PSC of WISCONSIN

OEI
Wisconsin Office of Energy Innovation

Public Service Commission of Wisconsin
Office of Energy Innovation
Critical Infrastructure Microgrid and
Community Resilience Center Pilot Grant
Program

ATTACHMENT A - COVER SHEET

SECTION I - Provide information summarizing the project proposal.				
Project Title:	Sauk Prairie Police Commission Emergency Operation Center			
PSC Grant Request ($):	**Applicant Cost Share ($):**	**Project Total ($):**		
$50,000	$34,500	$84,500		
Choose one Eligible Activity				
□ Critical Infrastructure Microgrid Feasibility Study Level 1 and 2	□Critical Infrastructure Microgrid Feasibility Study Level 3	X Community Resilience Center Feasibility Study		
SECTION II - Provide information for your organization, signatory, and primary contact for the project.				
Applicant Type:	□ City	X Village	□ Town	□ County
□ Tribal Nation	□ Wisconsin Technical College System			
□ University of Wisconsin System	□ K-12 School District	□ 501(c)(3) nonprofit		
□ Municipal Utility (water, wastewater, electric, natural gas)	□ Hospital (public or nonprofit)			
Name (on W-9):	Sauk Prairie Police Commission			
Address (on W-9):	726 Water Street, Suite A, Sauk City WI 53583			
County or Counties Served by Project:	Sauk County			
DUNS Number or CAGE Code:	084171698			
NAICS Code:	922120			
Authorized Representative/Signatory (Person authorized to submit applications and sign contracts)		**Primary Contact** (if different from Authorized Representative)		
Name:	Paul Dietmann	**Name:**	Jerry Strunz	
Title:	Police Commission President	**Title:**	Chief of Police	
Phone:	608-963-7763	**Phone:**	608-643-2427	
E-mail:	Paul.dietmann@compeer.com	**E-mail:**	jerrys@saukprairiepd.com	
Signature of the Authorized Representative				

PSC REF#:418059

Public Service Commission of Wisconsin
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Sauk Prairie Police Commission

Sauk Prairie Police Commission Emergency Ops Center

Summary of Project Budget				
Line	**Description**	**PSC Grant Request**	**Applicant Cost Share**	**Total Project Cost**
1	Personnel		$22,500	$22,500
2	Fringe			$0
5	Travel			$0
6	Contractual	$50,000	$12,000	$62,000
7	Other			$0
8	Indirect			$0
	Totals	$50,000	$34,500	$84,500
	% of Total	**59%**	**41%**	

Applicant Comments:

Sauk Prairie Police Commission (applicant): Cost Share = $5,000 (50 hours of in-kind labor at an estimated $100/hr blended rate), Grant Request = $50,000 (to fund contract with SEPA)

Village of Prairie du Sac Electric Utility: Cost Share = $7,500 (75 hours of in-kind labor at an estimated $100/hr blended rate)

SEPA: Cost Share = $12,000 (industry outreach), Grant Request = $0 ($50,000 contract through applicant)

WPPI: Cost Share = $5,000 (50 hours of in-kind labor at an estimated $100/hr blended rate)

MSA Professional Services: Cost Share = $5,000 (50 hours of in-kind labor at an estimated $100/hr blended rate)

1.0 Project Description

The Sauk Prairie Police Commission (the "Commission") was formed in August of 1949 to oversee the operations of the joint police department for the Villages of Prairie du Sac and Sauk City WI, which have a combined population of 7,627.

The Commission is currently in the process of building a new police station located at 640 13th Street in the Village of Prairie du Sac. The new police station will house an emergency operations center that will routinely be used by the Sauk Prairie Police Department, Prairie du Sac Fire Department, Sauk City Fire Department, Sauk Prairie EMS, Village of Prairie du Sac, and Village of Sauk City during major events, critical incidents, and man-made or natural disasters. The emergency operations center may also be used by other area emergency government or law enforcement agencies as needed, including Sauk County Sheriff's Department, Sauk County Emergency Government, and Sauk County Public Health Department. The new police station is currently under construction and has plans to include rooftop solar PV for energy cost savings. Our approach is to pursue a feasibility investigation of a microgrid for the new police station in order to evaluate enhancements and additions to the new police station to accommodate a microgrid.

There are several factors that are motivating a feasibility investigation of a microgrid.

- The main factor is that the emergency operations center at the new police station is critical for public safety. It is imperative that we build in redundant power capabilities to ensure that the police station and emergency operations center remain in service at all times. The emergency operation center will have radio communications capabilities, access to maps and live feed GPS coordinates of emergency responders, live feed video capabilities from area businesses and schools, and live feed weather and news reports that may help in mitigating emergency situations. The design for the new police station currently includes a large solar array on the roof of the police garage. It is anticipated that this solar array will help offset the costs of energy by approximately 50%, however, there is no current capability to store solar power for emergency use. The station will have a diesel generator available as backup during power outages, but this system is not as environmentally friendly as the solar option.
- The second motivating factor is that the Commission has a strong desire to be cognizant of the impact that we have on the environment. The Commission has shown a strong commitment to the use of solar energy and other energy efficiencies in the design of the new station. The Commission wants to reduce our carbon footprint as much as possible.
- The third motivating factor is that the Commission would like to lead by example. The new police station will serve as a model to area businesses and residents on how energy efficiencies including solar power can be incorporated into a building. This facility will serve as an educational tool that can be used by the Villages and WPPI as needed to educate people on solar capabilities.

2.0 Merit Review Criteria

Identification of Critical Infrastructure

The new police station will be utilized by the Sauk Prairie Police Department, Prairie du Sac Fire Department, Sauk Fire District and the Sauk Prairie EMS as an emergency operations center (EOC) during grid outages and other events. The Prairie du Sac Fire Department covers 2 square miles serving a population of 4,193.

Sauk Prairie EMS covers 196 square miles serving a base population of 14,983. They provide emergency medical services to the following municipalities (and percentage of area covered in each):

- Town of Honey Creek (62.5%)
- Village of Merrimac(100%)
- Town of Merrimac (100%)
- Village of Prairie du Sac (100%)
- Town of Prairie du Sac (100%))
- Town of Roxbury (100%)
- Village of Sauk City (100%)
- Town of Sumpter (90%)
- Town of Troy (42%)
- Town of West Point (50%)

Sauk City Area Fire District covers 175 square miles serving a base population of 10,000. They provide fire services to the following municipalities (and percentage of area covered in each):

- Village of Sauk City (100%)
- Roxbury (100%)
- West Point (50%)
- Prairie Du Sac (100%)
- Sumpter (100%)
- Honey Creek (63%)
- Troy (40%)

Key Partners and Stakeholders

The Commission plans on working directly with the Smart Electric Power Alliance (SEPA), who will lead the development of the microgrid feasibility study. Key partners to the project team will also include Village of Prairie du Sac Electric Utility, MSA Professional Services, Inc. (MSA) and WPPI Enrgy, Inc. (WPPI), as listed in Table 2.1. Other key stakeholders, listed in Table 2.2, will be engaged regularly throughout the development of the study.

*Table 2.1 - **Core Project Team and Responsibilities***

Project Partners	Responsibility	Role
Sauk Prairie Police Commission	Technical and strategic support	Applicant and microgrid customer
Village of Prairie du Sac Electric Utility	Technical and strategic support	Local electricity distribution utility
Smart Electric Power Alliance (SEPA)	Stakeholder engagement and technical assistance	Microgrid feasibility study lead
WPPI Energy, Inc.	Technical and strategic support	Electric wholesale supplier
MSA Professional Services, Inc.	Engineering and architectural support	New police station architect

Source: Smart Electric Power Alliance, 2021

*Table 2.2 - **Key Stakeholders and Responsibilities***

Key Stakeholders	Responsibility	Role
Village of Prairie du Sac	Technical and strategic support	Village covered by new police station
Forster Engineering	Engineering support	Village of Prairie du Sac's electrical engineer
Village of Sauk City	Technical and strategic support	Village covered by new police station
Prairie du Sac Fire Department	Strategic support	Emergency service accessing EOC
Sauk City Area Fire District	Strategic support	Emergency service accessing EOC
Sauk Prairie Ambulance	Strategic support	Emergency service accessing EOC
Sauk County Sheriff Department	Strategic support	Emergency service accessing EOC
Sauk County Grow Solar	Stakeholder/community perspective	Local solar developer

UW-Extension, poweredUp Baraboo	Stakeholder/community perspective	University
Midwest Renewable Energy Association	Stakeholder/community perspective	Regional renewable energy association

Source: Smart Electric Power Alliance, 2021

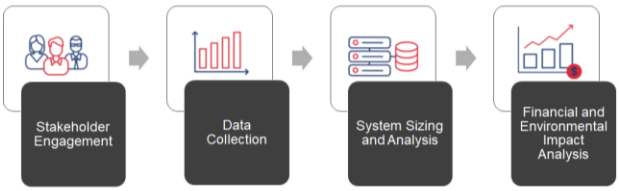
Project Resilience Objectives and Metrics

Extreme weather events threaten damage to the electrical system and disruption of power supply. These weather events are increasing both in frequency and economic impact in Wisconsin, causing prolonged outages, and disproportionately impacting underserved communities. This project presents the opportunity to collaborate with the community, propose and evaluate a solution to insulate critical services from the impacts of prolonged outages, and ultimately build community resilience. The study will identify a microgrid as a resiliency solution, develop microgrid designs that incorporate varying power supply technologies, and utilize stakeholder input to evaluate the feasibility of each microgrid design.

The feasibility study methodology included the following primary tasks completed by the project team:

1. **Stakeholder Engagement:** The project team will convene a group of key industry and community stakeholders to discuss the feasibility of a microgrid project at the Sauk Prairie Police Commission Emergency Operation Center.
2. **Data Collection:** The project team will collect community, utility, and energy consumption data relevant to the system sizing and financial and environmental impact analysis of a potential microgrid at the EOC.
3. **System Sizing and Analysis**: The project team will evaluate up to four (4) preliminary microgrid scenarios. Based on stakeholder feedback, the project team will conduct a detailed system design of one of the modeled scenarios. The sizing and analysis will consider the following resilience objectives and metrics:
    a. Critical electrical services: critical customer-hours of outages for the EOC
    b. Restoration: time to restore power to the EOC when the grid is down
    c. Community function: critical services without power and the ability to provide power to the EOC when the grid is down
4. **Financial and Environmental Impact Analysis**: The project team will conduct a benefit-cost analysis of one of the modeled scenarios to determine economic feasibility.

*Figure 2.0 - **Feasibility Study Methodology***



Source: Smart Electric Power Alliance, 2021

Evaluation of Site-Specific Information

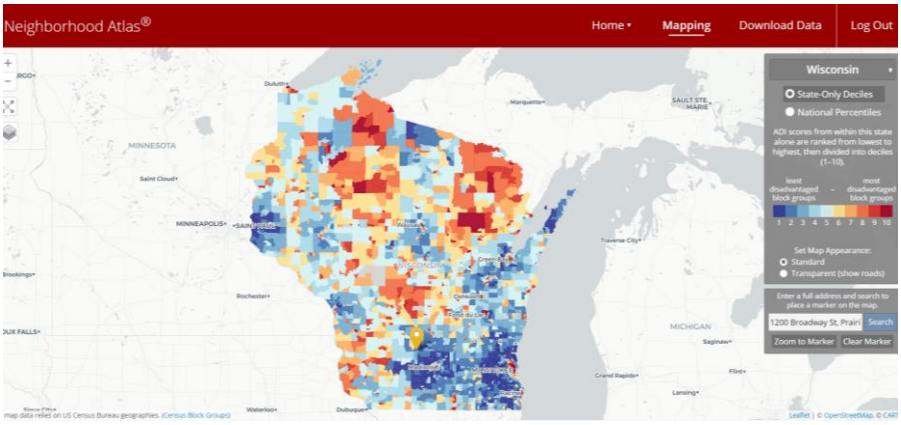
The new police station is located behind Bridges Elementary School at the corner of Prairie Street (County Hwy PF) and 13th Street as seen in Figure 2.1 below. The new building is currently under construction and to be approximately 22,000 square feet. The current proposed solar design plan calls for a 94.5 kW-DC solar PV installation to support local power needs on-site (see annual production report included as a reference). This proposed microgrid study would evaluate the feasibility of adding natural gas standby back-up generation, along with battery energy storage and microgrid controller functionality to allow for sustained islanding capabilities during a grid outage. MSA will participate in this study as the site's architect and has a comprehensive understanding of the permitting requirements. The study will address the impacts of retrofitting microgrid capabilities to the building's MEP systems.

*Figure 2.1 - **Site Boundaries and Aerial Imagery***

Source: Statewide Parcel Map Initiative, V7 Statewide Parcel Data (2021) and GeoData@Wisconsin, WROC Aerial Mosaic (WTM) Sauk County, WI 2020 (2020)

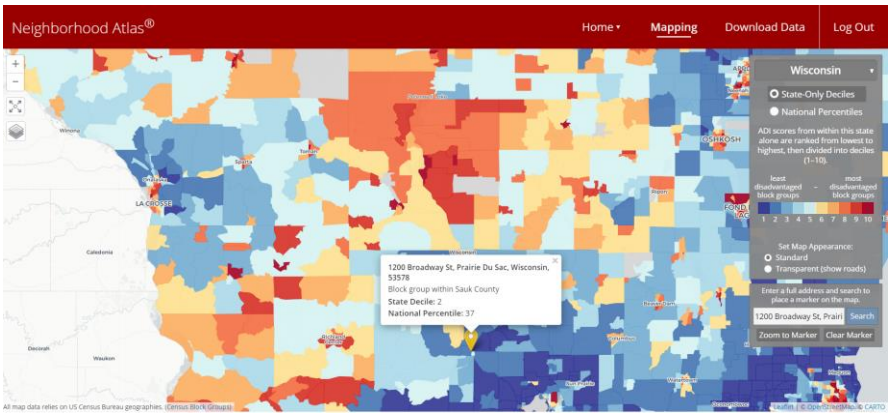
Figure 2.2 and 2.3 below show census block groups in Wisconsin categorized by their Area Deprivation Index score. The yellow marker on the map indicates the location of the site. The EOC site is near some of the most disadvantaged census block groups in the state.

Figure 2.2 - ***State View: Area Deprivation Index by Census Block Group***



Source: University of Wisconsin-Madison, Neighborhood Atlas Map (2021)

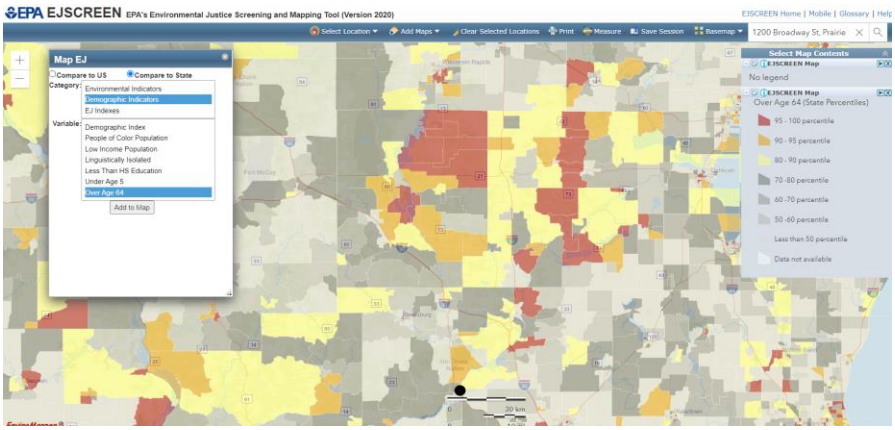
Figure 2.3 - ***Local View: Area Deprivation Index by Census Block Group***



Source: University of Wisconsin-Madison, Neighborhood Atlas Map (2021)

The EPA's Environmental Justice Screening and Mapping tool, highlighted in Figure 2.4 below, shows that the EOC site is located in an area where the percent of the population that is over the age of 64 is in the 70-100th percentile of the state, making this an intriguing site for equitable resilience benefits.

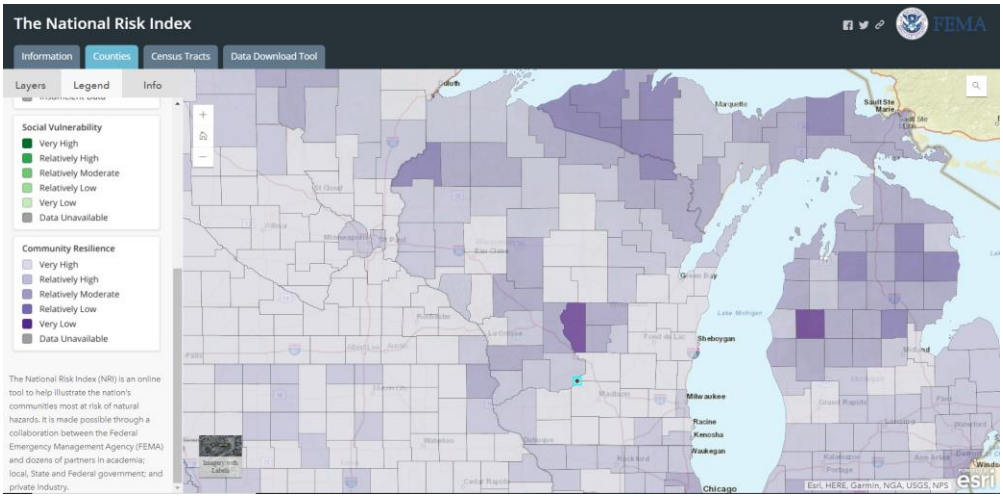
Figure 2.4 - ***Percentile of Population over 64 by Census Block***



Source: Environmental Protection Agency, EJSCREEN (2020)

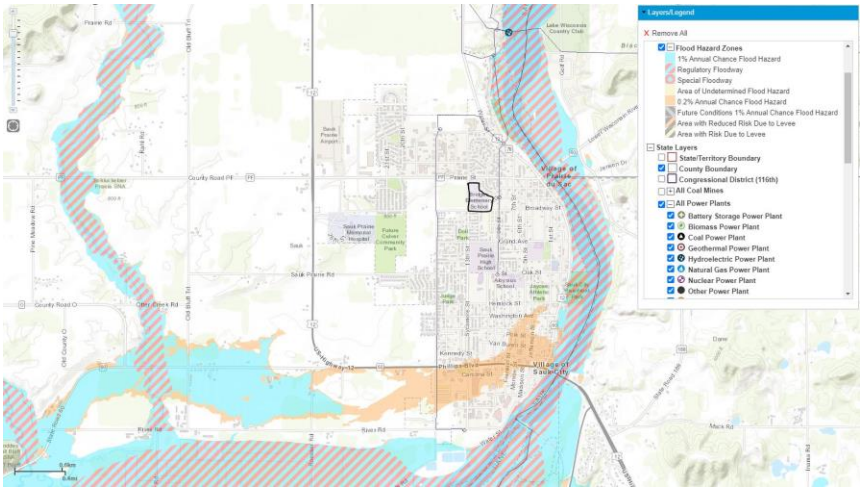
Figures 2.5 and 2.6 indicate the EOC site is located near a floodway and areas with 1% Annual Chance Flood Hazard and 0.2% Annual Chance Flood Hazard. The FEMA National Flood Hazard map also indicates where existing energy infrastructure is in relation to the EOC site. The site is surrounded by areas of high and medium flood hazard. A microgrid in this location may be ideal to support emergency services when critical infrastructure is inundated.

Figure 2.5 - ***Level of Community Resilience by County***



Source: FEMA, The National Risk Index (2021)

Figure 2.6 - ***Flood Hazards Near Proposed Site***



Source: GeoData@Wisconsin, FEMA Firm Panel, Sauk County (2018)

In terms of historic reliability at the site, the American Transmission Company (ATC) – a group that owns and operates the transmission system in WI – identified an opportunity to increase reliability and flexibility to customers in Prairie du Sac and Sauk City. Based on these findings, substation upgrades and an additional 69 kV radial line were put into service in December 2020 to increase redundancy. While the grid upgrades are helpful, the historic reliability constraints at this site presents an opportunity for future microgrid evaluations to further improve the critical services during an outage.

Technologies Under Consideration

The new police station facility includes plans to install solar PV. The proposed microgrid study for the EOC will consider solar PV, battery energy storage, and natural gas and diesel generation technologies, as well as microgrid controller technologies. Given the site's existing natural gas feed-in, including the consideration of natural gas will allow for scenarios of longer duration that are more cost effective. The site will be assessed for solar potential to see what, if any, additional solar PV can be installed on-site in addition to the existing plans. Battery energy storage will be assessed to smooth the solar generation and allow for charging to occur for resilience benefits and energy cost savings.

This microgrid study will evaluate different technologies to provide resilience benefits at the site, including but not limited to solar PV, battery energy storage, natural gas and diesel generation, and microgrid capabilities.

Cost Match

The grant request is for a total of $50,000, with a cost share of $34,500 bringing the project total to $84,500. The cost share includes in-kind labor contributions by the local distribution utility,

microgrid end-use customer, the wholesale electricity supplier, and the site architect. This also includes in-kind scope contributions by SEPA for industry outreach. The applicant requests the award amount of $50,000 to fund the tasks necessary to complete a microgrid feasibility study. The project team labor contribution will allow for the necessary project coordination to develop a comprehensive microgrid feasibility study that includes stakeholder engagement, data collection, system sizing analysis, and financial and environmental impact analysis. Funding for a microgrid feasibility study is essential in determining whether the Commission, Village of Prairie du Sac Utilities, and/or MSA are willing to move forward with a retrofit of the current construction on-going at the new police station.

Table 2.3 - ***Summary of Project Costs***

PSC Grant Request ($):	Applicant Cost Share ($):	Project Total ($):
$50,000	$34,500	$84,500

Source: Smart Electric Power Alliance, 2021

Table 2.4 - ***Cost Share Breakdown***

Project Team	Cost Share	Explanation
Sauk Prairie Police Commission (applicant)	50 hours of in-kind labor ($5,000 value)	Participating in regular stakeholder meetings, supporting data collection and site assessment
Village of Prairie du Sac Electric Utility	75 hours of in-kind labor ($7,500 value)	Participating in regular stakeholder meetings, supporting data collection and site assessment, preliminary engineering analysis
SEPA	$12,000	Lead stakeholder engagement, data collection, system sizing analysis, financial and environmental impact analysis, industry outreach
WPPI	50 hours of in-kind labor ($5,000 value)	Participating in regular stakeholder meetings, supporting data collection and site assessment

MSA Professional Services	50 hours of in-kind labor ($5,000 value)	Supporting site assessment, preliminary engineering analysis, coordination with current construction MEP plans

Source: Smart Electric Power Alliance, 2021

Data Collection Plan

The project team will convene regular stakeholder meetings to collect data and input relevant to the microgrid study. The Commission and MSA have already shared energy demand and consumption data with the project team that will be utilized to complete the study. The Commission and MSA also have access to all mechanical, engineering, and plumbing drawings for the site and will be able to provide them to the project team to support the microgrid study (see various site plans and maps included as reference). SEPA will utilize GIS capabilities to collect and analyze data from EIA, DHS, and FEMA to conduct analysis on the site's vulnerabilities and criticality to serve a public good during an outage event.

Additional data collection efforts are included in the sections below on system sizing analysis and financial analysis.

Systems Sizing Analysis

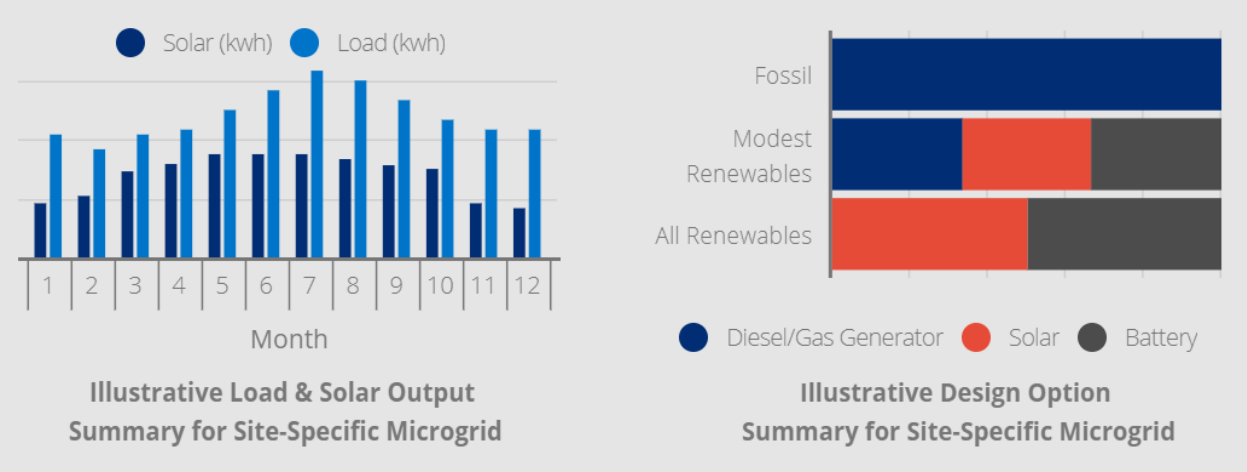
The EOC is intended to provide critical services to be included in a microgrid study but not limited to: emergency call response and dispatch, radio communication from EOC to officers and emergency responders, television monitoring, GPS mapping capabilities, facility lighting, heating and HVAC equipment, security cameras, and freezers and refrigerators in the evidence room. The Commission is also installing electric vehicle charging stations in the new police garage and public parking lot and is currently researching the purchase of hybrid and/or electric vehicles for future use in our fleet. The microgrid design scenario modeling will include system sizing analysis of different microgrid packages, which will look at different load serving, generating technologies, storage, fossil fuel back-up, grid services, and islanding capabilities to determine the cost-effectiveness of different scenarios.

As part of the current construction, MSA conducted an Energy Design Assistance report (included as a reference). The estimated demand for the site is 46.4kW with an annual electrical usage of 350,905kWh.

Careful consideration is needed when sizing microgrids as every situation offers unique challenges. Host load factor and shape along with cost concerns and environmental issues can lead to a broad range of microgrid sizes and costs. Setting these goals upfront will help tailor the microgrid as desired. Alternatively multiple scenarios can be studied that will help guide the decision process.

The preliminary engineering analysis will include siting considerations such as utility interconnection and microgrid operating modes during normal and emergency operation. During emergency operation, the microgrid will be evaluated to serve critical functions at the EOC.

Figure 2.7 - ***Annual Overview of Load and Solar Output & Summary of Design Options***



Source: Smart Electric Power Alliance, 2021

As part of the stakeholder meetings, the project team will work with key stakeholders to identify the critical loads and desired resilience needs of the EOC. Then, the project team will work to appropriately size the microgrid to provide both grid and customer services in both grid-connected and islanded modes. Data gathered for this microgrid study will help the Commission estimate cost and design options for a potential microgrid for the EOC.

Financial Analysis

The project team will conduct financial analysis that builds on the technical analysis, and focuses on developing a high-level inventory of potential costs and benefits for the microgrid project to assess the net benefit. When making investments in microgrid projects, it is important to evaluate the costs of the projects compared with the expected benefits. The goal of the financial analysis conducted in this study will be to quantify utility and societal benefits in economic terms, and determine how these economic benefits compare to the costs of implementing, operating, and maintaining the project over its lifespan. In order to do so, the local electric distribution utility will provide the necessary inputs for the project team to calculate potential ancillary service values, value of reliability and resiliency, wholesale benefits, and energy savings. These inputs part of the data collection plan may include inputs on frequency support and black start, reliability statistics on SAIDI, SAIFI and CAIDI, applicable customer energy and demand rates, available demand response programs, and energy usage data.

The new police station will likely be served under the GS-1 (General Service) tariff. The customer charge for a single-phase customer is $8.00 per month and $17.00 per month for a three-phase customer. The energy charge is $0.1117 per kilowatt-hour (kWh). It is worth mentioning that the

new police station is very close to the threshold for being served as a CP-1 (Small Power) customer, which would yield a customer charge of $50.00 per month, distribution demand charge of $1.50 per kW of distribution demand, demand charge of $8.00 per kW of billed demand, energy charge of $0.0713 per kilowatt-hour (kWh) and energy limiter of $0.1340 per kWh.

During normal grid-connected operation, this microgrid project may fall under Village of Prairie du Sac Electric Utilities' Emergency Response Program – where WPPI can request that members run any available municipal generation to support grid stability.

The benefits and costs will be quantified economically, and the multi-year cash flow will be translated into a Net Present Value (NPV). A benefit/cost ratio will be computed based on the NPV of all benefits divided by the NPV of all costs. A summary of potential costs and benefits are as follows:

- **Costs**: Generation (PV / NG), Battery Energy Storage System and Replacement, Microgrid Controller and Communications, Distribution Upgrades, Operations and Maintenance
- **Benefits**: Solar Generation, Congestion Relief, Avoided Capacity Costs, Avoided Transmission Costs, Avoided REC Compliance Costs, Emissions Reductions, Value of Resiliency, Energy Savings, Peak Load Support

Financing options that will be explored as part of the study may include a combination of investments made by the Commission, Village of Prairie du Sac Utilities, WPPI, along with leveraging funding sources from FEMA and other government agencies to construct and install the microgrid.

Environmental Impact

The Commission would like to reduce our overall impact on the environment and sees this feasibility study as a way to reduce greenhouse gas emissions and consumption of fossil fuels. The Commission is committed to using as much renewable energy as possible and has a desire to evaluate energy conservation and greenhouse gas emission reduction as part of a microgrid study. The microgrid would incorporate solar PV to offset electric usage from the grid, as well electric vehicle charging stations to reduce environmental impact of electricity usage and transportation. The project team will calculate greenhouse gas emissions reductions associated with the project and the reductions will be utilized to compute the societal benefits from the emissions reductions.

3.0 Reference Materials List

- MSA's Energy Design Assistance (attached separately)
- Sauk Prairie Police Proposed Electrical Drawings (attached separately)
- Sauk Prairie Police Station Proposed Solar Annual Production Report (attached separately)

- Sauk Prairie Police Station Certified Survey Map (attached separately)
- Village of Prairie du Sac Energy Management Policy (attached separately)
- Village of Prairie du Sac Utilities Letter of Support (attached separately)
- WPPI Letter of Support (attached separately)
- Statewide Parcel Map Initiative Parcel Data (included in Narrative)
- GeoData@Wisconsin Aerial Mosaic of Sauk County (included in Narrative)
- University of Wisconsin-Madison Neighborhood Atlas Map (included Narrative)
- Environmental Protection Agency EJSCREEN Tool (included Narrative)
- The National Risk Index from FEMA (included Narrative)
- GeoData@Wisconsin FEMA Firm Panel of Sauk County (included Narrative)

ENERGY DESIGN ASSISTANCE

BUNDLE REQUIREMENTS DOCUMENT

Sauk Prairie Police Station

Prairie du Sac, WI

November 11, 2020
4020444

Prepared by

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Partnering with Wisconsin utilities

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VILLAGE OF PRAIRIE DU SAC

Prairie du Sac Utilities

and

Alliant Energy

Alliant Energy

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Summary

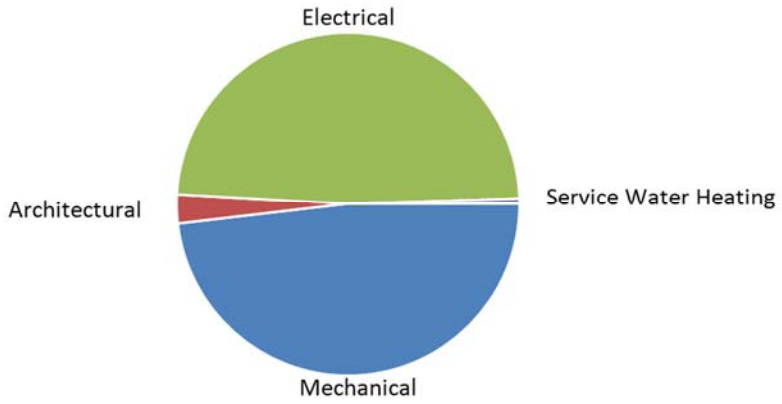
This document details the selected energy conservation strategies, an approximate timeline for verification, and the submittal information that we will need to complete the process.

The estimated Focus on Energy incentive offer is **$9,393.40** for the implementation of the energy conservation measures, including the HVAC A system, that comprise your energy efficiency bundle. To receive the full incentive, all strategies must be verified as functionally installed.

List of Selected Strategies

The following pages include a summary list of the selected strategies. Please review this list, taking note of the requested submittals. Also, please confirm the project timing and inform us if any of these strategies are no longer planned for implementation.

The graph shows the distribution of annual energy cost savings among the major building systems.



Space Asset Area	Strategy Description	Portion of Total $ Savings Modeled
VAV	Office: VAV with gas boiler hot water heating and air-cooled chiller chilled water cooling; Mezz/Garage - Emergency Vehicle: MAU with Gas Furnace heating and no cooling	23%
	Mechanical	
MAU	CO sensor control of ventilation	19%
MAU	Direct-fired furnace	7%
Facility	20% improved chiller efficiency	3%
Facility	95% efficient gas boiler with moderate temperature reset	2%
Facility	VFD on building chilled water pump	< 1%
Facility	VFD on building heating water pump	< 1%
Facility	VFD on chiller compressor	5%
	Architectural	
Office	Glazing high solar gain, metal frame	< 1%
Mezz/Garage - Emergency Vehicle	Roof R 30	< 1%

Space Asset Area	Strategy Description	Portion of Total $ Savings Modeled
Office	Roof R 30	< 1%
Mezz/Garage - Emergency Vehicle	Wall R 24	< 1%
Office	Wall R 24	< 1%
	Electrical	
Facility	Exterior tradable site lighting reduced to 0.92 kW	6%
Mezz/Garage - Emergency Vehicle	Occupancy sensor controls, 75% of space	9%
Mezz/Garage - Emergency Vehicle	Lighting power in Mezz/Garage - Emergency Vehicle reduced to 0.45 W/ft²	9%
Office	Lighting power in Office reduced to 0.66 W/ft²	13%
	Service Water Heating	
Facility	95% SWH efficiency	< 1%
Total Savings		**100%**

Selected Strategies and Requirements

Mechanical Strategies

Mechanical

<table>
<tr><th>Space Asset Area</th><th>Strategy Description</th><th>Design Requirements</th></tr>
<tr><td>Facility</td><td>VFD on building heating water pump</td><td>Install VFD control rather than constant speed drives on the loop pump motors. This strategy assumes two-way valves on applicable hydronic system coils to reduce flow rate (modeled to minimum 30% flow) during periods of low load.</td></tr>
<tr><td>Facility</td><td>VFD on building chilled water pump</td><td>Install VFD control rather than constant speed drives on the loop pump motors. This strategy assumes two-way valves on applicable hydronic system coils to reduce flow rate (modeled to minimum 30% flow) during periods of low load.</td></tr>
<tr><td>Facility</td><td>20% improved chiller efficiency</td><td>Improve cooling efficiency to values shown in the table below:
<table>
<tr><th>Size (tons)</th><th>Type</th><th>kW/ton</th></tr>
<tr><td>0 - 150</td><td>All</td><td>0.99</td></tr>
<tr><td>150 - 10000</td><td>All</td><td>0.99</td></tr>
</table></td></tr>
<tr><td>Facility</td><td>VFD on chiller compressor</td><td>Install a chiller with a variable frequency drive on the compressor that improves the part load performance (IPLV).</td></tr>
<tr><td>Facility</td><td>95% efficient gas boiler with moderate temperature reset</td><td>Install a condensing gas boiler with 95% peak efficiency and specify a moderate temperature reset schedule with return water temperatures ranging from 160°F (71.1°C) at peak winter conditions to 130°F (54.4°C) at mild conditions.</td></tr>
</table>

Garage

Space Asset Area	Strategy Description	Design Requirements
MAU	CO sensor control of ventilation beyond code	Provide carbon monoxide sensors that control the garage ventilation rates so that ventilation is reduced during times of low noxious gas concentrations.
MAU	Direct-fired furnace	Provide direct fired gas furnaces. Direct fired furnaces vent their exhaust air directly into the space.

Architectural Strategies

Wall

Space Asset Area	Strategy Description	Design Requirements
Office	Wall R 24	Install a wall with a total R-value, including thermal bridging of R-24 (U-0.042).
Mezz/Garage - Emergency Vehicle	Wall R 24	Install a wall with a total R-value, including thermal bridging of R-24 (U-0.042).

Roof

Space Asset Area	Strategy Description	Design Requirements
Office	Roof R 30	Install a roof with a total assembly value, including thermal bridging of R-30 (U-0.033).
Mezz/Garage - Emergency Vehicle	Roof R 30	Install a roof with a total assembly value, including thermal bridging of R-30 (U-0.033).

Glazing

Space Asset Area	Strategy Description	Design Requirements
Office	Glazing high solar gain, metal frame	Unit U-factor: 0.42 Center of glass U-factor: 0.29 Solar heat gain coefficient (SHGC): 0.38 Visible transmittance (VT): 0.7

Electrical Strategies

Lighting Controls

Space Asset Area	Strategy Description	Design Requirements
Mezz/Garage - Emergency Vehicle	Occupancy sensor controls, 75% of space	Provide occupancy sensors in 75% of the applicable spaces throughout the Space Asset Area.

Lighting Power Density

Space Asset Area	Strategy Description	Design Requirements
Facility	Exterior tradable site lighting reduced to 0.92 kW	Reduce tradable exterior site lighting power by 70% below the Baseline allowance.
Office	Lighting power in Office reduced to 0.66 W/ft²	Reduce lighting power density by 20% below the Baseline specified by Space Asset Area allowances.
Mezz/Garage - Emergency Vehicle	Lighting power in Mezz/Garage - Emergency Vehicle reduced to 0.45 W/ft²	Reduce lighting power density by 20% below the Baseline specified by Space Asset Area allowances.

Other Strategies

Service Water Heating

Space Asset Area	Strategy Description	Design Requirements
Facility	95% SWH efficiency	Install an 95% efficient natural gas service hot water heater.

Required Submittals

Two months prior to construction completion, please forward the following items in electronic format:

- Construction Documents and Specifications
- COMcheck™ (if used to demonstrate compliance with the state energy code)
- Construction submittals

Architectural

- Construction submittal indicating typical exterior wall assembly R-value
- Construction submittal indicating roof assembly R-value
- Construction submittals showing glazing characteristics, including C.O.G. U-value, unit U-value, solar heat gain coefficient, and visible transmittance

Electrical

- The most current lighting plans with the accepted fixture schedule (if different from the Construction Documents)
- Lamp submittals showing the lamp type and input wattage
- Lighting control submittals

Mechanical

- All heating and cooling equipment submittals
- HVAC controls submittal
- Pump motor cut sheets showing operating bhp and gpm

Please submit these materials to newconstruction@focusonenergy.com as compressed files via email using a commonly available compression technology. The program can receive email as large as 20 megabytes. If your documents exceed this size, please send them in multiple emails.

Verification

This Bundle Requirements Document is the first stage of the verification process and seeks to assure that the design intent bundle is implemented.

The process includes the following:

- Project team notifies Focus on Energy of the bundle selection – **Done.**
- Focus on Energy sends a Bundle Requirements Document to the project team, tailored to the selected bundle strategies – **This report.**
- Project team sends Construction Documents to Focus on Energy, electronic format preferred, two months before construction completion.
- Project team sends State of Wisconsin approved COMcheck submittal to Focus on Energy, two months before construction completion.
- Project team sends requested equipment submittals to Focus on Energy, two months before construction completion.
- Field verification of select projects of installed strategies once the building is completed and occupied*.
- Report by Focus on Energy as to status of strategy implementation.
- Focus on Energy provides incentive payment.

If some of the chosen strategies are not implemented within the selected bundle, Focus on Energy may choose to adjust the incentive amount.

The following details the verification plan for the different strategy categories.

Architectural

1. Review Construction Documents for selected energy efficiency measures
2. Review construction submittals for selected energy efficiency measures

Electrical

1. Review Construction Documents for selected controls, fixtures, lamps, ballasts
2. Review construction submittals for selected controls, fixtures, lamps, ballasts
3. After construction completion, visually inspect installed controls, fixtures, lamps, and ballasts*
4. After construction completion, functionally test the installed controls, verify response to changes and sensitivity*

Mechanical

1. Review Construction Documents for selected energy efficiency measures
2. Review construction submittals for selected energy efficiency measures
3. After construction completion, visually inspect installed energy efficiency measures*

**Note that 10% of the Energy Design Assistance projects will be selected for on-site verification. The owner will be notified by Focus on Energy if the project has been selected upon construction completion. For projects not selected for on-site verification, the Construction Documents, State of Wisconsin approved COMcheck submission, and the equipment submittals will be used to verify the installed strategies.*

Selected Bundle Results and Incentive

The Energy Design Assistance promotes the implementation of cost-effective bundles of strategies by proposing cash incentives to reduce the added cost of implementing the selected energy conserving strategies.

The incentive offers listed on the following pages make the presumption that the selected bundle will be implemented in its entirety. Any changes from the specifications of the selected bundle should be reported to Focus on Energy. If it is deemed that these changes would have a significant impact on energy, then Focus on Energy will make adjustments to the incentives accordingly. The incentive offers are estimates until approved by the Program Administrator. An Incentive Agreement will be provided to the owner detailing the approved incentive amount.

*** Please note that at this time the incentive is an estimate. The incentive will be confirmed upon verification and any subsequent strategy modifications.**

The simple payback analysis shows that the Focus on Energy incentive has helped reduce the incremental costs associated with the energy conservation strategy investments in this building, resulting in a payback of **12.3** years.

Energy Parameter	Baseline	Bundle 2
Building Results		
Energy Cost	$44,883	$31,363
Energy Cost Savings		$13,520
Percent Energy Cost Savings		30%
Electric Demand (kW)	46.4 kW	32.5 kW
Electric Demand Savings		13.9 kW
Percent Electric Demand Savings		30%
Electric Consumption	350,905 kWh	246,711 kWh
Electric Consumption Savings		104,194 kWh
Percent Electric Consumption Savings		30%
Gas Consumption	10,521 Therm	7,063 Therm
Gas Consumption Savings		3,459 Therm
Percent Gas Consumption Savings		33%
Total Results		
Total Incremental First Cost		$175,850
Total MMBtu's saved		701
Estimated Total Incentive		**$9,393.40**
Simple Payback with Incentive		**12.3**

** The figures in Bundle 2 are reprinted from the September 23, 2020 Results Meeting Minutes for this project, which were the basis for the original energy savings projections.*

Energy Parameter	Baseline	Bundle 2
Building Results		
Energy Use Intensity (EUI)	83.3 KBtu/ft²/yr	57.3 KBtu/ft²/yr
EUI Savings		26.0 KBtu/ft²/yr
Percent EUI Savings		31%

***Note**: Subject to the following qualifications, the computer model offers sophisticated predictions of energy savings with estimations as good as any other means available for a building that has not been built.*

The strategy and bundle results compare relative differences in net energy use for design alternatives. The results are not appropriate for system design and/or equipment selection; these are responsibilities of the registered design professionals of record.

The actual energy use of this building will be different from simulated results. Building systems and other operating parameters provided by the design team and modeled by Focus on Energy approximate actual conditions, but differences in weather, operating parameters, occupancy level, and changes that occur through the bidding and construction process will result in annual energy costs that will be different from what is predicted here. However, when a bundle of strategies is selected relative to other alternatives, its energy (and dollar) conserving value can be expected to remain constant relative to the other alternatives, and the magnitude of the cost should be approximately as predicted.

Thus, implementation of a bundle of strategies offers the opportunity for energy savings, but the realization of those savings is the responsibility of the owner/operator of the building – not Focus on Energy. Savings are not guaranteed.

Appendix A. Project Information

Building Summary		
Location	Prairie du Sac, WI	
Narrative	1 story new construction police department with emergency vehicle garage	
Space Asset Areas	Area	Number of Stories
Office	14,300 ft²	1
Mezz/Garage - Emergency Vehicle	12,700 ft²	1
Total	**27,000 ft²**	**1**
Exterior lighting	23,000 sf	
Utilities		
Electric Utility	Prairie du Sac Utilities	
Gas Utility	Alliant Energy	
Schedule		
Construction Documents Complete	02/15/2021	
Construction Start	04/15/2021	
Occupancy	05/01/2022	
Baseline Reference	ASHRAE 90.1-2013 Appendix G	
Other Notes		

Systems Summary	
Selected HVAC	Offices: VAV with air-cooled chiller and gas boiler hot water heat/reheat Garage: Gas fired MAU

Contact Information	
Enrollment Number	FOE-64F23-18125
Submitted by	Erikka Byrge on June 22, 2020
Contact Name	Carter Arndt
Email	carndt@msa-ps.com
Phone	608.355.8884

Appendix B. Isolated Selected Strategy Results

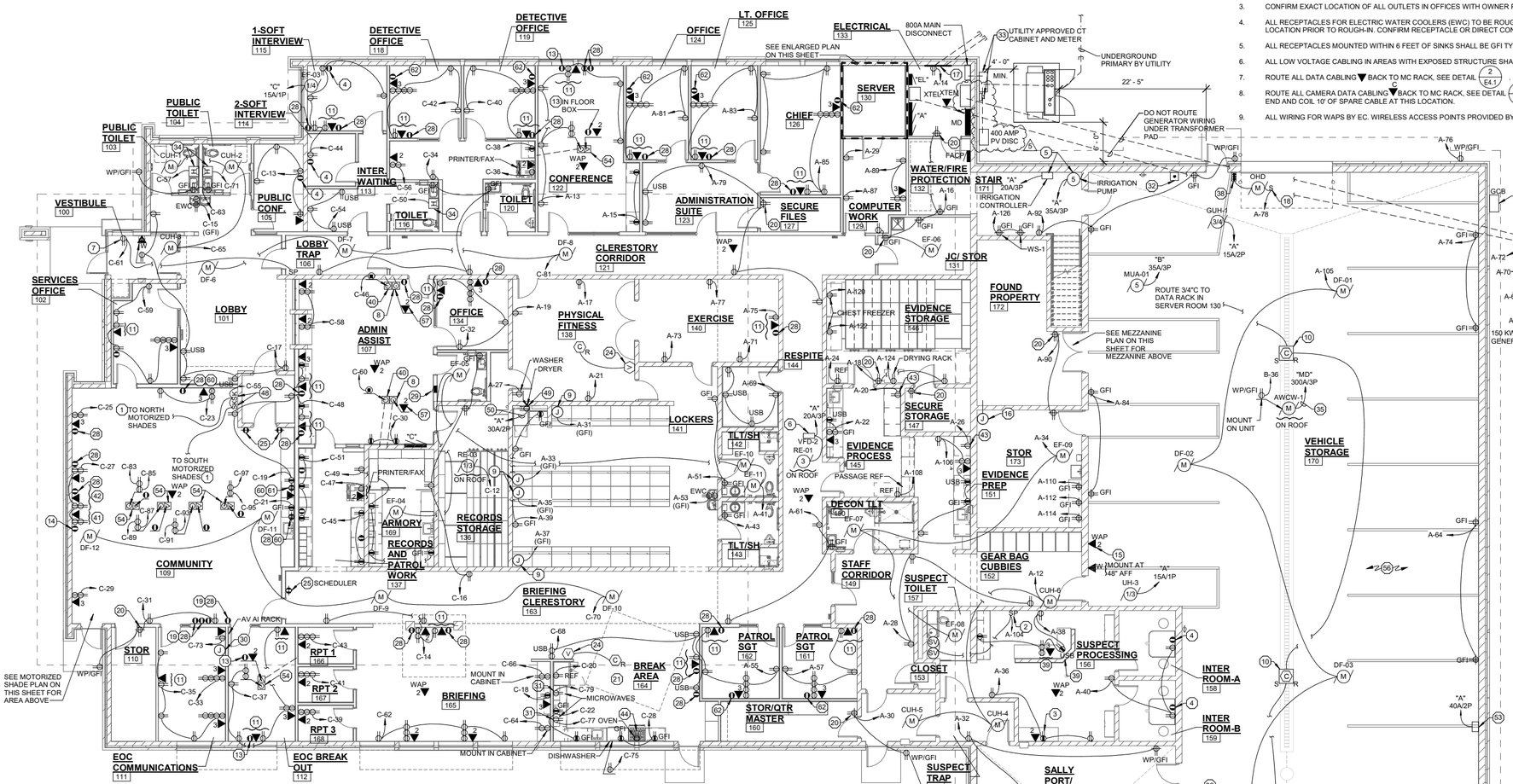
The savings indicated is based on the performance of the individual strategy relative to the proposed HVAC system illustrating the impact of each strategy alone. The reported savings does not account for the interaction between multiple strategies, and as a result, the summation of the individual savings *may* not equal the total anticipated savings. The savings shown for the proposed HVAC system is in comparison to the baseline mechanical system.

Space Asset Area	Strategy Description	Peak kW Savings	kWh Savings	Gas Savings (Therm)	Energy Cost Savings	Inc. Cost
VAV	Office: VAV with gas boiler hot water heating and air-cooled chiller chilled water cooling; Mezz/Garage - Emergency Vehicle: Packaged Single Zone with Gas Furnace heating and no cooling	4.6	39,923	-1,913	$3,268	$124,407
Facility	VFD on building heating water pump	0	243	-6	$23	$167
Facility	VFD on building chilled water pump	0.1	498	0	$57	$167
Facility	20% improved chiller efficiency	1.9	4,280	0	$471	$10,431
Facility	VFD on chiller compressor	3	6,885	0	$759	$2,266
Facility	95% efficient gas boiler with moderate temperature reset	0	88	426	$261	$2,168
MAU	CO sensor control of ventilation	0	5,175	3,477	$2,627	$0
MAU	Direct-fired furnace	0	0	1,795	$1,059	$0
Office	Wall R 24	0.1	133	141	$99	$2,229
Office	Roof R 30	0.3	441	45	$75	$12,883
Office	Glazing high solar gain, metal frame	0.2	553	-67	$23	$150

Space Asset Area	Strategy Description	Peak kW Savings	kWh Savings	Gas Savings (Therm)	Energy Cost Savings	Inc. Cost
Mezz/Garage - Emergency Vehicle	Wall R 24	0	0	71	$43	$3,253
Mezz/Garage - Emergency Vehicle	Roof R 30	0	0	102	$61	$11,441
Facility	Exterior tradable site lighting reduced to 0.92 kW	0	8,182	0	$902	$1,450
Office	Lighting power in Office reduced to 0.66 W/ft²	2	16,701	7	$1,848	$763
Mezz/Garage - Emergency Vehicle	Occupancy sensor controls, 75% of space	1.3	11,682	-86	$1,239	$2,374
Mezz/Garage - Emergency Vehicle	Lighting power in Mezz/Garage - Emergency Vehicle reduced to 0.45 W/ft²	1.4	12,460	-92	$1,318	$678
Facility	95% SWH efficiency	0	0	92	$55	$1,024

Appendix C. Project Participants

Name	Company	Email	Phone
Carter Arndt	MSA Professional Services Inc. - Baraboo	carndt@msa-ps.com	608.355.8884
Reggie Schwarzenbart	MSA Professional Services Inc. - Baraboo	rschwarzenbart@msa-ps.com	920.894.7800
Ken Sorenson	MSA Professional Services Inc. - Baraboo	ksorensen@msa-ps.com	920.544.9404
Ben Nerat	Muermann Engineering	ben@msa-ps.com	920.243.4033
Dave Schulze	Muermann Engineering	dschulze@msa-ps.com	920.894.4710
Jerry Strunz	Sauk Prairie Police Department	jerrys@saukprairiepd.com	608.643.2427
Erikka Byrge	Slipstream (formerly Seventhwave)	ebyrge@slipstreaminc.org	608.210.7161
Zach Kramer	Focus on Energy	zkramer@willdan.com	952.939.1802
Lara Bakker	Focus on Energy	lara.rosol@focusonenergy.com	608.709.5172

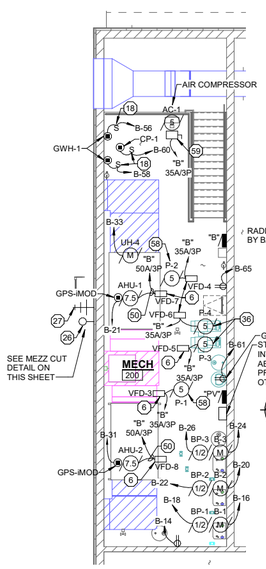


GENERAL NOTES:

1. PROVIDE EXTERIOR RECEPTACLES PER DETAIL 7/E4.0
2. ALL CONDUITS STUBBED OUT OF BUILDING SHALL BE DONE PER DETAIL 1/E4.0
3. CONFIRM EXACT LOCATION OF ALL OUTLETS IN OFFICES WITH OWNER PRIOR TO ROUGH-IN.
4. ALL RECEPTACLES FOR ELECTRIC WATER COOLERS (EWC) TO BE ROUGHED-IN BEHIND UNIT. CONFIRM EXACT LOCATION PRIOR TO ROUGH-IN. CONFIRM RECEPTACLE OR DIRECT CONNECTION.
5. ALL RECEPTACLES MOUNTED WITHIN 6 FEET OF SINKS SHALL BE GFI TYPE.
6. ALL LOW VOLTAGE CABLING IN AREAS WITH EXPOSED STRUCTURE SHALL BE IN CONDUIT.
7. ROUTE ALL DATA CABLING ▼ BACK TO MC RACK, SEE DETAIL 2/E4.1
8. ROUTE ALL CAMERA DATA CABLING ▼ BACK TO MC RACK, SEE DETAIL 2/E4.1 . PROVIDE PIGTAIL ON CAMERA END AND COIL 10' OF SPARE CABLE AT THIS LOCATION.
9. ALL WIRING FOR WAPS BY EC. WIRELESS ACCESS POINTS PROVIDED BY OWNER, INSTALLED BY EC.

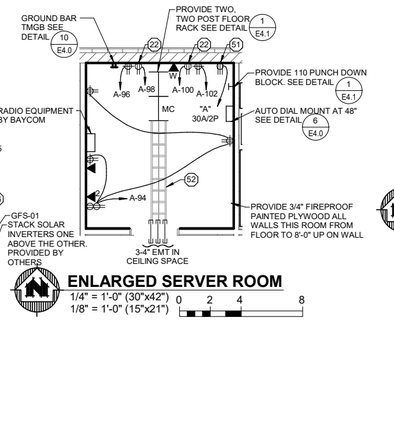
PLAN NOTES: (X)

1. SEE COMMUNITY ROOM MOTORIZED SHADE PLAN ON THIS SHEET.
2. PLUMBING SOLENOID VALVE SWITCH (PILOT HANDLE). CONNECT TO SOLENOID VALVE, CONNECT TO CIRCUIT A-104 PROVIDE ENGRAVED LABEL "WATER".
3. RECEPTACLE FOR INTOXIMETER.
4. PROVIDE BLANK BOX FOR MICROPHONE THAT IS SUPPLIED BY BAYCOM AND WIRED BY EC. WIRE BRICK TO HEAD END IN SERVER 130. WIRE USING SHIELDED 2C, 22 AWG PLENUM RATED. FINAL TERMINATION BY BAYCOM.
5. PROVIDE CONNECTION UNDER ALTERNATE BID 6.
6. VFD PROVIDED BY HVAC CONTRACTOR AND INSTALLED BY EC. SEE HVAC PLANS FOR EXACT LOCATION OF VFD.
7. MOUNT AT 10'-6" AFF TO CENTER FOR ABOVE VESTIBULE.
8. E.C. TO PROVIDE TYPE 1 FLOOR BOX. VERIFY LOCATION PRIOR TO ROUGH-IN. USE 1"C FOR DATA. ROUTE UNDER FLOOR, UP WALL INTO CEILING SPACE. EC TO FISH DATA WIRING THROUGH TOE SPACE OF OFFICE PARTITION. PROVIDE MINI-COM TYPE DATA PLATE. PROVIDE CONNECTION TO OFFICE PARITION PER DETAIL 9/E4.1
9. JUNCTION BOX FOR LOCKER CONNECTION, EC TO COORDINATE LOCKER CONNECTION WITH LOCKER SUPPLIER PRIOR TO ROUGH-IN.
10. SURFACE SPEAKER BACKBOX PROVIDED BY BAYCOM AND INSTALLED BY EC. EC TO PROVIDE 3/4"C BETWEEN SPEAKERS AS SHOWN. SPEAKER WILL BE FURNISHED AND INSTALLED BY BAYCOM. EC TO PROVIDE PLENUM RATED SPEAKER WIRING BETWEEN SPEAKERS AND FROM FIRST SPEAKER TO RADIO EQUIPMENT HEADEND IN SERVER ROOM 130.
11. MOUNT AT 66" AFF FLOOR TO BOTTOM.
12. MOUNT AT 9'-0" AFF.
13. PROVIDE 1 GANG BOX AND 1" CONDUIT STUBBED TO CEILING SPACE FOR AUDIO VISUAL EQUIPMENT.
14. PROVIDE 2 GANG BOX AND 1-1/4" CONDUIT STUBBED TO CEILING SPACE FOR AUDIO VISUAL EQUIPMENT.
15. MOUNT AT 10'-0" AFF TO BOTTOM.
16. PROVIDE J-BOX FOR ANTENNA WIRING AND ROUTE IN A 2" CONDUIT TO DATA RACK IN SERVER 130.
17. PROVIDE FIBER, TELEPHONE, AND CATV SERVICE ENTRANCE PER DETAIL 11/E4.0
18. EC TO PROVIDE TOGGLE DISCONNECT SWITCH.
19. MOUNT AS HIGH AS POSSIBLE FOR AUDIO VISUAL EQUIPMENT.
20. LOCATE WITH ROOM LIGHT SWITCH.
21. WIRE USING 3#10, #10 GND IN 3/4"C.
22. LOCATE OUTLET ON WALL AT 7'-0" AFF TO BOTTOM.
23. PROVIDE PORTABLE GENERATOR CONNECTION BOX PER DETAIL 9/E4.0
24. PROVIDE 1 GANG BOX AND 3/4" CONDUIT STUBBED INTO CEILING SPACE FOR VOLUME CONTROL. VOLUME CONTROL, SPEAKER WILL BE FURNISHED AND INSTALLED BY BAYCOM. EC TO PROVIDE PLENUM RATED SPEAKER WIRING FROM SPEAKER TO VOLUME CONTROL AND VOLUME CONTROL TO RADIO EQUIPMENT HEADEND IN SERVER ROOM 130.
25. PROVIDE 2 GANG BOX AND 3/4" CONDUIT STUBBED TO CEILING SPACE FOR AUDIO VISUAL EQUIPMENT. MOUNT AT 44" AFF TO TOP.
26. PROVIDE 2" WEATHERHEAD LOCATE AT THE ROOF PEAK UNDER THE OVERHANG. ROUTE 2"C BACK INTO THE RADIO EQUIPMENT HEADEND IN SERVER ROOM 130. PROVIDE PULL CORD IN THIS CONDUIT, ANNTENA CABLING SUPPLIED BY BAYCOM AND INSTALLED IN RACEWAY BY EC. BAYCOM TO TERMINATE.
27. RADIO ANTENNA BY OTHERS. ANTENNA WIRING BY EC. PROVIDE RG870 COAX (PLENUM RATED) 50 OR 60 OHMS PROVIDE MALE BARREL CONNECTORS ON ENDS COIL 10' OF SPARE COAX IN CORRIDOR CEILING SPACE.
28. PROVIDE 1 GANG BOX AND 3/4" CONDUIT STUBBED TO CEILING SPACE FOR AUDIO VISUAL EQUIPMENT.
29. PROVIDE FLUSH MOUNTED GENERATOR ANNUNCIATOR PANEL MOUNT AT 48" AFF TO TOP. LOCATE IN OFFICE.
30. PROVIDE A FLUSH J-BOX FOR AV SYSTEM WIRING PER DETAIL 5/E4.1
31. MOUNT IN OVERSHELF, SEE ARCHITECTURAL ELEVATIONS FOR LOCATION.
32. EMERGENCY STOP FOR GENERATOR. MOUNT AT 48" AFF TO TOP. PROVIDE ENGRAVED LABEL
33. MOUNT METER AND CT IN BACK UP WALL SO FROM METER TO CT CABINET IS FLUSH IN WALL. ALSO ALL CONDUITS FOR SECONDARY (BOTTOM OF CT) SHALL BE POURED IN FOUNDATION WALL.
34. PROVIDE CONNECTION FOR FLUSH MOUNT HAND DRYER. MOUNT AT 37" AFF TO BOTTOM. SEE ARCHITECTURAL DRAWINGS FOR LOCATION. HAND DRYER BY GC.
35. WIRE USING (3) 300 KCMIL (CU), #4 (CU) GND IN 2-1/2"C.
36. NOTE ONLY ONE PUMP (P-3 OR P-4) WILL RUN AT A TIME.
37. PROVIDE A DUPLEX RECEPTACLE MOUNTED FACE DOWN IN SOFFIT (FOR FUTURE GUTTER HEAT TAPE) PROVIDE WEATHERPROOF FLIP UP COVERS FOR THIS RECEPTACLE WIRE THROUGH CONTACTOR STATE PER PLAN NOTE 36 CONNECT TO GFI BREAKER.
38. UP/STOP/DN SWITCH PROVIDED WITH OHD E.C. TO INSTALL.
39. FLUSH MOUNT DEVICES IN CABINET FEED UNDER FLOOR UP TO WALL INTO CEILING SPACE.
40. E.C. TO PROVIDE TYPE 1 FLOOR BOX. VERIFY LOCATION PRIOR TO ROUGH-IN. USE 3/4"C FOR POWER AND (2) 1 1/4"C FOR LOW VOLTAGE CABLING. ROUTE UNDER FLOOR, UP WALL INTO CEILING SPACE. PROVIDE CONNECTION TO OFFICE PARITION PER DETAIL 9/E4.1
41. MOUNT AT 5'-4" AFF FLOOR TO BOTTOM. COORDINATE WITH FEARING DRAWINGS PRIOR TO ROUGH-IN.
42. MOUNT AT 7'-8" AFF FLOOR TO BOTTOM. COORDINATE WITH FEARING DRAWINGS PRIOR TO ROUGH-IN.
43. RECEPTACLE FOR LATITDE FENTANYL FILTERED HOOD PROVIDED BY OWNER.
44. PROVIDE 4-PIN 50 AMP RANGE OUTLET. MOUNT AT 1" ABOVE FLOOR. CIRCUIT TO A 50A/2P BREAKER IN PANEL "C". WIRE USING 3#6, #10 GND IN 3/4"C.
45. PROVIDE FLUSH MOUNTED CONNECTION ON MOTORIZED SHADE. VERIFY LOCATION WITH SHADE SUPPLIER.
46. MOUNT AT 18'-0" AFF TO TOP . VERIFY WITH ARCHITECT ELEVATION.
47. MOUNT AT 20'-10" AFF TO TOP . VERIFY WITH ARCHITECT ELEVATION.
48. UP/STOP/DN SWITCH FOR MOTORIZED SHADES, SUPPLIED BY SHADE SUPPLIER INSTALLED BY EC.
49. PROVIDE A 4-PIN OUTLET TO MATCH OWNER'S EQUIPMENT.
50. WIRE USING 3#10, AND #10 GND IN 1/2"C.
51. PROVIDE 4-PIN OUTLET. VERIFY PLUG TYPE WITH OWNER'S EQUIPMENT. WIRE USING 3#10, #10 GND IN 1/2"C.
52. PROVIDE LADDER TRAY ABOVE. EXTEND INTO CORRIDOR ABOVE LAY-IN CEILING. BOLT LADDER TRAY TO RACK. PROVIDE ADDITIONAL CABLE TRAY AS REQUIRED TO ACCOMMODATE CABLE PLUS 50% SPARE CAPACITY, SEE DETAIL 3/E4.1
53. VECHILE CHARGING STATION PROVIDED BY OWNER AND INSTALLED BY EC PER DETAIL 3/E1.0 . PROVIDE CONCRETE BASE FOR VECHILE CHARGING STATION. IF OWNER DECIDES NOT TO PURCHASE AT THIS TIME, EC TO PULL ALL WIRING TO THE EV STATION, WIRE NUT ENDS, PROVIDE A JUNCTION BOX TO CAP THE CONDUIT, AND TURN OFF BREAKER.
54. E.C. TO PROVIDE TYPE 5 FLOOR BOX. VERIFY LOCATION PRIOR TO ROUGH-IN. USE 3/4"C FOR POWER AND 1-1/4"C FOR BLANK BOX. ROUTE UNDER FLOOR, UP WALL INTO CEILING SPACE.
55. PROVIDE A PILOT HANDLED SWITCH.
56. IN GARAGE AREA KEEP ALL ELECTRICAL ITEMS ABOVE 18" AFF TO STAY CLEAR OF CLASS 1 DIV II AREA.
57. EC TO FISH DATA WIRING THROUGH TOE SPACE OF OFFICE PARTITION. PROVIDE MINI-COM DATA PLATE.
58. ONLY ONE PUMP (P1 OR P2) WILL RUN AT A TIME.
59. EC TO PROVIDE DISCONNECT.
60. MOUNT AT 9'-4" AFF TO BOTTOM.
61. PROVIDE 2 GANG BOX AND 3/4" CONDUIT STUBBED TO CEILING SPACE FOR AUDIO VISUAL EQUIPMENT.
62. PROVIDE 2 GANG BOX AND 3/4" CONDUIT STUBBED TO CEILING SPACE FOR AUDIO VISUAL EQUIPMENT. PROVIDE 2 GANG PLATER RING.



MEZZANINE PLAN - POWER

1/8" = 1'-0" (30"x42")
1/16" = 1'-0" (15"x21")
0 4 8 16



ENLARGED SERVER ROOM

1/4" = 1'-0" (30"x42")
1/8" = 1'-0" (15"x21")
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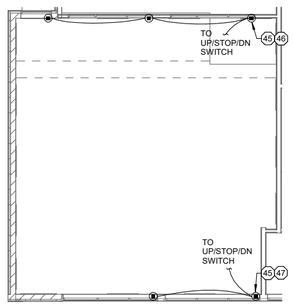
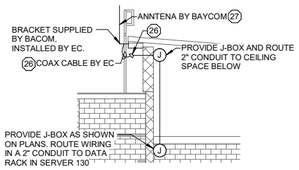


COMMUNITY ROOM MOTORIZED SHADES

1/8" = 1'-0" (30"x42")
1/16" = 1'-0" (15"x21")
0 2 4 8



MEZZ CUT DETAIL

1/8" = 1'-0" (30"x42")
1/16" = 1'-0" (15"x21")
0 2 4 8

PROJECT DATE: 02/10/2021	DRAWN BY: CTS	DESIGNED BY: RLS	CHECKED BY: DJS

No	DATE	REVISIONS	BY
4	04/02/2021	Proposal Request #1	
5	04/16/2021	Proposal Request #1 Revision	

PLOT DATE: 4/19/2021 12:49:13 PM , BIM 360://01621002 - Sauk Prairie Police Station/01621002 - Sauk Prairie Police Station_Elec_RVT 2020 Central.rvt

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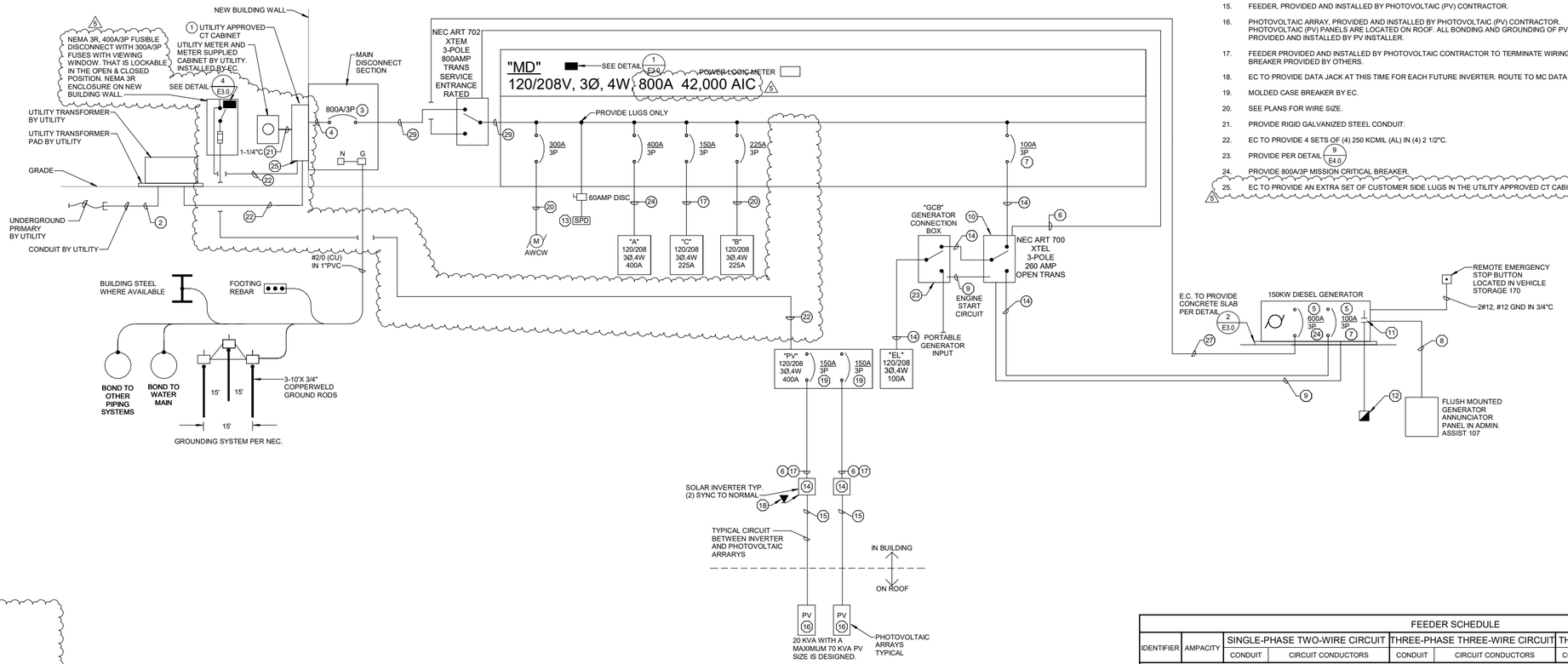
SAUK PRAIRIE POLICE STATION
SAUK PRAIRIE POLICE COMMISSION
PRAIRIE DU SAC, WISCONSIN

OVERALL FLOOR PLAN - POWER

PROJECT NO. 01621002
SHEET E1.2P

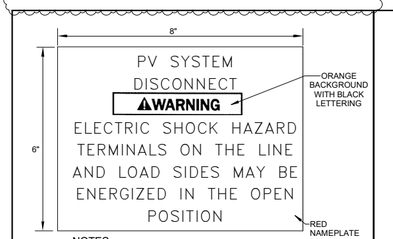


ONE LINE DIAGRAM
NTS

ONE-LINE PLAN NOTES: (X)

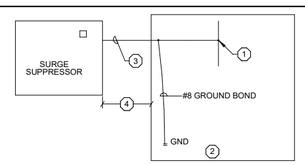
1. PROVIDE PER UTILITY REQUIREMENTS.
2. PROVIDE CONDUITS PER UTILITY REQUIREMENTS.
3. PROVIDE AS AN ENCLOSED CIRCUIT BREAKER.
4. WIRE USING 2 SETS OF (4) 250 KCMIL (AL) IN (2) 2-1/2"C.
5. BREAKER SHALL MATCH DISTRIBUTION EQUIPMENT FOR BETTER COORDINATION OF BREAKERS.
6. PROVIDE WIRING AS REQUIRED BETWEEN MASTER AND SLAVE TRANSFER SWITCHES.
7. PROVIDE MISSION CRITICAL 250 AMP FRAME SIZE BREAKER WITH ADJUSTABLE TRIP
8. PROVIDE BELDON 9041 AND 2#12 FOR LED POWER WITH #12 GND IN 1" C OR EQUAL
9. PROVIDE 2C#18 STRANDED AND 9841 COMMUNICATION CABLE IN 1"C.
10. GENERATOR TRANSFER SWITCH HAS BEEN UPSIZED DUE TO NEED AIC RATING.
11. PROVIDE AUX CONTACT FOR THIS BREAKER TO SEND ALARM TO THE FIRE ALARM PANEL WHEN THIS BREAKER IS IN THE OFF POSITION.
12. PROVIDE FIRE ALARM MONITOR MODULE THAT WILL SEND A TROUBLE SIGNAL WHEN BREAKER IS IN THE OFF POSITION. WIRE USING 2#12, #12 GND IN 3/4"C.
13. PROVIDE EXTERNAL SURGE PROTECTION. SEE DETAIL 3 E3.0
14. 20kW (55.5 AMPS) INVERTER, PROVIDED AND INSTALLED BY PHOTOVOLTAIC (PV) CONTRACTOR. ASSUMED LOAD OF 55.5A X 1.25 = 69.5. NEXT HIGHEST SIZE BREAKER (150A/3P) IS SHOWN.
15. FEEDER, PROVIDED AND INSTALLED BY PHOTOVOLTAIC (PV) CONTRACTOR.
16. PHOTOVOLTAIC ARRAY, PROVIDED AND INSTALLED BY PHOTOVOLTAIC (PV) CONTRACTOR. PHOTOVOLTAIC (PV) PANELS ARE LOCATED ON ROOF. ALL BONDING AND GROUNDING OF PV PANELS PROVIDED AND INSTALLED BY PV INSTALLER.
17. FEEDER PROVIDED AND INSTALLED BY PHOTOVOLTAIC CONTRACTOR TO TERMINATE WIRING ON FUTURE BREAKER PROVIDED BY OTHERS.
18. EC TO PROVIDE DATA JACK AT THIS TIME FOR EACH FUTURE INVERTER. ROUTE TO MC DATA CLOSET.
19. MOLDED CASE BREAKER BY EC.
20. SEE PLANS FOR WIRE SIZE.
21. PROVIDE RIGID GALVANIZED STEEL CONDUIT.
22. EC TO PROVIDE 4 SETS OF (4) 250 KCMIL (AL) IN (4) 2 1/2"C.
23. PROVIDE PER DETAIL 9 E4.0
24. PROVIDE 800A/3P MISSION CRITICAL BREAKER.
25. EC TO PROVIDE AN EXTRA SET OF CUSTOMER SIDE LUGS IN THE UTILITY APPROVED CT CABINET. (5)

(5)



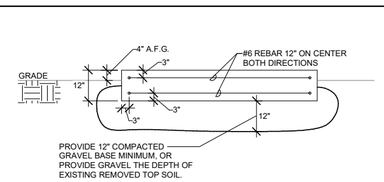
NOTES:
1. INSTALL ON PV DISCONNECT
2. SIGNAGE WILL BE PER ANSI Z535.4-2011
3. ALL LETTERING MUST BE 3/8" HIGH

4 E3.0 PV DISCONNECT NAMEPLATE DETAIL
SCALE: NTS



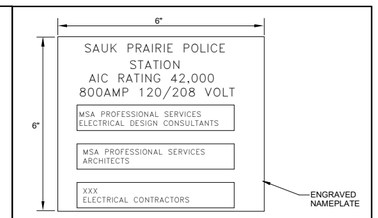
KEY NOTES: (X)
1. PROVIDE LUGS IN SWITCHBOARD.
2. MAIN SERVICE PANEL OR DISTRIBUTION PANEL, SEE DRAWINGS.
3. 4#6 & #6 GND. IN 1 1/4" CONDUIT FOR 60 AMP MAIN SERVICE SUPPRESSION 4#10 & #8 GND. IN 1" CONDUIT FOR 30 AMP BUILDING INTERIOR PANEL SURGE SUPPRESSION.
4. CONDUIT AND FEEDER DISTANCE NOT TO EXCEED 5 FEET.

3 E3.0 EXTERNAL SURGE PROTECTION DETAIL
SCALE: NTS



GENERAL NOTES:
1. COORDINATE QUANTITY AND LOCATION OF CONDUIT STUBS WITH MANUFACTURER.
2. VERIFY EXACT LENGTH AND WIDTH WITH SET MANUFACTURER. PROVIDE PAD 6" LARGER THAN SET EACH SIDE.

2 E3.0 GENERATOR PAD CONCRETE BASE DETAIL
SCALE: NTS



NOTES:
1. INSTALL ON MAIN SERVICE PANEL

1 E3.0 "MD" NAMEPLATE DETAIL
SCALE: NTS

FEEDER SCHEDULE

IDENTIFIER	AMPACITY	SINGLE-PHASE TWO-WIRE CIRCUIT		THREE-PHASE THREE-WIRE CIRCUIT		THREE-PHASE FOUR-WIRE CIRCUIT		EQUIPMENT GROUNDING CONDUCTOR
		CONDUIT	CIRCUIT CONDUCTORS	CONDUIT	CIRCUIT CONDUCTORS	CONDUIT	CIRCUIT CONDUCTORS	
COPPER CONDUCTORS								
1	10	3/4"	(2) #12	3/4"	(3) #12	3/4"	(4) #12	#12
2	15	3/4"	(2) #12	3/4"	(3) #12	3/4"	(4) #12	#12
3	20	3/4"	(2) #12	3/4"	(3) #12	3/4"	(4) #12	#12
4	25	3/4"	(2) #10	3/4"	(3) #10	3/4"	(4) #10	#10
5	30	3/4"	(2) #10	3/4"	(3) #10	3/4"	(4) #10	#10
6	35	3/4"	(2) #8	3/4"	(3) #8	3/4"	(4) #8	#10
7	40	3/4"	(2) #8	3/4"	(3) #8	3/4"	(4) #8	#10
8	45	3/4"	(2) #8	3/4"	(3) #8	3/4"	(4) #8	#10
9	50	3/4"	(2) #8	3/4"	(3) #8	3/4"	(4) #8	#10
10	60	3/4"	(2) #6	3/4"	(3) #6	1"	(4) #6	#10
11	70	1"	(2) #4	1"	(3) #4	1-1/4"	(4) #4	#8
12	80	1"	(2) #4	1"	(3) #4	1-1/4"	(4) #4	#8
13	90	1"	(2) #3	1"	(3) #3	1-1/4"	(4) #3	#8
14	100	1-1/4"	(2) #3	1-1/4"	(3) #3	1-1/4"	(4) #3	#8
ALUMINUM CONDUCTORS								
15	110	1-1/4"	(2) #1/0	1"	(3) #1/0	2"	(4) #1/0	#4
16	125	1-1/2"	(2) #2/0	2"	(3) #2/0	2"	(4) #2/0	#4
17	150	1-1/2"	(2) #3/0	2"	(3) #3/0	2"	(4) #3/0	#4
18	175	N/A	N/A	2"	(3) #4/0	2-1/2"	(4) #4/0	#4
19	200	N/A	N/A	2-1/2"	(3) 250KCMIL	2-1/2"	(4) 250KCMIL	#4
20	225	N/A	N/A	2-1/2"	(3) 300KCMIL	2-1/2"	(4) 300KCMIL	#2
21	250	N/A	N/A	2-1/2"	(3) 350KCMIL	3"	(4) 350KCMIL	#2
22	300	N/A	N/A	3"	(3) 500 KCMIL	3"	(4) 500KCMIL	#2
23	350	N/A	N/A	(2) 2"	2 SETS OF (3) #4/0	(2) 2-1/2"	2 SETS OF (4) #4/0	#1
24	400	N/A	N/A	(2) 2-1/2"	2 SETS OF (3) 250KCMIL	(2) 2-1/2"	2 SETS OF (4) 250KCMIL	#1
25	450	N/A	N/A	(2) 2-1/2"	2 SETS OF (3) 300KCMIL	(2) 2-1/2"	2 SETS OF (4) 300KCMIL	#1/0
26	500	N/A	N/A	(2) 2-1/2"	2 SETS OF (3) 350KCMIL	(2) 3"	2 SETS OF (4) 350KCMIL	#1/0
27	600	N/A	N/A	(2) 3"	2 SETS OF (3) 500KCMIL	(2) 3 1/2"	2 SETS OF (4) 500KCMIL	#2/0
28	700	N/A	N/A	(3) 2-1/2"	3 SETS OF (3) 350KCMIL	(3) 3"	3 SETS OF (4) 350KCMIL	#3/0
29	800	N/A	N/A	(4) 2-1/2"	4 SETS OF (3) 250KCMIL	(4) 2-1/2"	4 SETS OF (4) 250KCMIL	#3/0
30	900	N/A	N/A	(4) 2-1/2"	4 SETS OF (3) 300KCMIL	(4) 2-1/2"	4 SETS OF (4) 300KCMIL	#4/0
31	1000	N/A	N/A	(4) 2-1/2"	4 SETS OF (3) 350KCMIL	(4) 3"	4 SETS OF (4) 350KCMIL	#4/0
32	1200	N/A	N/A	(4) 3"	4 SETS OF (3) 500KCMIL	(4) 3-1/2"	4 SETS OF (4) 500KCMIL	250KCMIL
33	1600	N/A	N/A	(6) 2-1/2"	6 SETS OF (3) 400KCMIL	(6) 3"	6 SETS OF (4) 400KCMIL	350KCMIL
34	1800	N/A	N/A	(6) 3"	6 SETS OF (3) 500KCMIL	(6) 3-1/2"	6 SETS OF (4) 500KCMIL	400KCMIL
35	2000	N/A	N/A	(6) 3"	6 SETS OF (3) 600KCMIL	(6) 3-1/2"	6 SETS OF (4) 600KCMIL	400KCMIL
36	2500	N/A	N/A	(8) 3"	8 SETS OF (3) 600KCMIL	(8) 3-1/2"	8 SETS OF (4) 600KCMIL	600KCMIL
37	3000	N/A	N/A	(10) 3-1/2"	10 SETS OF (3) 500KCMIL	(10) 3-1/2"	10 SETS OF (4) 500KCMIL	600KCMIL
38	4000	N/A	N/A	(12) 3-1/2"	12 SETS OF (3) 600KCMIL	(12) 4"	12 SETS OF (4) 600KCMIL	800KCMIL

PLAN NOTATION:
- ◇ SINGLE-PHASE, TWO-WIRE FEEDER, NUMBER IS THE FEEDER IDENTIFIER
- □ THREE-PHASE, THREE-WIRE FEEDER, NUMBER IS THE FEEDER IDENTIFIER
- ○ THREE-PHASE, FOUR-WIRE FEEDER, NUMBER IS THE FEEDER IDENTIFIER

No	DATE	REVISIONS	BY
2	02/24/2021	ADDENDUM #2	
4	04/02/2021	Proposal Request #1	
5	04/16/2021	Proposal Request #1 Revision	

PROJECT DATE: 02/10/2021
DRAWN BY: CTS
DESIGNED BY: RLS
CHECKED BY: DJS

PLOT DATE: 4/19/2021 12:49:14 PM , BIM 360://01621002 - Sauk Prairie Police Station/01621002 - Sauk Prairie Police Station_Elec_RVT 2020 Central.rvt

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SAUK PRAIRIE POLICE STATION
SAUK PRAIRIE POLICE COMMISSION
PRAIRIE DU SAC, WISCONSIN

ONE-LINE DIAGRAM

PROJECT NO. 01621002
SHEET E3.0

PANEL I.D. MD

AMPS 800	MAIN CB AMPS: NONE	AIC 42,000	
PHASE 3	TYPE: DISTRIBUTION PANEL WITH INTERNAL POWER LOGIC METER	MOUNT: FLOOR	
WIRE 4	PROVIDE MINIMUM OF 18" SPARE SPACE		
VOLTAGE 120/208			

TYPE	CIRCUIT DESIGNATION	KVA Aϕ	KVA Bϕ	KVA Cϕ	BREAKER AMP	BREAKER POLE	CKT #	CKT #	BREAKER AMP	BREAKER POLE	KVA Aϕ	KVA Bϕ	KVA Cϕ	CIRCUIT DESIGNATION	TYPE
Panel	PANEL "A"	36.86			400	3	1	2	150	3	22.70			PANEL "C"	Panel
Panel			32.87				3	4				17.66			Panel
Panel				24.00			5	6					19.21		Panel
Panel	PANEL "B"	18.77			225	3	7	8	300	3	17.57			AWCW-1	M
Panel			18.77				9	10				17.57			M
Panel				17.09			11	12					17.57		M
	SPACE						13	14	100	3	1.12			PANEL "EL"	Panel
	SPACE						15	16				2.20			Panel
	SPACE						17	18					0.71		Panel
	SPACE						19	20						SPACE	
	SPACE						21	22						SPACE	
	SPACE						23	24						SPACE	
	SPACE						25	26						SPACE	
	SPACE						27	28						SPACE	
	SPACE						29	30						SPACE	
	SPACE						31	32						SPACE	
	SPACE						33	34						SPACE	
	SPACE						35	36						SPACE	
	SPACE						37	38						SPACE	
	SPACE						39	40						SPACE	
	SPACE						41	42						SPACE	

TOTAL LINE-NEUTRAL KVA	55.63	51.64	41.09	41.39	37.42	37.49

TOTAL CONNECTED KVA	264.66	TOTAL ESTIMATED KVA DEMAND:	210.77
TOTAL CONNECT AMPS	734.62	TOTAL ESTIMATED AMP DEMAND:	585.04

TOTALS BY TYPE:	THIS PANEL	TOTAL W/ SUB PANELS	ESTIMATED DEMAND BY TYPE	NOTES
R (RECEPTACLES)	0.00	112.98	61.49	
L (LIGHTING)	0.00	19.71	19.71	* GFI CIRCUIT
M (MOTORS)	52.70	129.57	129.57	
X	0.00	0.00	0.00	
A (AC)	0.00	0.00	0.00	
E (ELEC. HEAT)	0.00	0.00	0.00	NEC 220-56 TABLE 6 AND
K (KITCHEN EQUIPMENT)	0.00	0.00	0.00	OVER @ 0.65 DEMAND.

PANEL I.D. EL

AMPS 100	MAIN CB AMPS: NONE	AIC 14,000
PHASE 3	TYPE: 250VAC LIGHTING AND APPLIANCE PANEL	MOUNT: SURFACE
WIRE 4	PROVIDE INTERNAL SURGE SUPPRESSION	
VOLTAGE 120/208		

TYPE	CIRCUIT DESIGNATION	KVA Aϕ	KVA Bϕ	KVA Cϕ	BREAKER AMP	BREAKER POLE	CKT #	CKT #	BREAKER AMP	BREAKER POLE	KVA Aϕ	KVA Bϕ	KVA Cϕ	CIRCUIT DESIGNATION	TYPE
L	EXTERIOR LTG	0.30			20	1	1	2	20	1	0.10			NIGHT LTG	L
L	LTG		1.10		20	1	3	4	20	1		0.60		LTG	L
	SPARE			0.00	20	1	5	6	20	1			0.71	LTG	L
	SPARE	0.00			20	1	7	8	20	1	0.72			LTG	L
R	FACP		0.50		20	1	9	10						SPACE	
	SPACE						11	12						SPACE	
	SPACE						13	14						SPACE	
	SPACE						15	16						SPACE	
	SPACE						17	18						SPACE	
	SPACE						19	20						SPACE	
	SPACE						21	22						SPACE	
	SPACE						23	24						SPACE	
	SPACE						25	26						SPACE	
	SPACE						27	28						SPACE	
	SPACE						29	30						SPACE	

TOTAL LINE-NEUTRAL KVA	0.30	1.60	0.00	0.82	0.60	0.71

TOTAL CONNECTED KVA	4.03	TOTAL ESTIMATED KVA DEMAND:	4.03
TOTAL CONNECT AMPS	11.19	TOTAL ESTIMATED AMP DEMAND:	11.19

TOTALS BY TYPE:	THIS PANEL	TOTAL W/ SUB PANELS	ESTIMATED DEMAND BY TYPE	NOTES
R (RECEPTACLES)	0.50	0.50	0.50	
L (LIGHTING)	3.53	3.53	3.53	* GFI CIRCUIT
M (MOTORS)	0.00	0.00	0.00	
X	0.00	0.00	0.00	
A (AC)	0.00	0.00	0.00	
E (ELEC. HEAT)	0.00	0.00	0.00	NEC 220-56 TABLE 6 AND
K (KITCHEN EQUIPMENT)	0.00	0.00	0.00	OVER @ 0.65 DEMAND.

PANEL I.D. A

AMPS 400	MAIN CB AMPS: NONE	AIC 35,000
PHASE 3	TYPE: 250VAC LIGHTING AND APPLIANCE PANEL	MOUNT: SURFACE
WIRE 4	PROVIDE AS TWO 84 CKT TUBS	
VOLTAGE 120/208	WITH SUB FEED LUGS IN THE FIRST PANEL	

TYPE	CIRCUIT DESIGNATION	KVA Aϕ	KVA Bϕ	KVA Cϕ	BREAKER AMP	BREAKER POLE	CKT #	CKT #	BREAKER AMP	BREAKER POLE	KVA Aϕ	KVA Bϕ	KVA Cϕ	CIRCUIT DESIGNATION	TYPE
L	LTG	0.89			20	1	1	2	20	1	0.50			EXTERIOR LTG	L
L	LTG		1.10		20	1	3	4	20	1		1.16		LTG	L
L	LTG			1.18	20	1	5	6	20	1			1.14	LTG	L
L	LTG	1.16			20	1	7	8	20	1	0.20			EXIT LTG	L
L	LTG		1.10		20	1	9	10	20	1		0.18		REC	R
	SPARE			0.00	20	1	11	12	20	1			0.60	CUH-4,5,6	M
R	REC	1.80			20	1	13	14	20	1	0.18			REC	R
R	REC		0.36		20	1	15	16	20	1		0.72		REC	R
R	REC			0.18	20	1	17	18	20	1			0.54	REC	R
R	REC	0.36			20	1	19	20	20	1	0.18			REC	R
R	REC		0.18		20	1	21	22	20	1		0.54		REC	R
R	DRYER			2.50	30	2	23	24	20	1			0.18	REC	R
R		2.50					25	26	20	1	0.18			REC	R
R	WASHER		0.18		20	1	27	28	20	1		0.54		REC	R
R	REC			0.18	20	1	29	30	20	1			0.54	REC	R
R	LOCKER CONN	1.00			*20	1	31	32	20	1	0.36			REC	R
R	LOCKER CONN		1.00		*20	1	33	34	20	1		0.60		EF-07,08,09	M
R	LOCKER CONN			1.00	*20	1	35	36	20	1			0.54	REC	R
R	LOCKER CONN	1.00			*20	1	37	38	20	1	0.90			REC	R
R	REC		0.36		20	1	39	40	20	1		0.54		REC	R
M	EF-04,05,10,11			0.70	20	1	41	42	20	1			0.50	OHD	M
R	REC	0.18			20	1	43	44	20	1	0.70			RE-02	M
R	FM200		0.50		20	1	45	46	20	1		0.50		OHD	M
R	FM200			0.50	20	1	47	48	20	1			0.50	OHD	M
R	TS & FS	0.10			20	1	49	50	20	1	0.18			REC	R
R	REC		0.36		20	1	51	52	20	1		0.72		REC	R
R	REC			0.36	*20	1	53	54	15	1			0.18	EF-02	M
R	REC	1.08			20	1	55	56	15	3	0.94			EF-01 (VFD-1)	M
R	REC		1.08		20	1	57	58				0.94			M
R	S2 PANELS			0.50	20	1	59	60					0.94		M
R	REC	0.54			20	1	61	62	20	1	0.36			REC	R
M	RE-01 (VFD-2)		1.32		20	3	63	64	20	1		0.36		REC	R
M				1.32			65	66	20	1			0.50	HEATER	R
M		1.32					67	68	20	1	0.50			HEATER	R
R	REC		0.54		20	1	69	70	20	1		0.12		BATTERY	R
R	REC			0.18	20	1	71	72	20	1			0.12	LOUVER	R
R	REC	0.18			20	1	73	74	20	1	0.36			REC	R
R	REC		0.18		20	1	75	76	20	1		0.18		REC	R
R	REC			0.18	20	1	77	78	20	1			0.50	OHD	M
R	REC	0.72			20	1	79	80	40	2	3.30			EV CAR	R
R	REC		1.08		20	1	81	82				3.30		CHARGER	R
R	REC			1.08	20	1	83	84	20	1			0.36	REC	R
R	REC	1.62			20	1	85	86	40	2	3.30			EV CAR	R
R	REC		0.18		20	1	87	88				3.30		CHARGER	R
R	REC			0.54	20	1	89	90	20	1			0.36	REC	R
M	UH-1	0.20			15	1	91	92	20	1	0.72			REC	R
M	IRRIGATION		2.10		35	3	93	94	20	1		0.72		REC	R
M	PUMP			2.10			95	96	20	1			0.18	REC	R
M	5 HP	2.10					97	98	20	1	0.18			REC	R
R	IRRIGATION		0.50		20	3	99	100	20	1		0.18		REC	R
R	CONTROLLER			0.50			101	102	20	1			0.18	REC	R
R		0.50					103	104	20	1	0.18			SOLENOID	R
M	DF-1,2,3,4,5,5a		0.50		20	1	105	106	20	1		1,08		REC	R
	SPARE				20	1	107	108	20	1			0.18	REC	R
M	GUH-1	0.72			15	2	109	110	20	1	0.18			REC	R
M			0.72				111	112	20	1		0.18		REC	R
M	UH-2			0.82	15	1	113	114	20	1			0.18	REC	R
M	POWER WASHER	1.20			35	3	115	116	40	2	3.30			EV CAR	R
			1.20				117	118				3.30		CHARGER	R
				1.20			119	120	20	1			0.18	REC	R
M	UH-3	0.82			15	1	121	122	20	1	0.18			REC	R
L	EXT LIGHTING		0.08		20	2	123	124	20	1		0.18		REC	R
L				0.08			125	126	20	1			0.50	WS-1	R
	SPARE	0.00			20	1	127	128			0.00			SPACE	
	SPARE		0.00		20	1	129	130				0.00		SPACE	
	SPARE			0.00	20	1	131	132					0.00	SPACE	
	SPARE	0.00			20	1	133	134			0.00			SPACE	
	SPARE		0.00		20	1	135	136				0.00		SPACE	
	SPACE			0.00			137	138					0.00	SPACE	
	SPACE	0.00					139	140			0.00			SPACE	
	SPACE		0.00				141	142				0.00		SPACE	
	SPACE			0.00			143	144					0.00	SPACE	
	SPACE	0.00					145	146			0.00			SPACE	
	SPACE		0.00				147	148				0.00		SPACE	
	SPACE			0.00			149	150					0.00	SPACE	
	SPACE	0.00					151	152			0.00			SPACE	
	SPACE		0.00				153	154				0.00		SPACE	
	SPACE			0.00			155	156					0.00	SPACE	
	SPACE	0.00					157	158			0.00			SPACE	
	SPACE		0.00				159	160				0.00		SPACE	
	SPACE			0.00			161	162					0.00	SPACE	
	SPACE	0.00					163	164			0.00			SPACE	
	SPACE		0.00				165	166				0.00		SPACE	
	SPACE			0.00			167	168					0.00	SPACE	

TOTAL LINE-NEUTRAL KVA	19.99	14.62	15.10	16.88	18.25	8.90

TOTAL CONNECTED KVA	93.73	TOTAL ESTIMATED KVA DEMAND:	66.37
TOTAL CONNECT AMPS	260.18	TOTAL ESTIMATED AMP DEMAND:	184.23

TOTALS BY TYPE:	THIS PANEL	TOTAL W/ SUB PANELS	ESTIMATED DEMAND BY TYPE	NOTES
R (RECEPTACLES)	59.92	59.92	34.96	
L (LIGHTING)	8.59	8.59	8.59	* GFI CIRCUIT
M (MOTORS)	22.82	22.82	22.82	
X	0.00	0.00	0.00	
A (AC)	0.00	0.00	0.00	
E (ELEC. HEAT)	0.00	0.00	0.00	NEC 220-56 TABLE 6 AND
K (KITCHEN EQUIPMENT)	0.00	0.00	0.00	OVER @ 0.65 DEMAND.

PANEL I.D. B

AMPS 225	MAIN CB AMPS: NONE	AIC 18,000
PHASE 3	TYPE: 250VAC LIGHTING AND APPLIANCE PANEL	MOUNT: SURFACE
WIRE 4	PROVIDE SINGLE TUB	
VOLTAGE 120/208		

TYPE	CIRCUIT DESIGNATION	KVA Aϕ	KVA Bϕ	KVA Cϕ	BREAKER AMP	BREAKER POLE	CKT #	CKT #	BREAKER AMP	BREAKER POLE	KVA Aϕ	KVA Bϕ	KVA Cϕ	CIRCUIT DESIGNATION	TYPE
L	LTG	1.18			20	1	1	2	20	1	0.00			SPARE	
L	LTG		1.16		20	1	3	4	20	1		0.00		SPARE	
	SPACE						5	6	20	1			0.00	SPARE	
	SPACE						7	8						SPACE	
	SPACE						9	10						SPACE	
	SPACE						11	12						SPACE	
	SPACE						13	14	20	1	0.18			REC	R
M	AHU-2 (VFD-8)		3.03		50	3	15	16	20	1		0.70		B-1	M
M				3.03			17	18	20	1			1.18	BP-1	M
M		3.03					19	20	20	1	0.70			B-2	M
R	GPS-IMOD		0.18		20	1	21	22	20	1		1.18		BP-2	M
	SPACE						23	24	20	1			0.70	B-3	M
M	AHU-1 (VFD-7)	3.03			50	3	25	26	20	1	1.18			BP-3	M
M			3.03				27	28	20	1		0.00		SPARE	
M				3.03		1	29	30	35	3			2.10	MUA-1	M
R	GPS-IMOD	0.18			20	1	31	32			2.10			5 HP	M
M	UH-4		0.70		20	1	33	34				2.10			M
R	REC			0.18	20	1	35	36	20	1			0.18	REC	R
M	P-3	2.10			35	3	37	38	35	3	2.10			P-1	M
M	5 HP		2.10				39	40				2.10		5 HP	M
M				2.10			41	42					2.10		M
M	P-4				35	3	43	44	35	3				P-2	M
M	5 HP						45	46						5 HP	M
M	STAND-BY						47	48						STAND-BY	M
	SPACE						49	50						SPACE	
	SPACE						51	52						SPACE	
	SPACE						53	54						SPACE	
M	AC-1	2.10			35	3	55	56	20	1	0.20			MOTOR	M
M	5 HP		2.10				57	58	20	1		0.20		GWH-1	M
M				2.10			59	60	20	1			0.20	CP-1	M
M	GFS-01	0.50			20	1	61	62	20	1	0.18			REC	R
R	REC		0.18		20	1	63	64	20	1				SPARE	
R	REC			0.18	20	1	65	66	20	1				SPARE	
	SPACE						67	68	20	1				SPARE	
	SPACE						69	70	20	1				SPARE	
	SPACE						71	72						SPACE	
	SPACE						73	74						SPACE	
	SPACE						75	76						SPACE	
	SPACE						77	78						SPACE	
	SPACE						79	80						SPACE	
	SPACE						81	82						SPACE	
	SPACE						83	84						SPACE	

TOTAL LINE-NEUTRAL KVA	12.13	12.49	10.63	6.64	6.28	6.46

TOTAL CONNECTED KVA	54.63	TOTAL ESTIMATED KVA DEMAND:	54.63
TOTAL CONNECT AMPS	151.63	TOTAL ESTIMATED AMP DEMAND:	151.63

TOTALS BY TYPE:	THIS PANEL	TOTAL W/ SUB PANELS	ESTIMATED DEMAND BY TYPE	NOTES
R (RECEPTACLES)	1.44	1.44	1.44	
L (LIGHTING)	2.34	2.34	2.34	* GFI CIRCUIT
M (MOTORS)	50.85	50.85	50.85	
X	0.00	0.00	0.00	
A (AC)	0.00	0.00	0.00	
E (ELEC. HEAT)	0.00	0.00	0.00	NEC 220-56 TABLE 6 AND
K (KITCHEN EQUIPMENT)	0.00	0.00	0.00	OVER @ 0.65 DEMAND.

PANEL I.D. PV

AMPS 400	MAIN CB AMPS: NONE	AIC 18,000
PHASE 3	TYPE: I-LINE PANEL	MOUNT: SURFACE
WIRE 4	PROVIDE 6" OF SPARE SPACE	
VOLTAGE 120/208		

TYPE	CIRCUIT DESIGNATION	KVA Aϕ	KVA Bϕ	KVA Cϕ	BREAKER AMP	BREAKER POLE	CKT #	CKT #	BREAKER AMP	BREAKER POLE	KVA Aϕ	KVA Bϕ	KVA Cϕ	CIRCUIT DESIGNATION	TYPE
X	PV	17.99			150	3	1	2	150	3	17.99			PV	X
X	SOLAR PANEL		17.99				3	4				17.99		SOLAR PANEL	X
X				17.99			5	6					17.99		X
	SPACE						7	8	60	3	0.00			TVSS	X
	SPACE						9	10				0.00			X
	SPACE						11	12					0.00		X
	SPACE						13	14						SPACE	
	SPACE						15	16						SPACE	
	SPACE						17	18						SPACE	
	SPACE						19	20						SPACE	

TOTAL LINE-NEUTRAL KVA	17.99	17.99	17.99	17.99	17.99	17.99

TOTAL CONNECTED KVA	107.94	TOTAL ESTIMATED KVA DEMAND:	107.94
TOTAL CONNECT AMPS	299.61	TOTAL ESTIMATED AMP DEMAND:	299.61

TOTALS BY TYPE:	THIS PANEL	TOTAL W/ SUB PANELS	ESTIMATED DEMAND BY TYPE	NOTES
R (RECEPTACLES)	0.00	0.00	0.00	
L (LIGHTING)	0.00	0.00	0.00	* GFI CIRCUIT
M (MOTORS)	0.00	0.00	0.00	
X	107.94	107.94	107.94	
A (AC)	0.00	0.00	0.00	
E (ELEC. HEAT)	0.00	0.00	0.00	NEC 220-56 TABLE 6 AND
K (KITCHEN EQUIPMENT)	0.00	0.00	0.00	OVER @ 0.65 DEMAND.

PANEL I.D. C

AMPS 225	MAIN CB AMPS: NONE	AIC 10,000
PHASE 3	TYPE: 250VAC LIGHTING AND APPLIANCE	MOUNT: FLUSH
WIRE 4	PANEL PROVIDE AS TWO 60 CKT TUBS	
VOLTAGE 120/208	PROIVDE FEED THRU LUGS IN FIRST TUB	

TYPE	CIRCUIT DESIGNATION	KVA Aϕ	KVA Bϕ	KVA Cϕ	BREAKER AMP	BREAKER POLE	CKT #	CKT #	BREAKER AMP	BREAKER POLE	KVA Aϕ	KVA Bϕ	KVA Cϕ	CIRCUIT DESIGNATION	TYPE
L	LTG	1.00			20	1	1	2	20	1	1.10			LTG	L
L	LTG		1.09		20	1	3	4	20	2		0.43		EXT POLE LTG	L
L	EXT BOLLARD LTG			0.70	20	1	5	6					0.43		L
L	EXT UP LTG	0.50			20	1	7	8						SPACE	
	SPACE						9	10	20	1		0.30		HANDICAP OP	R
	SPACE						11	12	20	1			0.80	RE-03	M
R	REC	0.72			20	1	13	14	20	1	0.18			REC	R
R	REC		0.36		*20	1	15	16	20	1		0.72		REC	R
R	REC			1.08	20	1	17	18	20	1			0.18	REC	R
R	REC	0.54			20	1	19	20	20	1	0.18			REC	R
R	REC		0.18		20	1	21	22	20	1		0.36		REC	R
R	REC			1.26	20	1	23	24	50	2			4.20	OVEN	R
R	REC	0.54			20	1	25	26			4.20				R
R	REC		0.54		20	1	27	28	20	1		0.36		REC	R
R	REC			0.54	20	1	29	30	20	1			0.36	REC	R
R	REC	0.72			20	1	31	32	20	1	1.08			REC	R
R	REC		0.36		20	1	33	34	20	1		0.90		REC	R
R	REC			0.90	20	1	35	36	20	1			0.18	REC	R
R	REC	1.08			20	1	37	38	20	1	0.18			REC	R
R	REC		0.54		20	1	39	40	20	1		1.26		REC	R
R	REC			0.54	20	1	41	42	20	1			1.26	REC	R
R	REC	0.54			20	1	43	44	20	1	1.08			REC	R
R	REC		0.90		20	1	45	46	20	1		0.50		REC	R
R	REC			0.18	20	1	47	48	20	1			0.36	REC	R
R	REC	0.54			20	1	49	50	20	1	0.30			HAND DRYER	R
R	REC		1.08		20	1	51	52	15	1		0.50		EF-03	M
M	EF-05			0.70	20	1	53	54	20	1			0.54	REC	R
R	MOTORIZED SHADE	0.50			20	1	55	56	20	1	0.36			REC	R
R	HAND DRYER		0.30		20	1	57	58	20	1		0.72		REC	R
R	REC			1.62	20	1	59	60	20	1			0.50	REC	R
R	REC	0.18			20	1	61	62	20	1	1.26			REC	R
R	REC		0.54		20	1	63	64	20	1		0.36		REC	R
M	CUH-1,2,3			0.50	20	1	65	66	20	1			0.36	REC	R
R	EV CAR	3.30			40	2	67	68	20	1	0.90			REC	R
R	CHARGER		3.30				69	70	20	1		0.50		DF-9,10,11,12	M
R	HAND DRYER			0.30	20	1	71	72	20	3			0.50	EXT GATE	R
R	AV SYSTEM	0.18			20	1	73	74			0.50			ALTERNATE	R
R	DISHWASHER		0.50		20	1	75	76				0.50		BID 1	R
R	MICROWAVE			0.50	20	1	77	78	20	1			0.18	ET DOOR	R
R	MICROWAVE	0.50			20	1	79	80	20	1	0.00			SPARE	
M	DF7 & 8		0.20		20	1	81	82	20	1		0.00		SPARE	
R	REC			0.18	20	1	83	84	20	1			0.00	SPARE	
R	REC	0.18			20	1	85	86						SPACE	
R	REC		0.18		20	1	87	88						SPACE	
R	REC			0.18	20	1	89	90						SPACE	
R	REC	0.18			20	1	91	92						SPACE	
R	REC		0.18		20	1	93	94						SPACE	
R	REC			0.18	20	1	95	96						SPACE	
R	REC	0.18			20	1	97	98						SPACE	
	SPACE						99	100						SPACE	
	SPACE						101	102						SPACE	
	SPACE						103	104						SPACE	
	SPACE						105	106						SPACE	
	SPACE						107	108						SPACE	
	SPACE						109	110						SPACE	
	SPACE						111	112						SPACE	
	SPACE						113	114						SPACE	
	SPACE						115	116						SPACE	
	SPACE						117	118						SPACE	
	SPACE						119	120						SPACE	

TOTAL LINE-NEUTRAL KVA	11.38	10.25	9.36	11.32	7.41	9.85

TOTAL CONNECTED KVA	59.57	TOTAL ESTIMATED KVA DEMAND:	39.01
TOTAL CONNECT AMPS	165.34	TOTAL ESTIMATED AMP DEMAND:	108.28

TOTALS BY TYPE:	THIS PANEL	TOTAL W/ SUB PANELS	ESTIMATED DEMAND BY TYPE	NOTES
R (RECEPTACLES)	51.12	51.12	30.56	
L (LIGHTING)	5.25	5.25	5.25	* GFI CIRCUIT
M (MOTORS)	3.20	3.20	3.20	
X	0.00	0.00	0.00	
A (AC)	0.00	0.00	0.00	
E (ELEC. HEAT)	0.00	0.00	0.00	NEC 220-56 TABLE 6 AND
K (KITCHEN EQUIPMENT)	0.00	0.00	0.00	OVER @ 0.65 DEMAND.

PROJECT DATE: 02/10/2021	DRAWN BY: CTS	No 4	04/02/2021	Proposal Request #1	
	DESIGNED BY: RLS	No 5	04/16/2021	Proposal Request #1 Revision	
	CHECKED BY: DJS				

PLOT DATE: 4/16/2021 12:49:17 PM , BIM 360://01621002 - Sauk Prairie Police Station/01621002 - Sauk Prairie Police Station_Elec_RVT 2020 Central.rvt

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SAUK PRAIRIE POLICE STATION
SAUK PRAIRIE POLICE COMMISSION
PRAIRIE DU SAC, WISCONSIN

PANEL SCHEDULES

PROJECT NO. 01621002
SHEET E3.1

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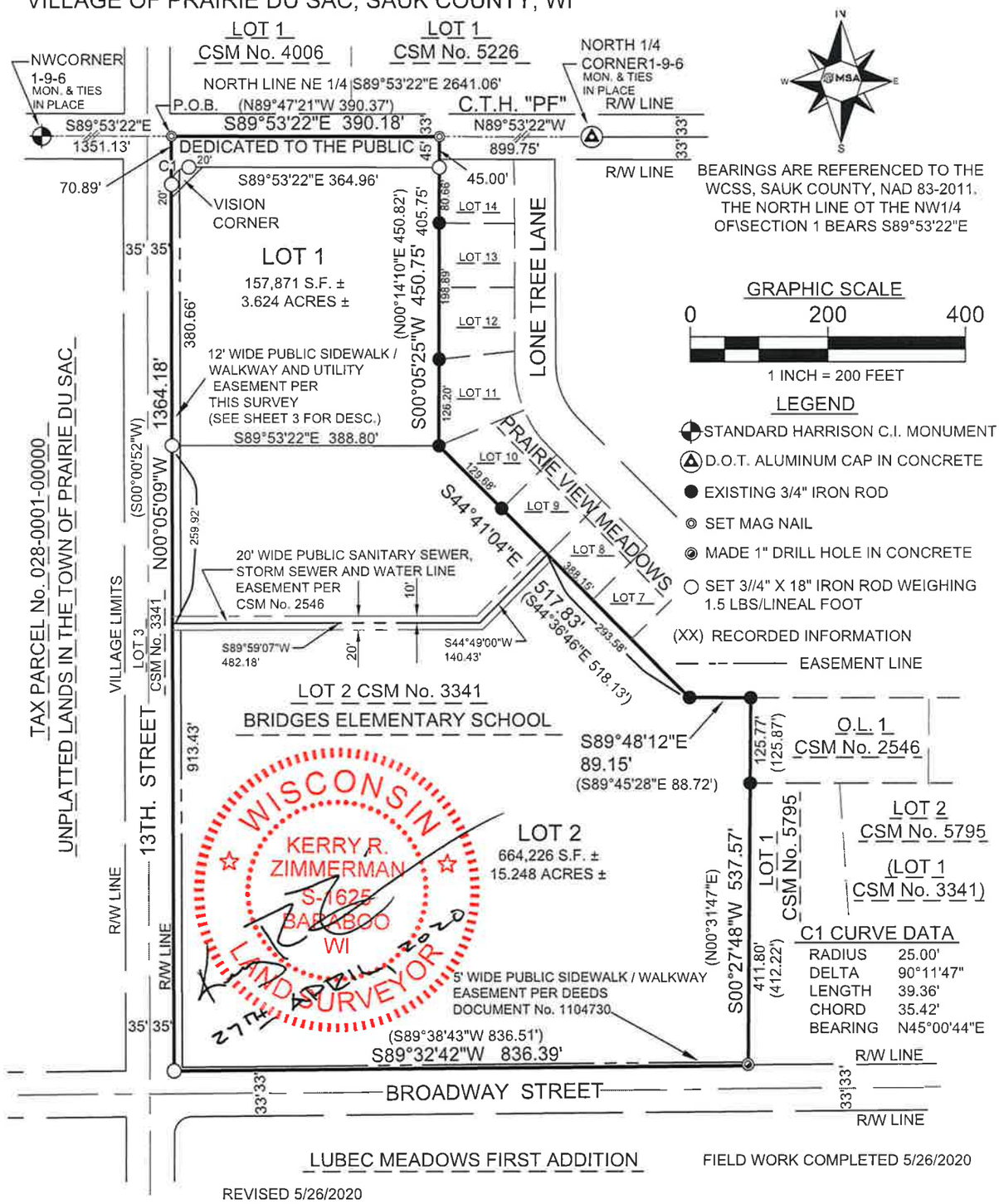
PROJECT NO.	1621001
DRAWN BY:	KRZ
SURVEYOR:	KRZ
FILE NO.	1621001
SHEET NO.	1 OF 3

OWNER:
SAUK PRAIRIE SCHOOL DISTRICT
213 MAPLE STREET
SAUK CITY, WI 53583
(608) 643-5990

SAUK COUNTY CERTIFIED SURVEY MAP #

LOT 2 OF SAUK COUNTY CERTIFIED SURVEY MAP No.3341 LOCATED IN THE NE1/4 OF THE NE1/4 OF SECTION 1, TOWN 9 NORTH, RANGE 6 EAST, VILLAGE OF PRAIRIE DU SAC, SAUK COUNTY, WI



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PROJECT NO.	1621001
DRAWN BY:	KRZ
CHECKED BY:	BK
FILE:	1621001
SHEET NO.	2 of 3

SAUK COUNTY CERTIFIED SURVEY MAP

LOCATED IN LOT 2 OF SAUK COUNTY CERTIFIED SURVEY MAP No. 3341, BEING PART OF THE NORTHEAST 1/4 OF THE NORTHWEST 1/4 OF SECTION 1, TOWN 9 NORTH, RANGE 6 EAST, VILLAGE OF PRAIRIE DU SAC, SAUK COUNTY, WISCONSIN.

SURVEYOR'S CERTIFICATE

I, Kerry R. Zimmerman, Professional Land Surveyor, do hereby certify that by the order of the **Sauk Prairie School District,** I have surveyed, divided and mapped a part of Lot 2 of Sauk County Certified Survey Map No. 3341, being part of the Northeast 1/4 of the Northwest 1/4 of Section 1, Town 9 North, Range 6 East, Village of Prairie Du Sac, Sauk County, Wisconsin, described as follows:

Commencing at the Northwest corner of Section 1; thence S89°53'22"E along the north line of the Northwest 1/4 of Section 1, 1351.13 feet to the point of beginning;
Thence continuing S89°53'22"E, 390.18 feet; thence S00°05'25"W, 450.75 feet; thence S44°41'04"E, 517.83 feet; thence S89°48'12"E, 89.15 feet; thence S00°27'48"W, 537.57 feet to a point on the north right-of-way line of Broadway Street; thence S89°32'42"W along said right-of-way line, 836.39 feet to its intersection with the east right-of-way line of 13th. street; thence N00°05'09"W along said right-of-way line 1364.18 feet to the point of beginning.
Containing 839,838 square feet (19.280 acres) total, more or less and 822,147 square feet (18.874 acres) less the right-of-way of Prairie Street (CTH "PF") and is subject to all easements and rights-of-way of record of use or record, if any.

I DO FURTHER CERTIFY that this is a correct representation of the exterior boundaries of the land surveyed and the subdivision thereof made and that I have complied with the provisions of Chapter 236.24 of the Wisconsin Statutes, AE 7 of the Administrative Code of the State of Wisconsin and the Village of Prairie Du Sac Subdivision Ordinance to the best of my knowledge and belief.

VILLAGE BOARD APPROVAL

Resolved that this Certified Survey Map, located in the **Village of Prairie du Sac,** Sauk County, Wisconsin, along with the public right-of-way dedicated herein, are hereby approved by the **Village Board.**

_____ Dated this ____ day of _____, 2020.
Village President

I hereby certify that the foregoing is a copy of a motion adopted by the **Village Board of Prairie Du Sac.**

_____
Village Clerk

OWNER'S CERTIFICATE OF DEDICATION

As Owner(s), I/we hereby certify that I/we have caused the land on this Certified Survey Map to be surveyed, divided, mapped and dedicated as shown on this Certified Survey Map.

Witness the hand and seal of said Owner on this _____ day of _____, 2020.

_____
Sauk Prairie School District (Authorized Representative)

STATE OF WISCONSIN
SS
COUTY OF SAUK

Personally came before me this ____ day of _____, 2020, the above named person(s) to me known to be the persons who executed the foregoing instrument and acknowledged the same.

_____ _____ **County, Wisconsin**

My Commission expires: _____

WISCONSIN KERRY R ZIMMERMAN S-1625 BARABOO WI AND SURVEYOR

REVISED 5/27/2020

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PROJECT NO.	1621001
DRAWN BY:	KRZ
CHECKED BY:	BK
FILE:	1621001
SHEET NO.	3 of 3

SAUK COUNTY CERTIFIED SURVEY MAP

LOCATED IN LOT 2 OF SAUK COUNTY CERTIFIED SURVEY MAP No. 3341, BEING PART OF THE NORTHEAST 1/4 OF THE NORTHWEST 1/4 OF SECTION 1, TOWN 9 NORTH, RANGE 6 EAST, VILLAGE OF PRAIRIE DU SAC, SAUK COUNTY, WISCONSIN.

PUBLIC ROADWAY DEDICATION

A parcel of land located in the Northeast 1/4 of the Northwest 1/4 of Section 1, Town 9 North, Range 6 East, Village of Prairie du Sac, Sauk County, Wisconsin described as follows:
Commencing at the northwest corner of Section 1; thence S89°53'22"E along the north line of Northeast 1/4 of Section 1, 1351.13 feet to the point of beginning;
Thence continuing S89°53'22"E, 390.18 feet; thence S00°05'25"W, 45.00 feet; thence N89°53'22"E, 364.96 feet to a point of curve; thence along the arc of a curve concave to the southeast, radius 25.00 feet (the chord of which bears S45°00'44"W, 35.42 feet) a distance of 39.36 feet; thence N00°05'09"W, 70.89 feet to the pint of beginning.
Said parcel contains 17,691 square feet or 0.406 acres, more or less and is subject to all other easements and rights-of-way of record and all utilities.

SIDEWALK / WALKWAY AND UTILITY EASEMENT

A parcel of land located in the Northeast 1/4 of the Northwest 1/4 of Section 1, Town 9 North, Range 6 East, Village of Prairie du Sac, Sauk County, Wisconsin described as follows:
Commencing at the northwest corner of Section 1; thence S89°53'22"E along the north line of Northeast 1/4 of Section 1, 1351.13 feet; thence S00°05'09"W, 70.89 feet to the point of beginning;
Thence along the arc of a curve concave to the southeast, radius 25.00 feet (the chord of which bears N29°14'53"E, 24.49 feet) a distance of 25.60 feet; thence S00°05'09"E, 1315.37 feet to a point on the north right-of-way line of Broadway Street; thence S89°832'42"W along said right-of-way line 12.00 feet to its intersection with the west right-of-way line of 13th Street; thence N00°05'09"E along said right-of-way line, 1294.09 feet to the point of beginning.
Said parcel contains 15,710 square feet or 0.361 acres, more or less and is subject to all other easements and rights-of-way of record and all utilities.

REVISED 5/27/2020

Final Design Full Roof Sauk Prairie Police Commission, 440 13th St. Prairie du Sac WI

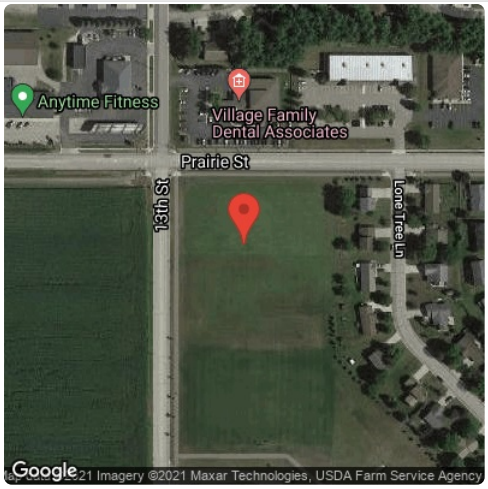
Report

Project Name	Sauk Prairie Police Commission
Project Address	440 13th St. Prairie du Sac WI
Prepared By	Jesse Michalski jessemi@elandelectric.com

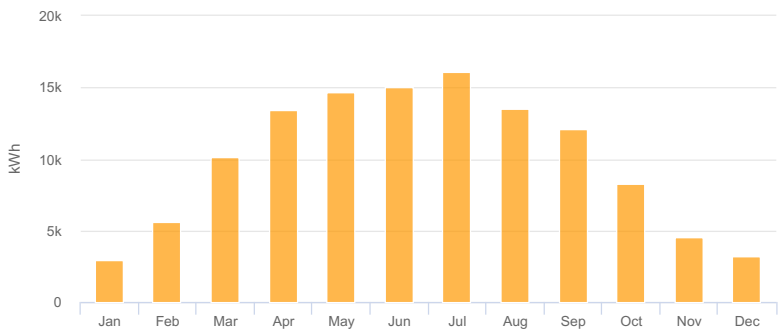
System Metrics

Design	Final Design Full Roof
Module DC Nameplate	94.5 kW
Inverter AC Nameplate	86.4 kW Load Ratio: 1.09
Annual Production	119.4 MWh
Performance Ratio	83.0%
kWh/kWp	1,262.9
Weather Dataset	TMY, 10km Grid (43.25,-89.75), NREL (prospector)
Simulator Version	ea0926960a-190bd19789-2f91c3380c-a59a662583

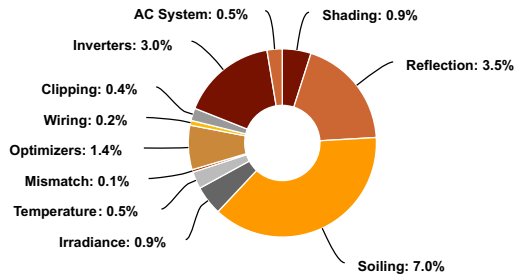
Project Location



Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,405.8	
	POA Irradiance	1,522.0	8.3%
	Shaded Irradiance	1,508.2	-0.9%
	Irradiance after Reflection	1,455.1	-3.5%
	Irradiance after Soiling	1,353.6	-7.0%
	Total Collector Irradiance	**1,353.6**	**0.0%**
Energy (kWh)	Nameplate	128,119.7	
	Output at Irradiance Levels	126,930.7	-0.9%
	Output at Cell Temperature Derate	126,243.8	-0.5%
	Output After Mismatch	126,138.5	-0.1%
	Optimizer Output	124,372.3	-1.4%
	Optimal DC Output	124,180.7	-0.2%
	Constrained DC Output	123,692.9	-0.4%
	Inverter Output	119,967.5	-3.0%
	Energy to Grid	**119,391.6**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		10.4 °C
	Avg. Operating Cell Temp		17.1 °C
Simulation Metrics			
	Operating Hours		4693
	Solved Hours		4693

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km Grid (43.25,-89.75), NREL (prospector)
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
35	25	15	2	2	2	2	2	2	2	15	30

Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Module Characterizations

Module	Uploaded By	Characterization
REC365AA (2020) (REC)	Folsom Labs	Spec Sheet Characterization, PAN

Component Characterizations

Device	Uploaded By	Characterization

Components

Component	Name	Count
Inverters	SE14.4KUS (2020) (SolarEdge)	6 (86.4 kW)
AC Panels	2 input AC Panel	3
AC Home Runs	10 AWG (Copper)	6 (1,221.7 ft)
AC Home Runs	1 AWG (Copper)	3 (1,355.9 ft)
Strings	10 AWG (Copper)	16 (585.4 ft)
Optimizers	P860 (SolarEdge)	131 (112.7 kW)
Module	REC, REC365AA (2020) (365W)	259 (94.5 kW)

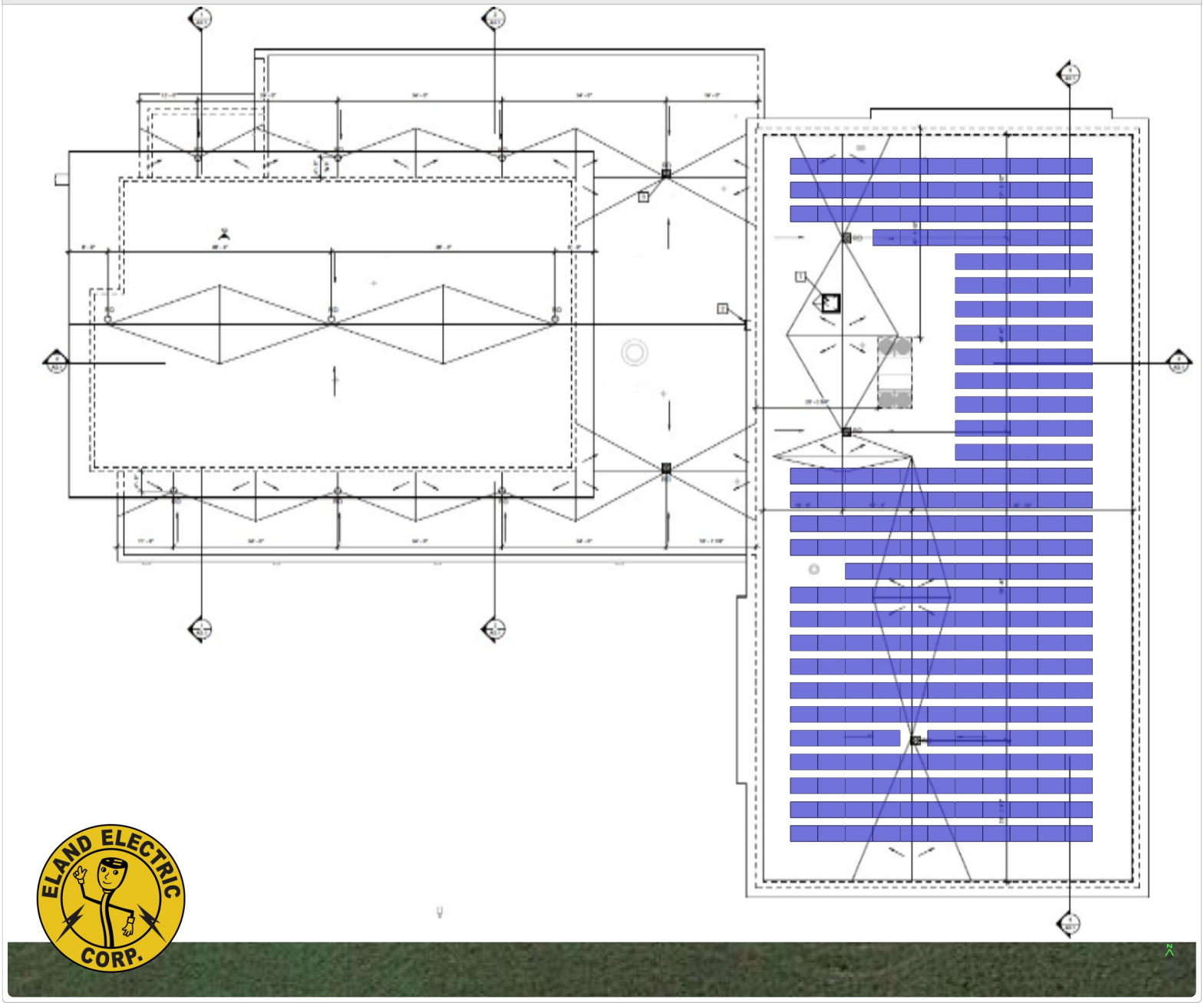
Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	13-17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	10°	180°	1.6 ft	1x1	259	259	94.5 kW

Detailed Layout



VILLAGE OF PRAIRIE DU SAC
SAUK COUNTY
STATE OF WISCONSIN

RESOLUTION No. 09-08-2020(e)

A RESOLUTION DECLARING MUNICIPAL-WIDE ENERGY MANAGEMENT POLICY

WHEREAS, the Village of Prairie du Sac is committed to being an environmentally responsible community and municipally owned and operated utilities dedicated to improving global and local quality of life through active environmental stewardship; and

WHEREAS, it is more cost-effective to use less electricity and natural gas than it is to generate and/or purchase electricity and natural gas for the operation of the Village of Prairie du Sac facilities; and

WHEREAS, the Village of Prairie du Sac and WPPI Energy have developed and implemented mutually beneficial energy efficiency, conservation and renewable energy programs, projects and educational activities designed to increase community energy efficiency, promote clean air and water and reduce waste; and

WHEREAS, the Village of Prairie du Sac already promotes these initiatives through its Commitment to Community programs and partnership with WPPI Energy and Focus on Energy; and

WHEREAS, implementing a municipal-wide energy management policy will require that the Village of Prairie du Sac make a commitment of financial and human resources toward initiatives that save energy and money for the long-term.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Trustees for the Village of Prairie du Sac formally declares that the Village of Prairie du Sac will set a goal to curb use of electricity in municipal facilities by 3% from levels measured in 2020 by 2027; and

BE IT FURTHER RESOLVED, that the Village of Prairie du Sac will demonstrate the effectiveness of energy efficiency, conservation and renewable resource development and further seek to instill a strong conservation ethic within the community that will help establish the Village as a leader in these areas.

Adopted this 14 day of September, 2020.

Village of Prairie du Sac, WI

VILLAGE OF PRAIRIE DU SAC INCORPORATED OCT. 24 1885 SAUK COUNTY, WI

Cheryl A. Sherman
Village President

Niki Conway
Village Clerk

VILLAGE OF
PRAIRIE DU SAC
• MUNICIPAL & UTILITY OFFICES •
335 Galena Street ~ Prairie du Sac, WI 53578 ~ (608) 643-2421

July 20, 2021

Public Service Commission of Wisconsin
Office of Energy Innovation
4822 Madison Yards Way
Madison, WI 53705

Dear Administrator Nieto:

The Village of Prairie du Sac's Electric Utility is pleased to provide this letter supporting the Sauk Prairie Police Commission's Police Station - Emergency Operation Center microgrid study.

The project application will support a stakeholder engaged process for evaluating and conducting a microgrid feasibility study. The team will study and identify potential deployment strategies for solar photovoltaics (PV), energy storage, and other microgrid technologies to bolster resilience at the Sauk Prairie Police Commission's Police Station - Emergency Operation Center against power outages. The study will also model and analyze load profiles, microgrid designs, and project costs/benefits.

Prairie du Sac's Electric Utility understands the value of this project and looks forward to contributing as a strategic and technical partner of the applicant.

Sincerely,

Village of Prairie du Sac

Alan R. Wildman, II
Village Administrator

WPPI ENERGY

1425 Corporate Center Drive Sun Prairie, WI 53590-9109 608.834.4500 wppienergy.org

August 2, 2021

Public Service Commission of Wisconsin
Office of Energy Innovation
4822 Madison Yards Way
Madison, WI 53705

Dear Administrator Nieto:

WPPI is pleased to provide this letter of support for the Sauk Prairie Police Commission Emergency Operation Center microgrid study.

The project application will support a stakeholder engaged process for evaluating and conducting a microgrid feasibility study. The team will study and identify potential deployment strategies for solar photovoltaics (PV), energy storage, and other microgrid technologies to bolster resilience at the Sauk Prairie Police Commission Emergency Operation Center against power outages. The study will also model and analyze load profiles, microgrid designs, and project costs/benefits.

WPPI understands the value of this project and looks forward to contributing as a strategic and technical partner of the applicant.

Regards,

Jake Oelke, P.E.
Vice President – Energy Services

cc: Alan Wildman, Village of Prairie du Sac
Chief Jerry Strunz, Sauk Prairie Police Department