

**Willmar Public Schools  
Independent School District 347**



**Request for Proposals  
Solar for Schools Grant**

**Date of Issue: December 10, 2024 Proposal Due Date: December 30, 2024**



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## **I. OBJECTIVE**

ISD 347 Willmar Public Schools is soliciting competitive sealed proposals from qualified contractors to design, build, and maintain a solar installation on school district property and provide power to school district facilities. The district has been approved to submit a full Minnesota Solar for Schools grant application.

## **II. OVERVIEW**

ISD 347 Willmar Public Schools is seeking proposals from interested firms capable of designing, engineering, installing, and maintaining solar PV roof-mounted arrays.

In the long term, the school district may be interested in developing solar energy for other sites, and the results of this RFP may be used for future projects, however, for purposes of this RFP, respondents should limit their responses to only the provided sites.

The school district believes on-site PV power generation will provide a long-term financial benefit by reducing energy costs through the reduction of peak demand loads and daily energy consumption at the sites. Through on-site PV solar generation, the school district hopes to:

- Reap the financial benefits of more affordable electricity at minimal cost.
- Reduce environmental impact.
- Provide an example of successful renewable energy generation and showcase our organization as a leader in the development of renewable energy sources.

Through this RFP process, the school district intends to select only one provider for the solar project and is looking for the “best value” proposal based on the selection criteria stated within this RFP.

## **III. RFP SCHEDULE**

The following schedule and deadlines apply to this solicitation:

**RFP Issue Date:** December 10, 2024



**Pre-Proposal Conference:** Available in person on December 18, 2024, at 2:30 pm in the Auditorium at the Willmar Education and Arts Center located at 611 5th St SW Willmar, MN 56201. After the meeting, we'll provide an opportunity to facilitate a tour of the below locations.

Locations:

Willmar Senior High  
2701 30th St NE  
Willmar, MN 56201

Willmar Middle School  
201 Willmar Ave SE  
Willmar, MN 56201

Lakeland Elementary  
1001 Lakeland Dr. SE  
Willmar, MN 56201

Roosevelt Elementary  
1800 19th Ave SW  
Willmar, MN 56201

Submit RFP questions to:

Questions are due by December 19, 2024. Responses will be provided by December 20, 2024.

Aaron Pilarski - Buildings and Grounds Manager  
320-231-8530, pilarskia@willmar.k12.mn.us, subject line: Solar Questions

Request for Proposals Due Date: 12:01 PM, December 30, 2024.

Final Selection: December 30, 2024.





Board Approval: January 13, 2025.

#### IV. SITE INFORMATION

Over the past two years, Willmar Public Schools have averaged the kilowatt-hours (kWh) per month specified in the table below. For specific array location, reference exhibit attachment D.

Locations:

Willmar Senior High  
2701 30th St NE  
Willmar, MN 56201

Willmar Middle School  
201 Willmar Ave SE  
Willmar, MN 56201

Lakeland Elementary  
1001 Lakeland Dr. SE  
Willmar, MN 56201

Roosevelt Elementary  
1800 19th Ave SW  
Willmar, MN 56201

If the provider, in consultation with the school district, determines that a roof-mounted array is the best option, the provider will be responsible for ensuring that roof warranties remain in place and avoid damage to existing roofs.

Site	Average monthly kWh Consumption	Service Voltage	Existing Roof Warranty [yes/no]	Roof Type	Structural and/or Electrical Plans	Back-up Generator On-site[yes/no ]
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					Available [yes/no]	
Willmar Senior High	310,912	480V	Yes	EPDM	yes	yes
Willmar Middle School	145,060	208V	Yes	EPDM and TPO	yes	no
Lakeland Elementary	79,200	480V	Yes	EPDM	yes	no
Roosevelt Elementary	54,408	208V	Yes	EPDM	yes	no

## **V. EXAMINATION OF SITE BEFORE SUBMITTING PROPOSAL**

Each provider must inform themselves fully of the conditions relating to the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of the obligation to carry out the provisions of the contract.

The provider will design, install, and maintain a solar photovoltaic system to maximize the solar resources considering the facilities' electrical demand and load patterns, proposed installation site, available solar resources, applicable zoning ordinances, installation costs, and other relevant factors, which shall be discussed in the provider's proposal. The provider should make every effort to visit the sites and determine the best course of action. The ability to tour the sites will be part of the pre-bid conference.

## **VI. PROVIDER QUALIFICATIONS**

To qualify as the provider for the award of this agreement, the provider must either individually or collectively demonstrate extensive training, relevant expertise, and a thorough knowledge of the professional services, functions, activities, and related responsibilities to successfully perform their role in this solar photovoltaic installation.

## **VII. PERSONNEL QUALIFICATIONS AND ABILITIES**

Specialized experience is required of the proposed project personnel to undertake the work assignments. Proposals must demonstrate the capability, academic background, training, certifications, and experience of the proposed personnel. The availability of the proposed staff is also of crucial importance and must be demonstrated. The specific responsibility of staff to be assigned to the project must be included, as well as the professional background and caliber of previous experience of key persons and



consultants to be assigned to the project. If sub-consultants are employed, similar information must be provided and the portions to be sub-consulted must be identified. (There is no penalty for the use of sub-consultants; the qualifications of the entire team will be evaluated).

Provider(s) shall possess:

- Valid and pertinent State of Minnesota contractor construction licenses.
- Minnesota Professional Engineering (PE) registration for photovoltaic/electrical, structural, civil, and fire protection work.
- North American Board of Certified Energy Practitioners (NABCEP) certification.

## **VIII. PROJECT SCOPE AND STANDARDS**

The provider will design, provide, install, and maintain the solar photovoltaic systems. The scope of this project is all-inclusive and includes planning, engineering, labor, materials, delivery, installation, and commissioning, as well as all warranties and maintenance. This includes all structural and utility modifications that are required. The provider shall include in its proposal all elements necessary for a turn-key project including rebate applications, grid connection agreement, all permits and approvals from governing agencies, and all labor, taxes, services, and equipment. The provider shall apply for and obtain all necessary required approvals and permits. All fees required shall be the responsibility of the applicant.

The provider shall decide on the best location for metering and the number of meters required. All proposed roof-mounted solar panels, tracks, and anchoring equipment shall not exceed ten pounds per square foot. The provider shall verify the structural capacity of the roof.

The provider shall submit the Solar for Schools full grant application to the State of Minnesota and abide by grant requirements.

Ownership of Solar Renewable Energy Credits (RECS) or Certificates should be assumed to



be owned by the school district unless otherwise specified by the provider as part of the proposal.

The provider is responsible for all connections and agreements with the utility.

All equipment shall be UL-listed. All installations shall comply with current local government-approved building and electrical codes. The guaranteed minimum output from the system shall be 85% of the expected performance output from the system.

## **IX. CONTENT OF PROPOSAL**

To maintain uniformity with all proposals furnished by the provider, proposals shall include the following:

- Overview of Principal Elements. A project understanding summary that includes an overview of the principal elements of the proposal, a demonstration of an understanding of the project objectives, and a description of your approach to solar systems. Include any suggestions or special concerns that the school district should be made aware of, the proposed configuration of equipment, and any additional scope of work tasks you feel are necessary for the successful completion of the project. Include a discussion of work assignments between the provider and subcontractors used, if any.
- Schematic Design Layout. Provider shall provide a system schematic design layout for the systems, including photovoltaic model type and model no., wattage, number of modules, year 1 production, degradation percentage, inverter type and model, mounting system type, azimuth, tilt, system size AC and DC, and the impact on the utility rates and demand charges.
- Cost. The school district is eligible to receive a Solar for Schools grant of 60% of the cost of the project not to exceed \$500,000. The provider shall incorporate the grant and federal incentives into the proposal. Provider shall identify costs to the school district and anticipated savings over 30 years.
- Financing Options. There are multiple financing options provided by the Solar for Schools program and RFP document for funding a project. The SFS Funding





Options in the SFS RFP document are reproduced below. The School District will accept all options contemplated by the Solar for Schools Program.

- Direct Ownership, No Debt with elective pay from the federal government
  - Direct Ownership, Debt Financed
  - Power Purchase Agreement (PPA)
  - Facility Lease
  - Capital Lease
  - Guaranteed Energy Savings (GES) Contract
  - Other
  - Unknown
- Minimum Qualifications. Sufficient information to evaluate the provider's ability to complete the scope of work and to meet the following minimum qualifications:
  - Appropriate business and contracting licenses in good standing
  - Appropriate other licensing in good standing
  - A list of personnel who will work on the project, including resumes of proposed project team members that delineate education, current licenses and certificates, prior employment, and titles.
- Project Team Structure: An organizational chart describing the roles and responsibilities of each person.
- References. A list of similar projects that your firm completed within the last 5 years. To be considered, respondents are required to have designed, installed, operated, maintained, and completed a minimum of five (5) solar PV projects in the United States that are commercial grid-connected solar PV systems. One (1) of the referenced projects must be with a local government, school, state, or tribal government. Project information should include a project description, agency or client name along with the person to contact, telephone number(s) and e-mail addresses, year completed, and project construction and design cost.
- Proposal submittal and signature. The proposal shall be signed by a company official with the power to bind the company in its proposal. All proposals must be completely responsive to the RFP.
- Warranties/Guarantees. The Respondent shall provide the following minimum warranties/guarantees:



- 10-year inverter warranty.
- 20-year PV panel warranty, with a maximum of 20% degradation.

## **X. TECHNICAL SPECIFICATIONS**

The following technical information shall be provided.

- Major equipment manufacturers
- Description of technology and configuration
- Solar system layout of equipment and characteristics
- Electrical interconnection and metering/net-metering
- Foundation of PV support system
- Level of efficiency
- DC and AC capacity rating
- Expected annual energy production in kWh
- Communications, control, and instrumentation
- Facility limitations that may constrain operation
- Project Management Plan
- Start-up and testing
- Design life loading (wind, seismic, etc.)
- Description of frequency and duration of scheduled maintenance
- Provide any information that could impact the cost, construction schedule or output capability of the project.
- Proposals shall demonstrate a proven, comprehensive data acquisition system with current and historical data available remotely through a real-time internet site capable of tracking, but not be limited, to the following:
  - Site-specific actual kWh production (average and cumulative totals)
  - Site-specific instantaneous maximum kWh production
- Proposals shall provide evidence that the proposed technology and equipment would meet or exceed all currently applicable and proposed safety and interconnection standards. All equipment components must be listed or recognized by an appropriate safety laboratory (e.g., Underwriter's Laboratory [UL]), and meet existing facility structural and fire safety requirements.



- Proposals shall provide evidence that the proposed technology and equipment would meet or exceed all currently applicable and proposed environmental standards.
- Proposals shall provide evidence that the proposed technology and equipment are designed for normal operation in the Minnesota climate.
- Proposals shall provide evidence that the proposed technology does not incorporate proprietary components and that the system design allows for multiple sources of supply and/or repair.
- Proposals shall describe reusability or recyclability of proposed technology and equipment.

## **XI. OPERATIONS AND MAINTENANCE**

Provide a description of the basic philosophy for performing O&M and include a discussion of contracting for outside services, if applicable. The successful respondent shall provide copies of the complete O&M manuals for all components of the system upon system commissioning.

The provider is required to enter into a maintenance agreement for one year from the date of substantial completion of the project (construction). The one-year maintenance plan should include a schedule of inspections, maintenance documentation sheets, data collection, and technical support staff contact information. During this maintenance period, the provider shall be responsible for tracking solar system equipment that ceases to function as intended, recycling any modules or inverters provided under this contract, and reporting the recycling of any modules or inverters to the Minnesota Pollution Control Agency. Provide information on the provider's capabilities of monitoring photovoltaic generating systems, if available. At the time of any project-level work order execution, the Contractor shall use solar PV system components that are readily reusable or recyclable.

## **XII. PROJECT SCHEDULE**

All proposals must include a project schedule that includes the following milestones:

- Permitting begins
- Final design plans complete.



- Equipment ordered.
- Construction begins.
- Electrical generation begins.

### **XIII. FINANCIAL STATEMENTS**

Please submit a detailed financial report prepared per generally accepted accounting principles (GAAP) reflecting the current (as of the most recent financial statement date) financial condition of the provider. Such a report must include a balance sheet, income statement, and statement of cash flows, along with applicable footnotes, dated concurrently for at least each of the preceding three years ending on the most recent fiscal quarter such statements were prepared. Public entities or subsidiaries should attach SEC Form 10-K along with, as applicable, detailed unaudited statements for the provider. Non-public entities may attach either unaudited financial statements or copies of tax forms and schedules that are filed with the Internal Revenue Service where applicable.

### **XIV. SELECTION COMMITTEE**

The school district has established a Selection Committee to evaluate provider proposals consisting of their Buildings and Grounds Committee with final approval by the full school board. The evaluation of each proposal will be based on technical criteria and qualifications, reference checks, and other information that will be gathered independently.

### **XV. SCHOOL DISTRICT RESPONSIBILITY**

The school district will be responsible for the following:

- Providing all available existing relevant plans and records.
- Coordinating access to the site for review before the bid due date.

### **XVI. PROVIDER SELECTION CRITERIA**

The school district, based on the requirements of this RFP has designated the following items as selection criteria for the successful provider that provides the best value to the district. Each item will be individually and separately scored by the District. For the purposes of this construction project, the best value describes the result determined by a procurement method that considers price and other criteria, which may include, but are not limited to the following per [Minnesota State Statute 16C.28](#):





<b>Criteria</b>	<b>Scoring Guidelines</b>	<b>Points</b>
Price	<i>Points based on pricing relative to competitors</i>	20 points
	- Lowest price offered: 20 points	
	- Second lowest price: 15 points	
	- Third lowest price: 10 points	
	- All others: 5 points	
Quality of Performance on Previous Projects	<i>Points based on quality assessments from past projects;</i>	18 points
	- Consistently exceeds expectations (e.g., exceptional workmanship, no defects/issues): 18 points	
	- Meets expectations consistently with minimal issues: 14 points	
	- Meets expectations but with moderate issues resolved satisfactorily: 10 points	
	- Below expectations or unresolved issues: 6 points	
Timeliness of Performance on Previous Projects	<i>Points based on punctuality and adherence to timelines on past projects:</i>	16 points
	- Consistently delivers ahead of schedule: 16 points	
	- Consistently meets agreed timelines: 12 points	



	- Occasionally misses timelines but recovers quickly: 8 points	
Customer Satisfaction	<i>Points based on client feedback and satisfaction ratings</i>	14 points
	- Overwhelmingly positive feedback with no complaints: 14 points	
	- Generally positive feedback with minor complaints resolved: 10 points	
	- Mixed feedback with some unresolved complaints: 6 points	
	- Predominantly negative feedback: 2 points	
Record of Staying on Budget	<i>Points based on adherence to budget constraints in past projects;</i>	12 points
	- Consistently delivers within budget without overruns: 12 points	
	- Delivers within budget with minor overruns (less than 5%): 8 points	
	- Regularly exceeds budget by moderate amounts (5-10%): 4 points	
	- Frequently exceeds budget by significant amounts (10%+): 0 points	
Minimization of Change Orders	<i>Points based on the ability to avoid unnecessary changes to project scope:</i>	4 points
	- No change orders on past projects: 4	



	points	
	- Minimal change orders with strong justification: 3 points	
	- Frequent or unnecessary change orders: 0 points	
Project Planning Skills	<i>Points based on the quality of project plans submitted in past work:</i>	4 points
	- Highly detailed and comprehensive plans: 4 points	
	- Adequate plans with minor gaps: 3 points	
	- Plans lacking detail or clarity: 2 points	
	- No formal project plans provided: 0 points	
Technical Capabilities	<i>Points based on technical expertise and capabilities</i>	4 points
	- Extensive technical expertise with a proven track record: 4 points	
	- Adequate expertise for most project requirements: 3 points	
	- Limited expertise, potential gaps in capabilities: 2 points	
	- Insufficient technical expertise: 0 points	



Qualifications of Key Personnel	<i>Points based on the qualifications and experiences of the contractor's key team members.</i>	4 points
	- Highly qualified team with significant relevant experience: 4 points	
	- Qualified team with moderate relevant experiences: 3 points	
	- Team with limited qualifications or experience: 2 points	
	- Unqualified or inexperienced team: 0 points	
Risk Assessment and Minimization	<i>Points based on the ability to identify and mitigate risks effectively:</i>	4 points
	- Comprehensive risk assessment with mitigation plans: 4 points	
	- Basic risk assessment with some mitigation plans: 3 points	
	- Limited risk assessment with vague mitigation plans: 2 points	
	- No risk assessment or mitigation plans: 0 points	
	<b>Total Points</b>	

## **XVII. RIGHT TO REJECT PROPOSALS**

Bid proposals shall remain valid for 60 days after the opening of the proposals.

The school district reserves the right to reject any or all proposals.





All costs incurred in the preparation of the proposal, the submission of additional information, and/or any aspect of a proposal before the award of a written contract will be borne by the provider.

The school district will provide only the staff assistance and documentation specifically referred to herein and will not be responsible for any other cost or obligation of any kind that may be incurred by the respondent. All proposals submitted become the property of the school district.

#### **XVIII. RFP EXHIBITS**

ATTACHMENT A:	MN Solar Suitability App report
ATTACHMENT B:	PVWatts Report
ATTACHMENT C:	24 Months of Utility Bills
ATTACHMENT D:	Map of Proposed Location



# **ATTACHMENT A**



# Solar Suitability Report

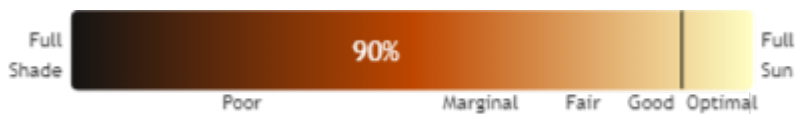
Latitude: 45.152805 Longitude: -95.005127

[mn.gov/solarapp](https://mn.gov/solarapp)

Wed Jul 10, 2024

## ISD 347 Willmar - Willmar Senior High

2701 30th St NE, Willmar MN 56201



This site is **Optimal**. It would need a **4.72 kW** system to generate **50%** of average household use. This system would cost approximately **\$17,683**. System payback is **12.9 years** after tax credit.

### Utility Service Provider:

Willmar Municipal Utilities

700 SW Litchfield Ave., P.O. Box 937

Willmar, MN 56201

(320) 235-4422

[www.wmu.willmar.mn.us](http://www.wmu.willmar.mn.us)

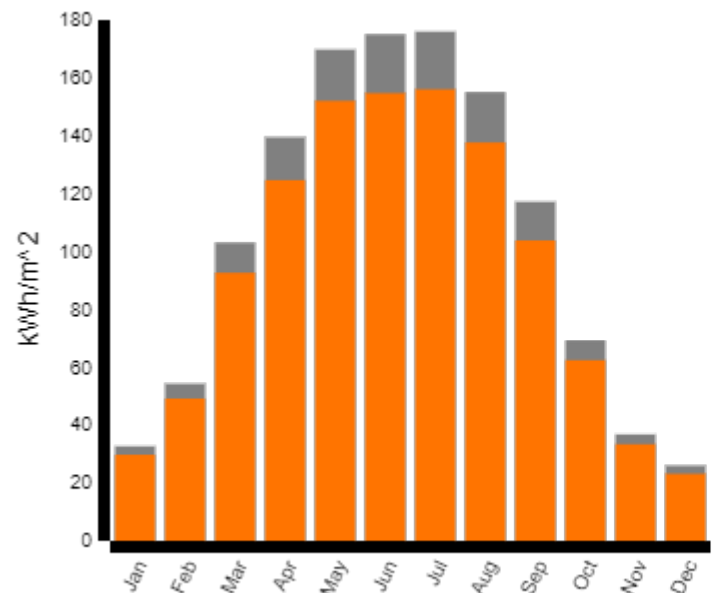
### Site Details:

Total Annual Insolation: 1185.15 kWh/m<sup>2</sup>

Avg Insolation per Day: 3.25 kWh/m<sup>2</sup>

Source Data: Spring and Fall 2010

## Amount Actual Sun



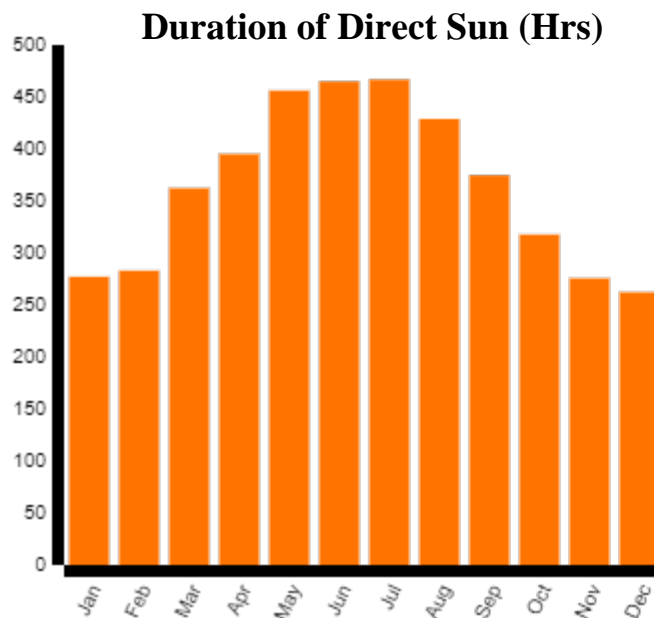
## Solar Calculator

User Input	Value	Tips and Notes
Average utility use (per month)	800 kWh	The average residential household uses 800 kWh/month. If you know your monthly usage, fill it in here.
Cost / kWh	\$0.12/kWh	Minnesota's average residential cost of electricity is \$0.12/kWh. If you know your cost of electricity enter it here.
Percent of electricity provided by solar	50%	Experiment with different percentages here to see how system cost varies. Think about how energy efficiency improvements bring down the cost of your solar system.

Outputs	Value	Tips and Notes
Size of system needed	4.72 kW	Result is based on values provided for monthly electricity use and desired percentage covered by solar. It also includes a derate of 0.87. A factor accounting for conversion of the array's DC nameplate capacity to the system's AC power rating at Standard Test Condition.
System cost estimate	\$17,683	Result is based on an average 2020 Minnesota residential system cost of \$3,750 per kW. Costs will vary depending on the specifics of your system.
Payback without incentives	17.38 years	Result assumes that electricity costs will rise 3.5% each year over 25 years.
Payback with Tax Credit	12.86 years	Your system may be eligible for a federal tax credit. This result shows the payback of your system with the 26% tax credit applied.

Month	Actual % Sun**	Total kWh/m2	Duration (Hrs)
January	91%	29.76	277.2
February	91%	49.18	283.0
March	90%	92.64	362.4
April	89%	124.66	395.2
May	90%	152.07	456.2
June	88%	154.73	465.0
July	89%	156.04	466.7
August	89%	137.66	428.9
September	89%	103.82	374.7
October	90%	62.43	317.7
November	91%	33.38	275.7
December	89%	23.15	262.3

\*\*These percentages should be used as the monthly shading derate factors % on the Xcel Solar Rewards application



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# Solar Suitability Report

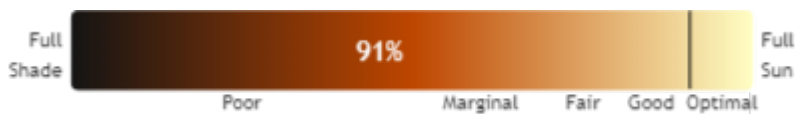
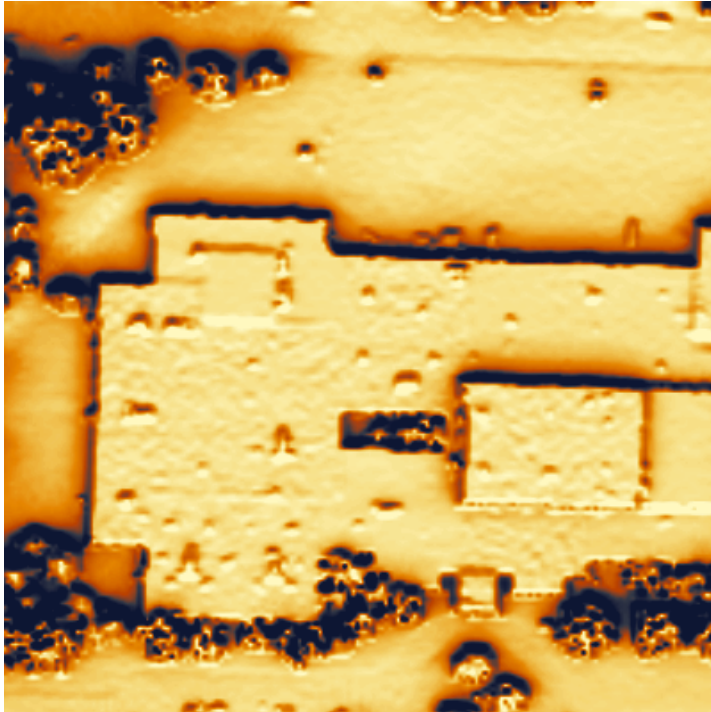
Latitude: 45.112358 Longitude: -95.039914

[mn.gov/solarapp](https://mn.gov/solarapp)

Wed Jul 10, 2024

## ISD 347 Willmar - Willmar Middle School

301 Willmar Ave SE, Willmar MN 56201



This site is **Optimal**. It would need a **4.59 kW** system to generate **50%** of average household use. This system would cost approximately **\$17,206**. System payback is **12.5 years** after tax credit.

### Utility Service Provider:

Willmar Municipal Utilities

700 SW Litchfield Ave., P.O. Box 937

Willmar, MN 56201

(320) 235-4422

[www.wmu.willmar.mn.us](http://www.wmu.willmar.mn.us)

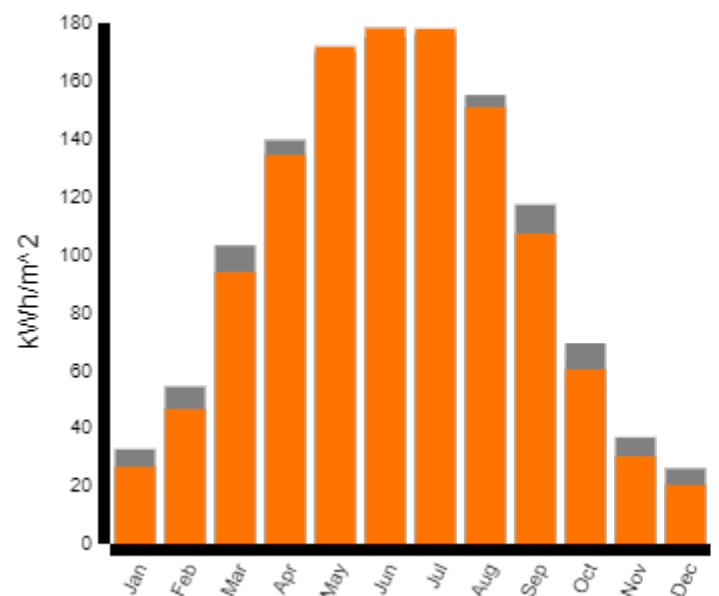
### Site Details:

Total Annual Insolation: 1219.77 kWh/m<sup>2</sup>

Avg Insolation per Day: 3.34 kWh/m<sup>2</sup>

Source Data: Spring and Fall 2010

## Amount Actual Sun



## Solar Calculator

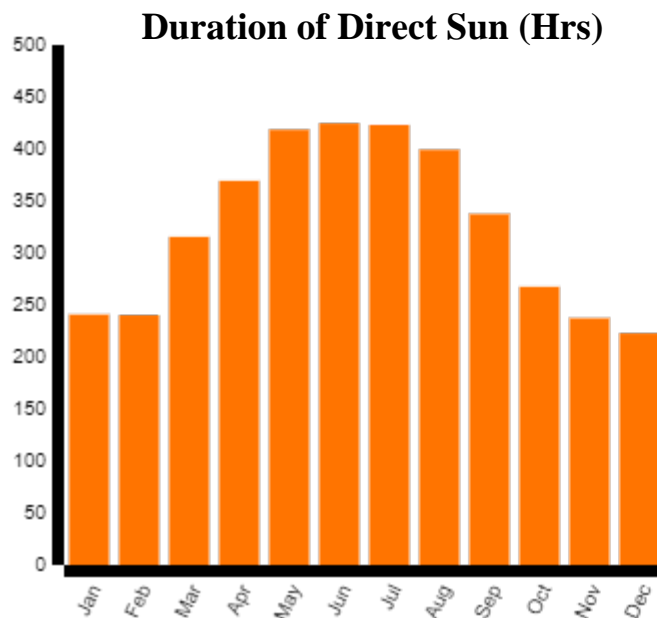
User Input	Value	Tips and Notes
Average utility use (per month)	800 kWh	The average residential household uses 800 kWh/month. If you know your monthly usage, fill it in here.
Cost / kWh	\$0.12/kWh	Minnesota's average residential cost of electricity is \$0.12/kWh. If you know your cost of electricity enter it here.
Percent of electricity provided by solar	50%	Experiment with different percentages here to see how system cost varies. Think about how energy efficiency improvements bring down the cost of your solar system.

Outputs	Value	Tips and Notes
Size of system needed	4.59 kW	Result is based on values provided for monthly electricity use and desired percentage covered by solar. It also includes a derate of 0.87. A factor accounting for conversion of the array's DC nameplate capacity to the system's AC power rating at Standard Test Condition.
System cost estimate	\$17,206	Result is based on an average 2020 Minnesota residential system cost of \$3,750 per kW. Costs will vary depending on the specifics of your system.
Payback without incentives	16.91 years	Result assumes that electricity costs will rise 3.5% each year over 25 years.
Payback with Tax Credit	12.51 years	Your system may be eligible for a federal tax credit. This result shows the payback of your system with the 26% tax credit applied.



Month	Actual % Sun**	Total kWh/m2	Duration (Hrs)
January	82%	26.76	240.8
February	86%	46.67	240.3
March	91%	94.02	315.5
April	96%	134.50	369.4
May	100%	171.89	418.7
June	100%	178.31	424.8
July	100%	178.05	423.1
August	97%	151.00	399.4
September	92%	107.32	337.5
October	87%	60.37	267.5
November	83%	30.36	237.4
December	79%	20.44	222.9

\*\*These percentages should be used as the monthly shading derate factors % on the Xcel Solar Rewards application



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# Solar Suitability Report

Latitude: 45.113378 Longitude: -95.019330

[mn.gov/solarapp](https://mn.gov/solarapp)

Wed Jul 10, 2024

## ISD 347 Willmar - Lakeland Elementary

1001 Lakeland Dr SE, Willmar MN 56201



This site is **Good**. It would need a **4.82 kW** system to generate **50%** of average household use. This system would cost approximately **\$18,072**. System payback is **13.1 years** after tax credit.

### Utility Service Provider:

Willmar Municipal Utilities

700 SW Litchfield Ave., P.O. Box 937

Willmar, MN 56201

(320) 235-4422

[www.wmu.willmar.mn.us](http://www.wmu.willmar.mn.us)

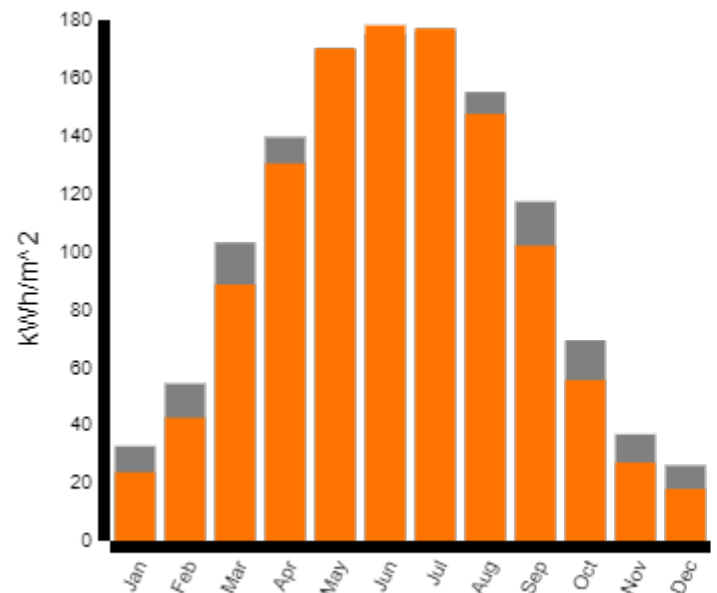
### Site Details:

Total Annual Insolation: 1160.58 kWh/m<sup>2</sup>

Avg Insolation per Day: 3.18 kWh/m<sup>2</sup>

Source Data: Spring and Fall 2010

## Amount Actual Sun



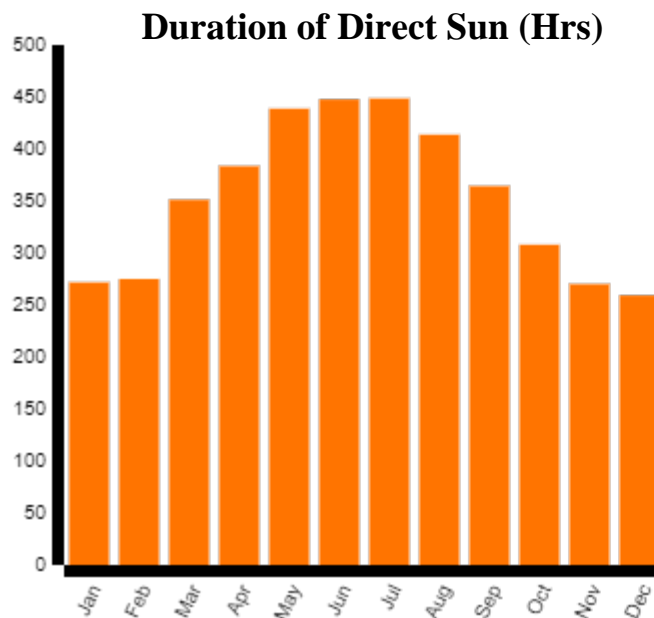
## Solar Calculator

User Input	Value	Tips and Notes
Average utility use (per month)	800 kWh	The average residential household uses 800 kWh/month. If you know your monthly usage, fill it in here.
Cost / kWh	\$0.12/kWh	Minnesota's average residential cost of electricity is \$0.12/kWh. If you know your cost of electricity enter it here.
Percent of electricity provided by solar	50%	Experiment with different percentages here to see how system cost varies. Think about how energy efficiency improvements bring down the cost of your solar system.

Outputs	Value	Tips and Notes
Size of system needed	4.82 kW	Result is based on values provided for monthly electricity use and desired percentage covered by solar. It also includes a derate of 0.87. A factor accounting for conversion of the array's DC nameplate capacity to the system's AC power rating at Standard Test Condition.
System cost estimate	\$18,072	Result is based on an average 2020 Minnesota residential system cost of \$3,750 per kW. Costs will vary depending on the specifics of your system.
Payback without incentives	17.76 years	Result assumes that electricity costs will rise 3.5% each year over 25 years.
Payback with Tax Credit	13.14 years	Your system may be eligible for a federal tax credit. This result shows the payback of your system with the 26% tax credit applied.

Month	Actual % Sun**	Total kWh/m2	Duration (Hrs)
January	72%	23.71	271.8
February	78%	42.52	275.0
March	86%	88.60	351.3
April	93%	130.42	383.6
May	100%	170.28	438.8
June	100%	178.15	447.8
July	100%	177.13	448.6
August	95%	147.55	413.8
September	87%	102.01	364.4
October	80%	55.53	308.0
November	74%	27.06	270.2
December	69%	17.93	259.3

\*\*These percentages should be used as the monthly shading derate factors % on the Xcel Solar Rewards application



This service made possible by:

**m<sup>1</sup>** **COMMERCE**  
**DEPARTMENT**  
ENERGY RESOURCES



# Solar Suitability Report

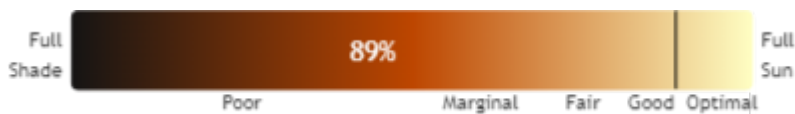
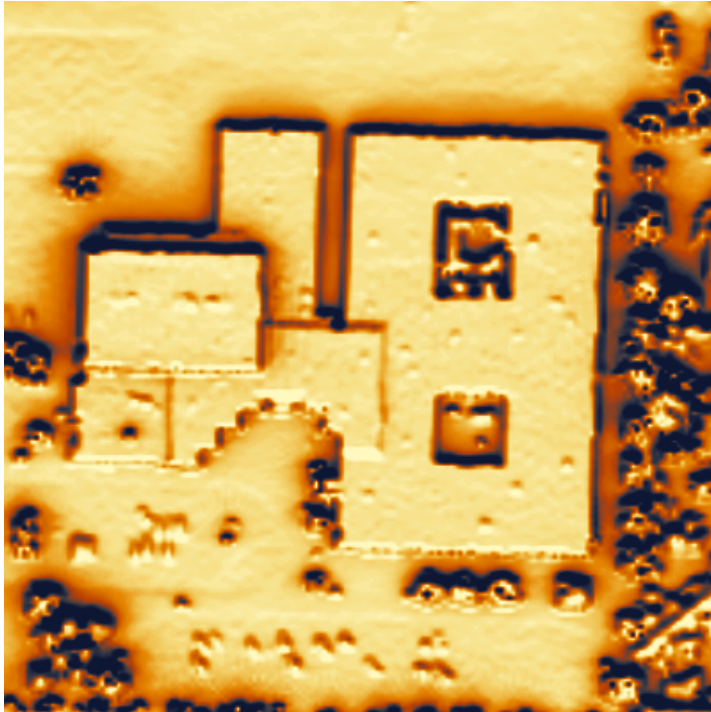
Latitude: 45.104382 Longitude: -95.066972

[mn.gov/solarapp](https://mn.gov/solarapp)

Wed Jul 10, 2024

## ISD 347 Willmar - Roosevelt Elementary

1800 19th Ave SW, Willmar MN 56201



This site is **Good**. It would need a **4.96 kW** system to generate **50%** of average household use. This system would cost approximately **\$18,599**. System payback is **13.5 years** after tax credit.

### Utility Service Provider:

Willmar Municipal Utilities

700 SW Litchfield Ave., P.O. Box 937

Willmar, MN 56201

(320) 235-4422

[www.wmu.willmar.mn.us](http://www.wmu.willmar.mn.us)

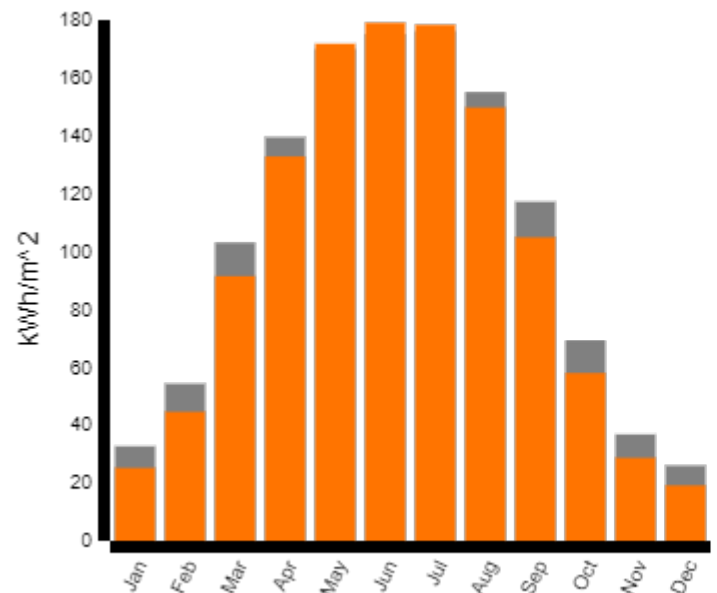
### Site Details:

Total Annual Insolation: 1126.72 kWh/m<sup>2</sup>

Avg Insolation per Day: 3.09 kWh/m<sup>2</sup>

Source Data: Spring and Fall 2010

## Amount Actual Sun



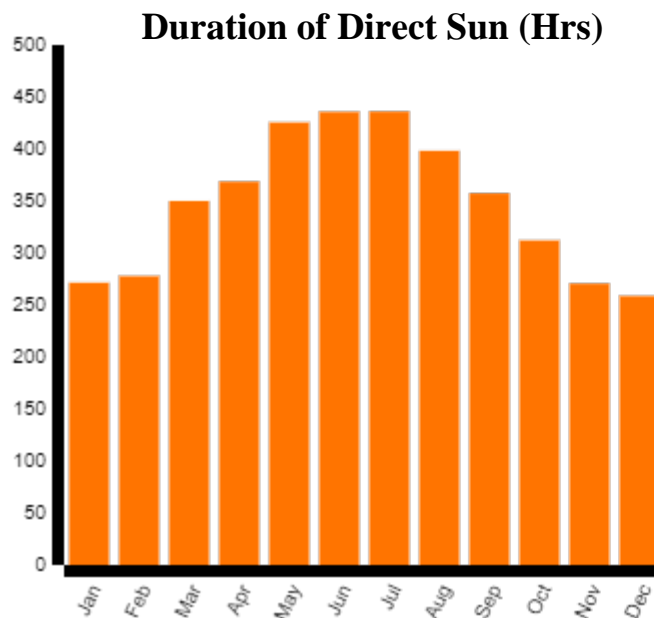
## Solar Calculator

User Input	Value	Tips and Notes
Average utility use (per month)	800 kWh	The average residential household uses 800 kWh/month. If you know your monthly usage, fill it in here.
Cost / kWh	\$0.12/kWh	Minnesota's average residential cost of electricity is \$0.12/kWh. If you know your cost of electricity enter it here.
Percent of electricity provided by solar	50%	Experiment with different percentages here to see how system cost varies. Think about how energy efficiency improvements bring down the cost of your solar system.

Outputs	Value	Tips and Notes
Size of system needed	4.96 kW	Result is based on values provided for monthly electricity use and desired percentage covered by solar. It also includes a derate of 0.87. A factor accounting for conversion of the array's DC nameplate capacity to the system's AC power rating at Standard Test Condition.
System cost estimate	\$18,599	Result is based on an average 2020 Minnesota residential system cost of \$3,750 per kW. Costs will vary depending on the specifics of your system.
Payback without incentives	18.28 years	Result assumes that electricity costs will rise 3.5% each year over 25 years.
Payback with Tax Credit	13.53 years	Your system may be eligible for a federal tax credit. This result shows the payback of your system with the 26% tax credit applied.

Month	Actual % Sun**	Total kWh/m2	Duration (Hrs)
January	77%	25.19	271.5
February	82%	44.59	277.8
March	89%	91.49	350.0
April	95%	132.85	368.7
May	100%	171.82	425.6
June	100%	179.10	435.8
July	100%	178.40	436.1
August	97%	149.77	398.3
September	90%	104.90	357.5
October	84%	57.98	312.1
November	78%	28.68	270.7
December	74%	19.15	258.7

\*\*These percentages should be used as the monthly shading derate factors % on the Xcel Solar Rewards application



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DEPARTMENT**  
ENERGY RESOURCES

# **ATTACHMENT B**





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The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

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The energy output range is based on analysis of 30 years of historical weather data, and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

73,505 kWh/Year\*

System output may range from 69,014 to 75,828 kWh per year near this location.

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	2.27	3,448
February	3.52	4,822
March	4.48	6,516
April	5.29	7,154
May	6.12	8,300
June	6.94	8,995
July	7.02	9,230
August	6.02	8,006
September	4.81	6,389
October	3.38	4,850
November	2.22	3,149
December	1.79	2,646
Annual	4.49	73,505

Location and Station Identification

Requested Location	2701 30th St NE, Willmar, MN		
Weather Data Source	Lat, Lng: 45.17, -95.02	1.6 mi	
Latitude	45.17° N		
Longitude	95.02° W		

PV System Specifications

DC System Size	59.52 kW					
Module Type	Standard					
Array Type	Fixed (open rack)					
System Losses	20.09%					
Array Tilt	10°					
Array Azimuth	225°					
DC to AC Size Ratio	1.49					
Inverter Efficiency	98%					
Ground Coverage Ratio	0.4					
Albedo	From weather file					
Bifacial	Yes (0.7)					
Monthly Irradiance Loss	Jan	Feb	Mar	Apr	May	June
	0%	0%	0%	0%	0%	0%
Monthly Irradiance Loss	July	Aug	Sept	Oct	Nov	Dec
	0%	0%	0%	0%	0%	0%

Performance Metrics

DC Capacity Factor	14.1%
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The energy output range is based on analysis of 30 years of historical weather data, and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

74,769 kWh/Year\*

System output may range from 70,201 to 77,132 kWh per year near this location.

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	2.52	3,842
February	3.73	5,025
March	4.51	6,451
April	5.42	7,291
May	6.11	8,235
June	6.98	8,986
July	7.19	9,397
August	6.09	8,084
September	4.74	6,317
October	3.25	4,632
November	2.47	3,544
December	1.98	2,964
Annual	4.58	74,768

Location and Station Identification

Requested Location	301 Willmar Ave SE, Willmar, MN 56201
Weather Data Source	Lat, Lng: 45.13, -95.06    1.6 mi
Latitude	45.13° N
Longitude	95.06° W

PV System Specifications

DC System Size	59.52 kW
Module Type	Standard
Array Type	Fixed (open rack)
System Losses	20.09%
Array Tilt	10°
Array Azimuth	180°
DC to AC Size Ratio	1.49
Inverter Efficiency	98%
Ground Coverage Ratio	0.4
Albedo	From weather file
Bifacial	Yes (0.7)
Monthly Irradiance Loss	Jan   Feb   Mar   Apr   May   June 0%   0%   0%   0%   0%   0%
	July   Aug   Sept   Oct   Nov   Dec 0%   0%   0%   0%   0%   0%

Performance Metrics

DC Capacity Factor	14.3%
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The energy output range is based on analysis of 30 years of historical weather data, and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

74,875 kWh/Year\*

System output may range from 70,300 to 77,241 kWh per year near this location.

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	2.50	3,813
February	3.73	5,034
March	4.68	6,598
April	5.42	7,283
May	6.09	8,209
June	6.99	8,994
July	7.07	9,254
August	6.06	8,039
September	4.95	6,584
October	3.26	4,652
November	2.40	3,440
December	1.99	2,976
Annual	4.60	74,876

Location and Station Identification

Requested Location	1001 Lakeland Dr SE, Willmar, MN 56201
Weather Data Source	Lat, Lng: 45.13, -95.02    1.1 mi
Latitude	45.13° N
Longitude	95.02° W

PV System Specifications

DC System Size	59.52 kW
Module Type	Standard
Array Type	Fixed (open rack)
System Losses	20.09%
Array Tilt	10°
Array Azimuth	180°
DC to AC Size Ratio	1.49
Inverter Efficiency	98%
Ground Coverage Ratio	0.4
Albedo	From weather file
Bifacial	Yes (0.7)
Monthly Irradiance Loss	Jan   Feb   Mar   Apr   May   June 0%   0%   0%   0%   0%   0%
	July   Aug   Sept   Oct   Nov   Dec 0%   0%   0%   0%   0%   0%

Performance Metrics

DC Capacity Factor	14.4%
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The energy output range is based on analysis of 30 years of historical weather data, and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

75,733 kWh/Year\*

System output may range from 71,106 to 78,126 kWh per year near this location.

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	2.54	3,919
February	3.82	5,150
March	4.53	6,478
April	5.48	7,292
May	6.16	8,299
June	7.05	9,071
July	7.12	9,315
August	6.22	8,248
September	4.95	6,570
October	3.29	4,684
November	2.45	3,501
December	2.09	3,208
Annual	4.64	75,735

Location and Station Identification

Requested Location	1800 19th Ave SW, Willmar, MN 56201
Weather Data Source	Lat, Lng: 45.09, -95.06    1.0 mi
Latitude	45.09° N
Longitude	95.06° W

PV System Specifications

DC System Size	59.52 kW
Module Type	Standard
Array Type	Fixed (open rack)
System Losses	20.09%
Array Tilt	10°
Array Azimuth	180°
DC to AC Size Ratio	1.49
Inverter Efficiency	98%
Ground Coverage Ratio	0.4
Albedo	From weather file
Bifacial	Yes (0.7)
Monthly Irradiance Loss	Jan   Feb   Mar   Apr   May   June 0%   0%   0%   0%   0%   0%
	July   Aug   Sept   Oct   Nov   Dec 0%   0%   0%   0%   0%   0%

Performance Metrics

DC Capacity Factor	14.5%
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# **ATTACHMENT C**

**Customer Name: ISD 347 Willmar - Senior High**  
**Address: 2701 30th St NE, Willmar, MN 56201**  
**Acct # 01-21907016-001**  
**24 Month Usage Summary**

<b>Meter # 90000184</b>	<b>Read Dates</b>	<b>Usage (kWh)</b>
	7/30/2022	314100
	8/30/2022	309600
	9/30/2022	321300
	10/30/2022	294300
	11/30/2022	297900
	12/30/2022	326700
	1/30/2023	325800
	2/28/2023	297900
	3/30/2023	326700
	4/30/2023	302400
	5/30/2023	324900
	6/30/2023	324900
<b>Total kWh for Year</b>		<b>3766500</b>

<b>Meter # 90000184</b>	<b>Read Dates</b>	<b>Usage (kWh)</b>
	7/30/2023	319500
	8/30/2023	333000
	9/30/2023	337500
	10/30/2023	306900
	11/28/2023	268200
	12/30/2023	342000
	1/30/2024	326700
	2/28/2024	287100
	3/25/2024	243000
	5/1/2024	352800
	6/1/2024	310500
	7/1/2024	268200
<b>Total kwh for Year</b>		<b>3695400</b>

**Average Yearly Electricity Use:**

**3730950**

**Customer Name: ISD 347 Willmar - Middle School**  
**Address: 301 Willmar Ave SE, Willmar, MN 56201**  
**Acct # 01-21907011-001**  
**24 Month Usage Summary**

<b>Meter # 90000074</b>	<b>Read Dates</b>	<b>Usage (kWh)</b>
	7/30/2022	185760
	8/30/2022	168960
	9/30/2022	165360
	10/30/2022	127200
	11/30/2022	122640
	12/30/2022	118320
	1/30/2023	124080
	2/28/2023	112320
	3/30/2023	125520
	4/30/2023	119760
	5/30/2023	160080
	6/30/2023	189840
<b>Total kWh for Year</b>		<b>1719840</b>

<b>Meter # 90000074</b>	<b>Read Dates</b>	<b>Usage (kWh)</b>
	7/30/2023	204000
	8/30/2023	202560
	9/30/2023	168480
	10/30/2023	129360
	11/28/2023	108960
	12/30/2023	138000
	1/30/2024	134400
	2/28/2024	125280
	3/25/2024	105600
	5/1/2024	145680
	6/1/2024	148560
	7/1/2024	150720
<b>Total kwh for Year</b>		<b>1761600</b>

**Average Yearly Electricity Use:**

**1740720**

**Customer Name: ISD 347 Willmar - Lakeland Elementary**  
**Address: 1001 Lakeland Dr SE, Willmar, MN 56201**  
**Acct # 01-21907021-001**  
**24 Month Usage Summary**

<b>Meter # 90000160</b>	<b>Read Dates</b>	<b>Usage (kWh)</b>
	7/30/2022	109200
	8/30/2022	108600
	9/30/2022	98400
	10/30/2022	73800
	11/30/2022	75000
	12/30/2022	76200
	1/30/2023	79200
	2/28/2023	70800
	3/30/2023	78000
	4/30/2023	74400
	5/30/2023	90600
	6/30/2023	103200
<b>Total kWh for Year</b>		<b>1037400</b>

	<b>Read Dates</b>	<b>Usage (kWh)</b>
	7/30/2023	87600
	8/30/2023	102600
	9/30/2023	81600
	10/30/2023	64200
	11/28/2023	56400
	12/30/2023	70800
	1/30/2024	71400
	2/28/2024	61200
	3/25/2024	51600
	5/1/2024	72600
	6/1/2024	70200
	7/1/2024	73200
<b>Total kwh for Year</b>		<b>863400</b>

**Average Yearly Electricity Use:**

**950400**

**Customer Name: ISD 347 Willmar - Roosevelt Elementary**  
**Address: 1800 19th Ave SW, Willmar, MN 56201**  
**Acct # 01-21907012-001**  
**24 Month Usage Summary**

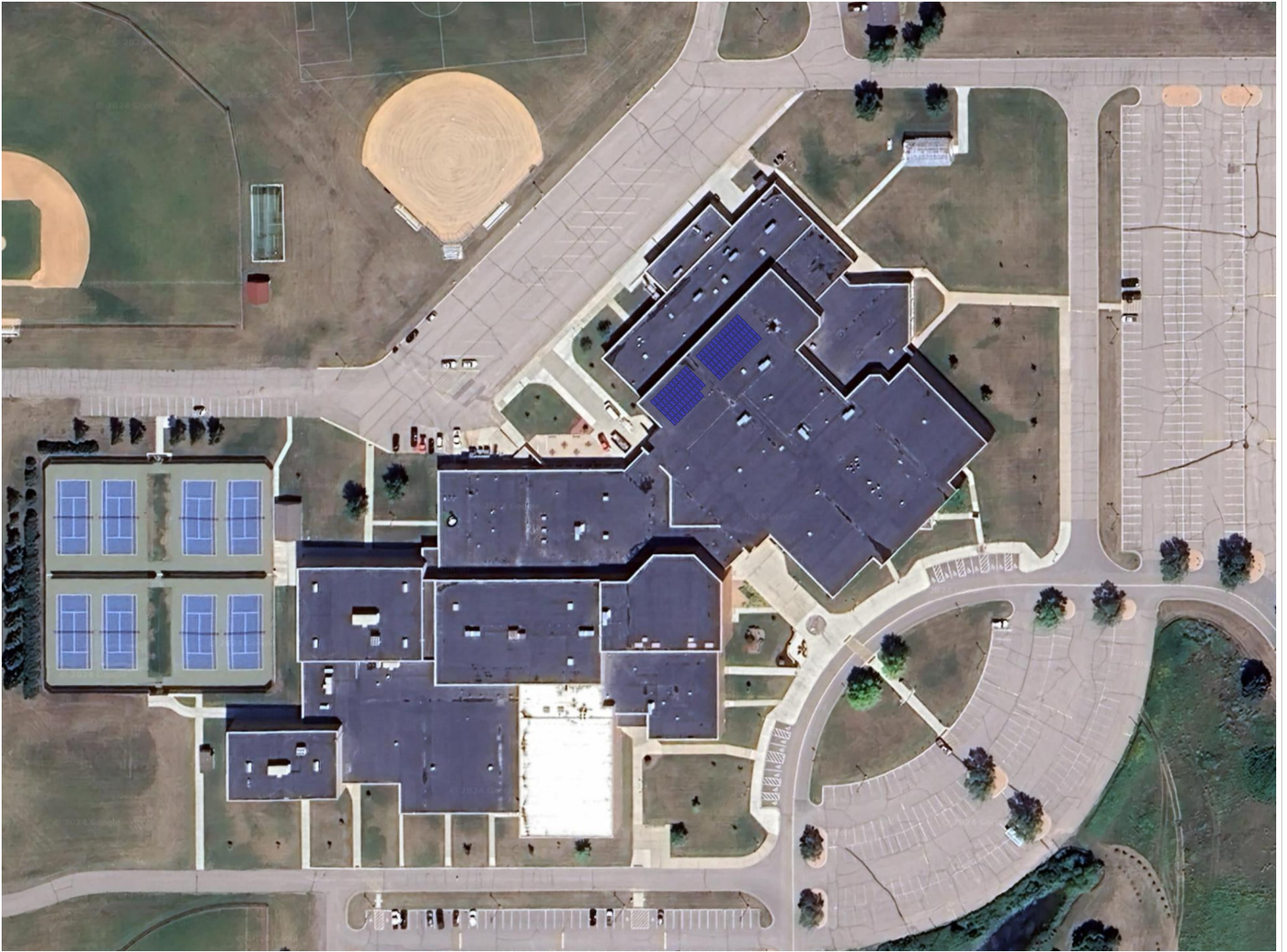
<b>Meter # 36000023</b>	<b>Read Dates</b>	<b>Usage (kWh)</b>
	7/30/2022	49200
	8/30/2022	49800
	9/30/2022	59800
	10/30/2022	58400
	11/30/2022	58800
	12/30/2022	59600
	1/30/2023	58200
	2/28/2023	54200
	3/30/2023	60600
	4/30/2023	55600
	5/30/2023	58000
	6/30/2023	48000
<b>Total kWh for Year</b>		<b>670200</b>

	<b>Read Dates</b>	<b>Usage (kWh)</b>
	7/30/2023	41400
	8/30/2023	51200
	9/30/2023	54000
	10/30/2023	55600
	11/28/2023	48600
	12/30/2023	62200
	1/30/2024	62200
	2/28/2024	56400
	3/25/2024	48200
	5/1/2024	66400
	6/1/2024	52600
	7/1/2024	36800
<b>Total kwh for Year</b>		<b>635600</b>

**Average Yearly Electricity Use:**

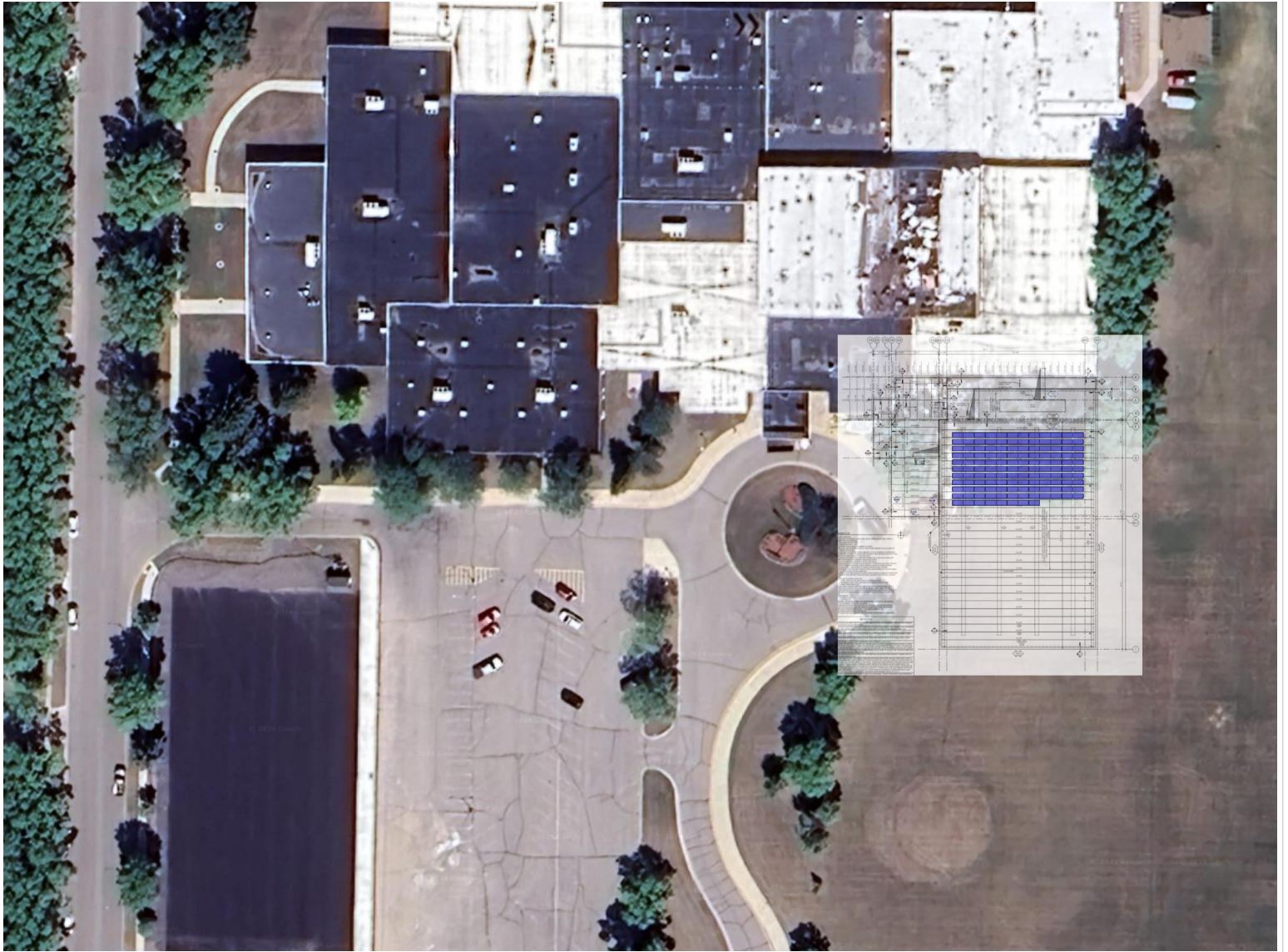
**652900**

# **ATTACHMENT D**



Willmar Senior High School





Willmar Middle School





Lakeland Elementary



Roosevelt Elementary