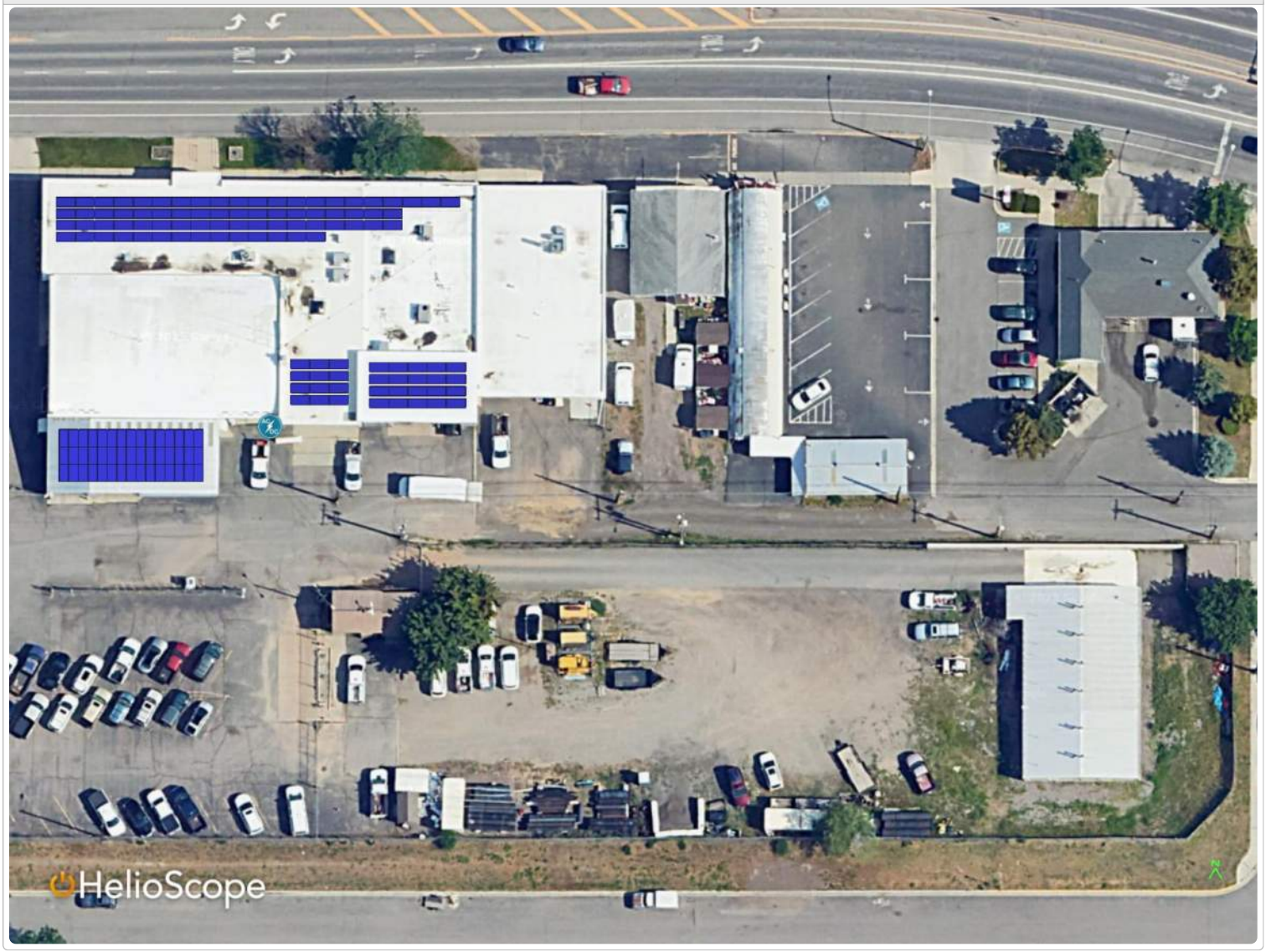
Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	12-20	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 2	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 180°	0.8 ft	1x1	71	71	39.05 kW
Field Segment 3	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 180°	1.0 ft	1x1	12	12	6.60 kW
Field Segment 4	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 180°	1.0 ft	1x1	20	20	11.00 kW
Field Segment 5	Flush Mount	Portrait (Vertical)	25°	180°	0.0 ft	1x1	45	45	24.75 kW
Field Segment 5	Flush Mount	Portrait (Vertical)	15°	0°	0.4 ft	1x1			0
Field Segment 6	Flush Mount	Portrait (Vertical)	15°	180°	0.4 ft	1x1			0
Field Segment 7	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 180°	1.4 ft	1x1			0

Detailed Layout2



Truck Barn - 550W Water Building--City of Missoula, 1345 West Broadway Missoula MT

Report

Project Name	Water Building--City of Missoula
Project Address	1345 West Broadway Missoula MT
Prepared By	Blake Bjornson blake@onsiteenergyinc.com

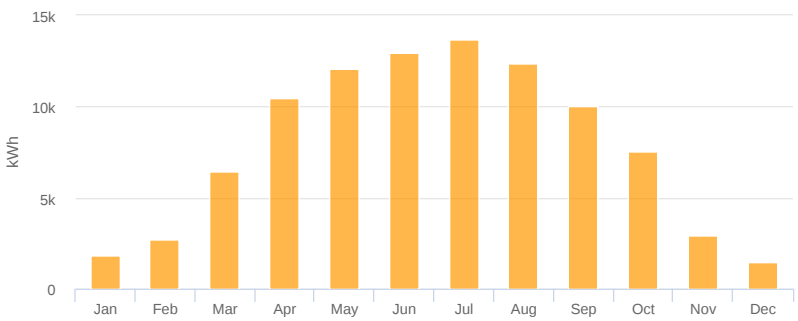
OnSite Energy
SOLAR DESIGN & INSTALL

System Metrics

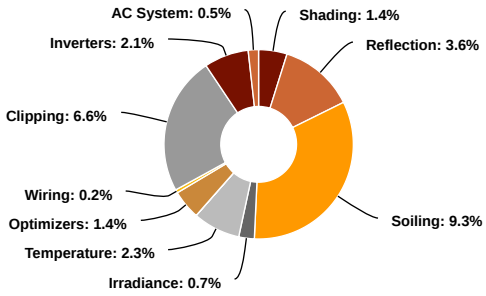
Design	Truck Barn - 550W
Module DC Nameplate	84.70 kW
Inverter AC Nameplate	50.00 kW Load Ratio: 1.69
Annual Production	94.48 MWh
Performance Ratio	74.8%
kWh/kWp	1,115.5
Weather Dataset	TMY, MISSOULA INTERNATIONAL AP, NSRDB (tmy3, I)
Simulator Version	ad6b3fdeb2-67a74084f3-ba53ed28c0-bff68830a4

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,379.8	
	POA Irradiance	1,490.5	8.0%
	Shaded Irradiance	1,470.1	-1.4%
	Irradiance after Reflection	1,417.0	-3.6%
	Irradiance after Soiling	1,285.3	-9.3%
	Total Collector Irradiance	**1,285.3**	**0.0%**
Energy (kWh)	Nameplate	108,846.4	
	Output at Irradiance Levels	108,031.5	-0.7%
	Output at Cell Temperature Derate	105,575.8	-2.3%
	Output after Electrical Mismatch	105,575.8	0.0%
	Optimizer Output	104,097.2	-1.4%
	Optimal DC Output	103,933.4	-0.2%
	Constrained DC Output	97,031.9	-6.6%
	Inverter Output	94,954.8	-2.1%
	Energy to Grid	**94,480.1**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		11.1 °C
	Avg. Operating Cell Temp		18.0 °C
Simulation Metrics			
	Operating Hours		4677
	Solved Hours		4677

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, MISSOULA INTERNATIONAL AP, NSRDB (tmy3, I)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.075	3°C
Flush Mount	-2.81	-0.0455	0°C
East-West	-3.56	-0.075	3°C
Carport	-3.56	-0.075	3°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
50	50	25	2	2	2	2	2	2	2	25	50

Albedo

J	F	M	A	M	J	J	A	S	O	N	D
0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

Rear Mismatch Loss	10%	Rear Shading Factor	5%
Module Transparency	0%		
Irradiation Variance	5%		
Cell Temperature Spread	4° C		
Module Binning Range	-2.5% to 2.5%		
AC System Derate	0.50%		

Module & Component Characterizations

Type	Component	Characterization	Bifacial
Module	DNA-144-BF10-550W (Aptos Solar)	Spec Sheet Characterization, PAN	False
Inverter	SE50K (SolarEdge)	Spec Sheet	N/A
Buck Boost Optimizer	U650B (SolarEdge)	Mfg Spec Sheet	N/A

Components

Component	Name	Count
Inverters	SE50K (SolarEdge)	1 (50.00 kW)
Strings	10 AWG (Copper)	8 (1,401.0 ft)
Optimizers	U650B (SolarEdge)	154 (100.10 kW)
Module	Aptos Solar, DNA-144-BF10-550W (550W)	154 (84.70 kW)

Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	12-20	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 2	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 180°	0.8 ft	1x1			0
Field Segment 3	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 180°	1.0 ft	1x1			0
Field Segment 4	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 180°	1.0 ft	1x1			0
Field Segment 5	Flush Mount	Portrait (Vertical)	25°	180°	0.0 ft	1x1			0
Field Segment 5	Flush Mount	Portrait (Vertical)	15°	0°	0.4 ft	1x1			0
Field Segment 6	Flush Mount	Portrait (Vertical)	15°	180°	0.4 ft	1x1			0
Field Segment 7	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 180°	1.4 ft	1x1	154	154	84.70 kW

Detailed Layout2