

RFP NO. 318067



DANE COUNTY DEPARTMENT OF PUBLIC WORKS,
HIGHWAY AND TRANSPORTATION

**PUBLIC WORKS
ENGINEERING DIVISION**
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

**REQUEST FOR PROPOSALS NO. 318067
PHOTOVOLTAIC INSTALLATION DESIGN
LUSSIER HERITAGE CENTER & LAKE FARM COUNTY PARK
3113 LAKE FARM ROAD
MADISON, WISCONSIN**

Due Date / Time: **TUESDAY, APRIL 16, 2019 / 2:00 P.M.**

Location: **PUBLIC WORKS OFFICE**

FOR INFORMATION ON THIS REQUEST FOR PROPOSALS, PLEASE CONTACT:

RYAN SHORE, PROJECT MANAGER
TELEPHONE NO.: 608/266/4475
FAX NO.: 608/267-1533
E-MAIL: SHORE@COUNTYOFDANE.COM



Department of Public Works, Highway & Transportation
Public Works Engineering Division

608/266-4018

Gerald J. Mandli, P.E.
Commissioner / Director

Joseph T. Parisi
County Executive

Deputy Director
Todd Draper

1919 Alliant Energy Center Way
Madison, Wisconsin 53713
Fax: 608/267-1533

March 12, 2019

INVITATION FOR PROPOSALS

You are invited to submit a Proposal for RFP No. 318067 to provide professional consulting & engineering design services for Photovoltaic System Design for the Lussier Heritage Center and Lake Farm County Park. The Proposals are due on or before **2:00 p.m., April 16, 2019**. No performance bond is required for this project.

ADDITIONAL INFORMATION

The design of the photovoltaic system will need to provide electrical supply sufficient to meet the needs of the Lussier Heritage Center and Lake Farm Park facilities and be compatible with Madison Gas & Electric requirements. Special consideration must be given to the location, size and appearance of solar arrays so as to not detract from the natural environs of the park.

SPECIAL INSTRUCTIONS

Please provide the entire proposal package in these formats: one (1) unbound original hard copy, two (2) bound hard copies and an electronic version available upon request. Follow these instructions when submitting your proposal:

1. Place the signed Signature Page on top as page 1.
2. Place the signed Fair Labor Practices Certification after the Signature Page as page 2.
3. Place the Proposal information after Fair Labor Practices Certification.
4. Clearly label your envelope containing your proposal in the lower left-hand corner as follows:

Proposal No. 318067

Lake Farm County Park Photovoltaic Installation Design

Tuesday, April 16, 2019, 2:00 p.m.

5. Mail or deliver to:

Ryan Shore, Project Manager
Dane County Department of Public Works, Highway & Transportation
1919 Alliant Energy Center Way
Madison, Wisconsin 53713

If any additional information about this Request for Proposals is needed, please call Ryan Shore at 608/266/4475 or send email to shore@countyofdane.com.

Sincerely,

Ryan Shore

Project Manager

Enclosure: Request for Proposals No. 318067 Package

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RFP Cover Letter
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Sizing, Costing & Feasibility Study – Informational only

LEGAL NOTICE

REQUEST FOR PROPOSALS

Dane County Dept. of Public Works, Hwy & Transp., 1919 Alliant Energy Center Way, Madison, WI 53713, will receive sealed Proposals until:

2:00 P.M., TUESDAY, APRIL 16, 2019

RFP NO. 318067

PHOTOVOLTAIC INSTALLATION DESIGN

LAKE FARM COUNTY PARK

3113 LAKE FARM ROAD

MADISON, WI

Dane County is inviting Proposals for professional architectural and engineering design services. The project includes siting and design of photovoltaic systems at Lake Farm County Park and the Lussier Heritage Center. Only firms with capabilities, experience & expertise with similar projects should obtain this Request for Proposals document & submit Proposals.

Request for Proposals document may be obtained after **2:00 p.m. on Tuesday, March 12, 2019** by downloading it from bids-pwht.countyofdane.com. Please call Ryan Shore, Project Manager, at 608/266-4475 or our office at 608/266-4018, for any questions or additional information.

An informational site tour will be held Wednesday, April 3, 2019 at 1 p.m. at Lake Farm County Park starting at the entrance. Interested firms are strongly encouraged to attend this tour.

PUBLISH: MARCH 12 & MARCH 19, 2019 - WISCONSIN STATE JOURNAL
MARCH 12 & MARCH 19, 2019 - THE DAILY REPORTER



Department of Public Works, Highway & Transportation
Public Works Engineering Division

608/266-4018

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1919 Alliant Energy Center Way
Madison, Wisconsin 53713
Fax: 608/267-1533

www.countyofdane.com/pwht/public_works.aspx

PROPOSAL SIGNATURE PAGE

PROPOSAL NO. 318067

**PROJECT: PHOTOVOLTAIC INSTALLATIONS DESIGN
LUSSIER HERITAGE CENTER & LAKE FARM COUNTY PARK**

The undersigned, submitting this Proposal, hereby agrees with all terms, conditions and requirements of the above referenced Request for Proposals, and declares that the attached Proposal and pricing are in conformity therewith.

SIGNATURE: _____

(Proposal is invalid without signature)

Print or Type Name: _____ Date: _____

Title: _____

Company: _____

Address: _____

Telephone No.: _____ Fax No.: _____

Email Address: _____

Contact Person: _____

Receipt of the following addenda and inclusion of their provisions in this Proposal is hereby acknowledged:

Addendum No(s). _____ through _____

Dated _____

All Proposers are strongly encouraged to be a registered vendor with Dane County. Registering allows vendors an opportunity to receive notifications for RFPs & RFBs issued by the County and provides the County with up-to-date company contact information. Complete a new form or renewal online at: danepurchasing.com/Account/Login?

REQUESTED SERVICES AND BUSINESS INFORMATION

1. GENERAL INFORMATION

- A. Dane County is inviting proposals for professional consulting and engineering design services for Photovoltaic System Design at Lussier Heritage Center and Lake Farm County Park.
- B. To be considered for this project, the Consultant must meet or exceed the following criteria:
 - 1. Have at least one registered professional engineer as lead responsible member of the firm or project team.
 - 2. Have been in business for a period of not less than five (5) years.
 - 3. Must have been responsible for the design and completion of at least three (3) photovoltaic system design projects of similar design scope and size as the Lussier Heritage Center and Lake Farm County Park.
 - 4. Consideration may be given to joint ventures consisting of two or more firms organized for the purpose of furnishing professional services as a single entity, providing the assignment of and provisions for continuity of the various responsibilities within the joint venture are approved by the County, and further providing that either of the individual firms constituting the joint venture meets the eligibility requirements listed above.

C. SCOPE OF WORK

- A. Project deliverables and specific tasks are detailed in the *Architectural / Engineering Professional Services Agreement*.

3. PROPOSAL CONTENT

- A. Interested consultants are requested to submit the following information in their proposal, in eight distinct sections or divisions:
 - 1. Signature Page, Fair Labor Practices Certification and Proposer's cover letter.
 - 2. Description of firm's qualifications, related experience, organization and resources.
 - 3. Brief list (min. of three, max. of five) of similar projects previously completed with the project details, name, address and telephone number of the client for whom the work was done. Specific reference shall be made to projects involving public facilities as is being proposed. You may separately list additional professional references.
 - 4. Description of planning and design techniques to be used in approaching the project.
 - 5. List of staff that will be committed to the Work with their professional resumes. Actual consultant project engineer / architect will be interviewed if firm is short-listed. Include listing of other consultants who may participate in this project and their area of expertise.

6. Indicate staff availability and tentative timetable with project tasks for the Work, including all project phases.
7. Fee for services stated as fixed fee.
8. State clearly any limitations you wish to include in *Architectural / Engineering Professional Services Agreement* and advise of any conditions that you may have.

4. EVALUATION CRITERIA

A. Proposing consultants will be evaluated on this criteria:

Project Personnel	10%
Strength / Capabilities	10%
Relative Experience	15%
Approach to Project	15%
Past Project References	15%
Planning Process	15%
Related Knowledge / Understanding	10%
Pricing / Cost Proposal	<u>10%</u>
Total	100%

5. SITE TOUR

A. A proposing company site tour will be held on Wednesday, April 3rd, 2019 at 1p.m. at the Lussier Heritage Center, 3113 Lake Farm County Park, Madison, Wisconsin, starting in the parking lot. This cursory tour will go until approximately 2p.m.. Proposing companies are strongly encouraged to attend this tour.

7. OWNER’S RESPONSIBILITY

A. Dane County will provide all available building, site, architectural, structural, mechanical, electrical, plumbing, telecommunications, fire protection, and security drawings and specifications to selected A/E firm. These drawings and specifications may not be complete or in an as-built condition. A/E firm will need to confirm accuracy of drawings and specifications. Dane County will provide any necessary hazardous material protection or abatement.

8. TIMETABLE

A. Listed below are specific and estimated dates and times of events related to this RFP. The events with specific dates must be completed as indicated unless otherwise changed by Dane County. In the event that Dane County finds it necessary to change any of the specific dates and times in the calendar of events listed below, it will do so by issuing an addendum to this

RFP. There may or may not be a formal notification issued for changes in the estimated dates and times.

DATE	EVENT
March 12, 2019	RFP issued
April 3, 2019	Site tour
April 9, 2019 - 2:00 p.m.	Written inquiries due
April 11, 2019	Addendum (if necessary)
April 16, 2019- 2:00 p.m.	Proposals due
April 23, 2019 (estimated)	Notification of intent to award sent out
June 4, 2019 (estimated)	Agreement start date
July 10, 2019 (estimated)	Study due
August 7, 2019 (estimated)	Schematic Design due

9. ADDITIONAL INFORMATION

- A. Dane County Department of Public Works, Highway & Transportation, 1919 Alliant Energy Center Way, Madison, Wisconsin 53713, will receive your Proposal.
- B. Information regarding this project may be obtained from Ryan Shore, Public Works Project Manager, 608/266-4475, shore@countyofdane.com.
- C. Since RFP documents are obtained from the Dane County web site, proposing company is responsible to check back there regularly for Addenda.
- D. All Proposals must be submitted by 2:00 p.m., Tuesday, April 16, 2019.
- E. Dane County reserves the right to accept or reject any Proposal submitted.
- F. Information submitted by consultants will be reviewed and candidates [will / may] be scheduled to appear before an interview panel. Those appearing for an interview shall be prepared to discuss their approach for the design of this work, methodology, project team, a timetable, the basis of their fee schedule and answer questions from our staff.
- G. Dane County reserves the right to negotiate an Agreement after the successful firm is selected. Selection will be based only on the proposal submitted and subsequent interviews. Therefore, the proposals must be complete. Submission of a proposal shall constitute a valid offer, which may be accepted by the County for a period of ninety (90) calendar days following the proposal due date.
- H. Dane County is an Equal Opportunity Employer.

FAIR LABOR PRACTICES CERTIFICATION

The undersigned, for and on behalf of the BIDDER, APPLICANT or PROPOSER named herein, certifies as follows:

- A. That he or she is an officer or duly authorized agent of the above-referenced BIDDER, APPLICANT or PROPOSER, which has a submitted a bid, application or proposal for a contract or agreement with the county of Dane.
- B. That BIDDER, APPLICANT or PROPOSER has (check one):

_____ not been found by the National Labor Relations Board (“NLRB”) or the Wisconsin Employment Relations Commission (“WERC”) to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ been found by the National Labor Relations Board (“NLRB”) or the Wisconsin Employment Relations Commission (“WERC”) to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

Officer or Authorized Agent Signature Date

Printed or Typed Name and Title

Printed or Typed Business Name

NOTE: You can find information regarding the violations described above at: www.nlrb.gov and werc.wi.gov.

For reference, Dane County Ordinance 25.09 is as follows:

- (1) BIDDER RESPONSIBILITY. (a) Any bid, application or proposal for any contract with the county, including public works contracts regulated under chapter 40, shall include a certification indicating whether the bidder has been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Committee (WERC) to have violated any statute or regulation regarding labor standards or relations within the last seven years. The Controller shall investigate any such finding and make a recommendation to the committee, which shall determine whether the conduct resulting in the finding affects the bidder’s responsibility to perform the contract.

If you indicated that the NLRB or WERC have found you to have such a violation, you must include copies of any relevant information regarding such violation with your proposal, bid or application.

Include this completed Certification with your bid, application or proposal.

COUNTY OF DANE
ARCHITECTURAL / ENGINEERING PROFESSIONAL SERVICES AGREEMENT
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COUNTY OF DANE

ARCHITECTURAL / ENGINEERING PROFESSIONAL SERVICES AGREEMENT

SIGNATURE PAGE

Date: [Date]

Project No.: 318067

Agreement No.:

THIS AGREEMENT is between the County of Dane, by its Department of Public Works, Highway & Transportation, hereinafter referred to as "COUNTY", and [A/E Name, Address, City, State, Zip], hereinafter called the "A/E".

WITNESSETH

WHEREAS, COUNTY proposes securing architectural / engineering services for a project described as follows:

Lussier Heritage Center & Lake Farm County Park Photovoltaic Installations Design WHEREAS, COUNTY deems it advisable to engage the services of the A/E to furnish professional services in connection with this project, and

WHEREAS, COUNTY has authority to engage such services, and

WHEREAS, the A/E represents that it is in compliance with the applicable Wisconsin Statutes relating to the registration of architects and professional engineers and designers, and has agreed to furnish professional services for COUNTY.

NOW, THEREFORE, in consideration of the premises and to their mutual and dependent agreements, the parties hereto agree as set forth in the following pages, which are annexed hereto and made a part hereof.

IN WITNESS WHEREOF, COUNTY and the A/E have executed this Agreement as of the above date.

[A/E Firm Name] COUNTY OF DANE

Signature Date

Joseph T. Parisi, County Executive Date

Printed Name

Scott McDonell, County Clerk Date

Title

Federal Employer Identification Number (FEIN)

1. ARTICLE 1: SCOPE OF AGREEMENT

- 1.A. This Agreement between COUNTY and the person or firm, duly licensed under the laws and in accordance with the regulations of the State of Wisconsin, hereinafter referred to as the "A/E" shall be governed by the following Terms and Conditions.
- 1.B. The A/E shall provide technical and professional services under this Agreement. The Terms and Conditions of this Agreement shall apply to modifications made to this Agreement and shall apply to both the services rendered in the creation of the design and to the additional services called for in carrying out the design.
- 1.C. The A/E shall serve as the professional technical advisor and consultant to COUNTY in matters arising out of or incidental to the performance of this Agreement and in that capacity, the A/E shall not have a contractual duty or responsibility to any other person or party or individual regarding the services under this Agreement, except as that duty may arise under the laws of the State of Wisconsin. The A/E is not an agent of the COUNTY within the meaning of s. 893.80 or 895.46, Wis. Stats.
- 1.D. Professional services performed or furnished under this Agreement shall be based on the care and skill ordinarily used by members of the profession involved, who practice under the authority of and who are governed by the license issued under the Wisconsin Statutes and the Wisconsin Administrative Code. The standard of care for architectural and engineering services under this Agreement shall include designing buildings, structures and / or related infrastructural systems that comply with all applicable building and safety codes.
- 1.E. By accepting this Agreement, the A/E represents possession of the necessary skill and other qualifications to perform work under this Agreement and is familiar with the practices in the locality where such services and work shall be performed.
- 1.F. The A/E shall review and become familiar with the current Division 00 & 01 requirements utilized by COUNTY in construction contracts and shall provide services and work, consistent with such requirements, so that the Contractor's schedule is not negatively impacted.
- 1.G. The A/E shall be professionally responsible for work performed under this Agreement. Upon written approval of COUNTY, the A/E may subcontract work to an approved consultant under this Agreement, to the specific extent authorized by COUNTY. The authorization to subcontract shall not relieve the A/E of professional or contractual responsibility for any work performed or delivered under this Agreement. The authorization to subcontract shall not be construed to create any contractual relationship between COUNTY and such consultant.
- 1.H. Subcontracts for services under this Agreement shall provide that work performed under such subcontract, shall be subject to provisions of this Agreement and shall also provide that any professional duty or responsibility pertaining thereto shall be accomplished to the benefit of COUNTY. Upon request, an electronic copy of each such subcontract for which COUNTY approval is granted shall be furnished to COUNTY.
- 1.I. In the performance of this Agreement, the A/E shall become familiar with and perform such services in accordance with the specifications set forth in the [Request for Proposals, Scope of Work / Request for Quotes, Request for Quotes] document. The COUNTY reserves the right to update County Master Specifications Division 00 and Division 01 at any time, including after the signing date of this Agreement.

2. ARTICLE 2: SCOPE OF THE SERVICES TO BE PROVIDED

2.A. General:

2.A.1) Services are to be provided by the A/E in each of the following phases:

- Study Phase
- Schematic Design Phase
- Design Development Phase
- Construction Documents Phase
- Bidding Phase

2.A.2) An assigned COUNTY Public Works Project Manager will be the A/E's contact in securing COUNTY direction and for arranging the necessary meetings with COUNTY or other County Departments and obtaining the approvals required by COUNTY.

2.A.3) The A/E shall facilitate a site investigation for the purpose of identifying conditions at the site which might adversely affect the achievement of the proposed design.

2.A.4) The term "written" or "in writing" may be either electronic or hard copy documentation, unless otherwise stated or directed by COUNTY.

2.B. Study Phase:

2.B.1) The A/E shall obtain from COUNTY information and materials necessary to ascertain scope of the Project and shall verify with COUNTY program and functional requirements of the Project. This shall include gathering information from Parks Dept. staff subject to approval by the COUNTY Public Works Project Manager.

2.B.2) Based on information, materials and requirements as verified by COUNTY, A/E shall prepare a Summary and Study consisting of text, drawings and other documents illustrating scale and relationship of the Project components. Draft version of Study shall be submitted to COUNTY for review, modifications and written approval before submitting Final version.

2.B.3) The A/E shall submit to COUNTY in the Summary and Study, a construction cost estimate based on information provided by COUNTY and gathered by A/E for Final version of Study.

2.B.4) Study Phase deliverables shall be:

2.B.4) a. Draft Study, electronic copies of:

- (1) Word 2010 (or earlier version);
- (2) Any other files (e.g., AutoCAD 2014, Excel 2010, PowerPoint 2010, etc. (or earlier versions)) included in Study; and
- (3) Adobe Acrobat 11 (or earlier version) (PDFs converted from Word, AutoCAD, or other programs; minimize pdf file size by converting files rather than scanning printouts).

2.B.4) b. Final Study:

- (1) Original unbound, hard copy in 8½ x 11 and / or 11 x 17 format prints;
- (2) Two, (2) bound, hard copies in 8½ x 11 and / or 11 x 17 format;
 - (a) Electronic version of all documents delivered via email Word 2010 (or earlier version);
 - (b) Any other files (e.g., AutoCAD 2014, Excel 2010, PowerPoint 2010, etc. (or earlier versions)) included in Study; and
 - (c) Adobe Acrobat 11 (or earlier version) (PDFs converted from Word, AutoCAD, or other programs; minimize pdf file size by converting files rather than scanning printouts).

2.C. Schematic Design Phase:

2.C.1) The A/E shall obtain from COUNTY information and materials necessary to ascertain scope of the Project and shall verify with COUNTY program and functional requirements of the Project. This shall include gathering information from Parks Dept. Staff subject to approval of COUNTY Public Works Project Manager.

2.C.2) Based on information, materials and requirements as verified by COUNTY, the A/E shall prepare Schematic Design Documents consisting of drawings and other documents illustrating scale and relationship of the Project components. Schematic Design Documents shall be submitted to COUNTY for written Approval.

2.C.3) The A/E shall submit to COUNTY construction cost estimates based on information provided by COUNTY and approved Schematic Design Documents.

2.C.4) Schematic Design Phase deliverables shall be:

2.C.4) a. Two (2) bound, hard copies of all drawings & outline specifications; and

2.C.4) b. Electronic version of all documents delivered via email:

- (1) Word 2010, AutoCAD 2014 (or earlier versions); and
- (2) Adobe Acrobat 11 (or earlier version) (PDFs converted from Word, AutoCAD, or other programs; minimize pdf file size by converting files rather than scanning printouts).

2.D. Design Development Phase:

2.D.1) The A/E shall review the program and functional requirements, plans and specifications of record, (to the extent that such documents are reasonably available), and applicable COUNTY standards and guides or other written direction by COUNTY. The A/E shall establish the limiting parameters of the design as defined by the instructions issued to it by COUNTY, to determine if the design concept is achievable within the schedule and budget proposed by COUNTY.

2.D.2) To the extent necessary, the A/E shall facilitate investigation of the site for existing conditions which differ from those indicated in the record drawings or which could have a detrimental impact on the achievement of the work called for under the project.

2.D.3) Within seven (7) calendar days of receipt of the program and functional requirements, plans and specifications of record, the A/E and COUNTY shall schedule a meeting to review the A/E's design concept and such other matters as

are necessary to establish that at this preliminary point, the proposed design concept is consistent with the requirements of COUNTY.

- 2.D.4) The A/E shall document the results of design meetings, including design factors agreed to, with any instructions furnished by COUNTY to carry out such factors, including, but not limited to:

- Program clarification
- Scheduling concerns
- Existing site conditions
- Project cost estimates
- Cost-value trade offs
- Quality requirements
- Special material requirements
- Communications requirements
- Engineering requirements

- 2.D.5) The A/E shall furnish a copy of the documentation produced under this Paragraph to each participant attending a design concept meeting.

- 2.D.6) In agreements which involve renovation or remodeling of or additions to existing facilities, the A/E shall evaluate the suitability of existing building elements, materials and equipment for reuse in the renovated project. Reasonably accessible areas shall also be observed by the A/E or its consultants to evaluate existing major mechanical, plumbing and electrical systems. Any of the foregoing considered to be economically reusable shall be reported to COUNTY and may be reused unless directed otherwise by COUNTY.

- 2.D.7) The A/E shall provide sufficient, alternative design solutions on major design features to allow COUNTY to ascertain that the recommended design achieves a practical programmatic and economic solution, within the limitations of the authorized program, schedule and budget. Include staffing and occupancy considerations provided by COUNTY.

- 2.D.8) The major design features, equipment and systems that must be evaluated include, but are not limited to:

- Site & civil related work
- Structural systems
- Electrical & associated controls

- Facility signage

- 2.D.9) The A/E shall provide a working analysis of each major design feature included in the selected design concept, with constraints and dependencies that is sufficiently complete to allow commencement of the Construction Documents Phase.

- 2.D.9) a. The A/E shall prepare preliminary drawings, specifications and other data tailored to the project that fix and describe the size and character of the entire project as to major design features and systems and such other essentials outlined by COUNTY.

- 2.D.9) a.(1) The preliminary drawings shall include plans, elevations, sections and details at a scale which is sufficient to fully illustrate the

design concepts, materials and finishes to be employed. Drawings shall be in format as approved by COUNTY.

2.D.9) a.(2) The outline specifications shall include relevant specific information for Division 01 - Bidding and Contract Requirements and a list of the applicable technical divisions.

2.D.9) b. The A/E shall prepare a Design Report that includes:

2.D.9) b.(1) A time estimate for completion of each separate phase of the work (Design, Construction Documents, Bidding and Construction).

2.D.9) b.(2) A detailed estimate of project cost based on the preliminary design concept, which indicates that the project budget limitations will not be exceeded. Factors influencing the cost feasibility of each major division of the specification and related drawings shall be identified.

2.D.9) b.(3) An analysis of the biddability and constructability of the project within the time allowed by COUNTY.

2.D.9) b.(4) An identification of any part of the work that might require special monitoring or consideration during construction to prevent quality control problems, delays, or cost escalation. Include any long lead time equipment or materials, items which interface with difficulty, areas of work requiring significant care, sequencing or precision in installation and full or partial User occupancy during construction.

2.D.9) b.(5) As a safeguard against unforeseen bidding conditions, the A/E may recommend appropriate alternate bids for COUNTY's consideration. Such alternates shall be identified and developed at no additional cost to this Agreement.

2.D.10) Upon determination by the A/E that the final design is represented by the preliminary drawings and specifications, those documents along with a final Design Report shall be submitted to COUNTY for review and concurrence prior to commencement of Construction Documents.

2.D.10) a. The A/E shall provide COUNTY with up to four (4) sets and one (1) electronic file of the Design Report with appendix, preliminary drawings and outline specifications for review and coordination purposes. Electronic documents shall be in a format approved by COUNTY.

2.D.10) b. COUNTY will issue a list of recommended changes/corrections to be incorporated into the documents. Within seven (7) calendar days of receipt, the A/E shall transmit written replies to review comments issued by COUNTY. Directions by COUNTY shall be incorporated into the design, unless the A/E shall have explained objections to COUNTY and obtained prior written approval of noncompliance from COUNTY before proceeding with related work.

2.D.10) c. The A/E or COUNTY may call a further preliminary review meeting, when necessary to finalize the design concept. Written replies to additional

COUNTY comments shall be made before proceeding to the Construction Documents Phase.

2.D.10) d. Approval of these documents by COUNTY will complete the Design Development Phase, whereupon COUNTY will issue written instruction to the A/E to proceed to the Construction Documents Phase.

2.D.11) Design Development Phase deliverables shall be:

2.D.11) a. Two (2 bound, hard copies of drawings (full size-typical of all submissions) & specifications (in 8½ x 11 format-typical of all submissions); and

2.D.11) b. Electronic version of all documents delivered via email

- (1) Drawings in AutoCAD 2014 (or earlier version);
- (2) Specifications in Word 2010 (or earlier version); and
- (3) Adobe Acrobat 11 (or earlier version) of drawings and specifications (PDFs converted from Word, AutoCAD, or other programs; minimize pdf file size by converting files rather than scanning printouts).

2.E. Construction Documents Phase:

2.E.1) Upon receipt of written instructions from COUNTY, the A/E shall prepare Construction Documents for bidding and construction of the project. The Construction Documents shall provide the detailed requirements for the successful construction of the entire project.

2.E.2) Construction Documents shall comply with the COUNTY Master Specifications Division 00 and Division 01.

2.E.3) The Construction Documents shall be internally consistent in terms of coordination between:

2.E.3) a. Work of the A/E and its consultants.

2.E.3) b. Requirements of various divisions or trades.

2.E.3) c. Drawings and specifications.

2.E.4) During this phase, the A/E shall develop and provide documents for the systems designed under this Agreement which will achieve a biddable and constructible project, compliant with all applicable building and safety codes and within the assumption of professional responsibility set forth in this Agreement. These services shall include, but not be limited to:

2.E.4) a. Coordination, to protect the integrity of the design and facilitate construction with:

2.E.4) a.(1) Manufacturers: Ensure that manufactured items called for in the documents are currently available and will fit, interface and perform as required to achieve design intent.

2.E.4) a.(2) Consultants: Ensure that information necessary to their work is provided in a timely manner and that consultants exchange information with each other and the A/E.

2.E.4) a.(3) Occupying Agency: Ensure that program-required furniture, finishes and equipment layout is suitable so as to be compatible but not interfere with access to, placement or operation of the mechanical, electrical or plumbing appurtenances.

2.E.4) a.(4) Governmental authorities having jurisdiction over the work:

2.E.4) a.(4)(a) The A/E shall submit documents for approval to public agencies having jurisdiction over the project and after obtaining such approval of those agencies, the A/E shall file two (2) copies of such approval with COUNTY.

2.E.4) a.(5) Such other agencies, boards, associations or individuals whose activities could impact or interfere with the successful completion of the project.

2.E.4) b. Inclusion in the Construction Documents of:

2.E.4) b.(1) Plans, elevations and sections at a scale which is sufficient to give a full and complete understanding of the construction, dimensions thereof, materials to be employed, location of utilities and any other pertinent data.

2.E.4) b.(2) Details, diagrams, schedules, photo reproductions and other graphic methods appropriate to define work required to be performed to accomplish the purposes of the project.

2.E.4) b.(3) Description of existing conditions of site and / or structures with sufficient clarity to permit their use without ambiguity in the bidding and construction process.

2.E.4) c. Inclusion in the specifications documents of bidding and contract requirements, special provisions and / or appendices, and technical sections. Unless otherwise agreed to by COUNTY in writing, the format shall generally follow the divisions of the Construction Specifications Institute. If approved by COUNTY in writing, short form specifications for limited scope work may be included on the drawings in lieu of Construction Specifications Institute format specification sections.

2.E.4) c.(1) The technical sections of the specifications shall completely and concisely describe the materials and services to be employed or installed by the construction contractor(s) in the work. These specifications shall describe the work to be done and shall be arranged by work or material in appropriate divisions with suitable cross-references for clarity and continuity.

2.E.4) c.(2) The technical sections of the specifications shall be carefully worded to allow a clear understanding of the work required by each of the construction contractors and their subcontractors, and to describe the responsibility for the work required to be performed by such contractor(s), individually and collectively, for the performance of work required to deliver the project complete, without ambiguity as to which technical sections of the specifications cover each element of work.

- 2.E.4) c.(3) The technical sections of the specifications shall clearly state the minimum grade, quality, and type of materials and workmanship required. These specifications shall not restrict competition, where it is available, but shall state a level of quality, which can be objectively determined by persons normally engaged in the type of trade or practice described.
- 2.E.4) c.(4) When two (2) or more manufacturers offer on the open market materials, equipment or devices of equal quality and usability needed for the project, each such known manufactured product shall be specified for potential use on the project.
- 2.E.4) c.(5) The professional judgment of the A/E or the direction of the COUNTY may limit competition to a brand name, process, or technique of manufacture.
- 2.E.4) c.(6) The A/E shall compile and include in the construction contract documents a summary listing of all submittals required for the project from the construction contractor(s). Included shall be shop drawings, samples, cuts, catalogs, models, mockups and other preliminary information needed from the contractors to describe how they will fulfill their responsibilities under their contracts.
- 2.E.5) Upon determination by the A/E that the final project design is represented by completed Construction Documents, those documents shall be submitted to COUNTY for review and concurrence prior to release for bidding.
- 2.E.5) a. The A/E shall provide COUNTY with review sets in a format and standard specified by the COUNTY.
- 2.E.5) b. COUNTY will issue a list of recommended changes/corrections to be incorporated into the next review set or final documents. The A/E shall within seven (7) calendar days transmit written replies from the A/E and its sub-consultants to review comments issued by COUNTY or for which clarification requests were identified or for which changes were authorized at the final design review meeting and communicated to the A/E. Directions by COUNTY shall be incorporated into the documents.
- 2.E.6) Prior to submission of the final documents, the A/E shall call for a final review meeting with COUNTY, if needed, to finalize and prepare for publication of the final bidding documents, with any conditions required by COUNTY.
- 2.E.7) Upon receipt of the Construction Documents Phase deliverables, updated Design Report & FF&E Report, the Project Planning Team shall evaluate these documents & indicate to the A/E in writing when & how to proceed.
- 2.E.8) COUNTY will print and distribute drawings and specifications for bidding purposes without cost to the A/E. The A/E shall provide the original drawings, original specifications and an electronic copy of both the drawings and original specifications for printing by COUNTY, in a format as approved by COUNTY. If the A/E is directed by COUNTY to acquire the necessary printing services, these services shall be a reimbursable expense as provided in Article 4.C. hereof.
- 2.E.9) Constructions Documents Phase deliverables shall be:

2.E.9) a. 60% Construction Documents:

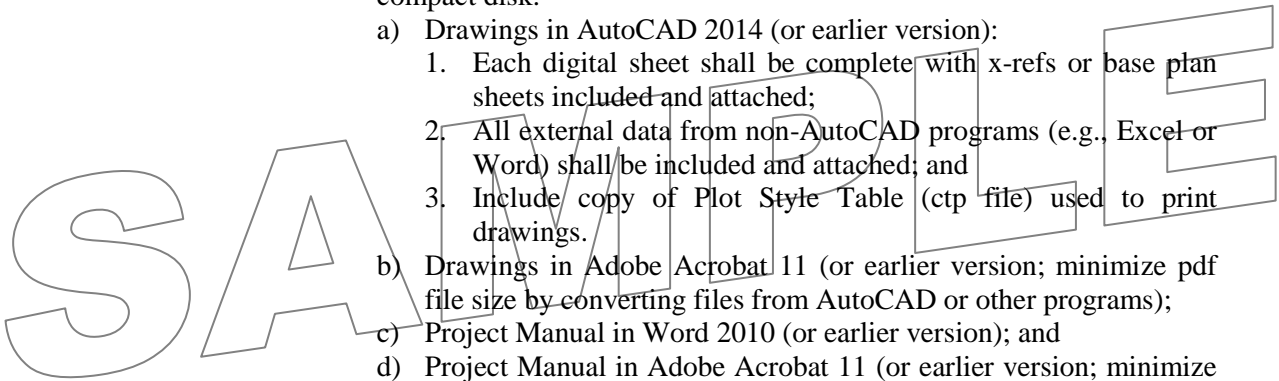
- (1) One (1) hard, bound copy of Drawings & Specifications.

2.E.9) b. 95% Construction Documents:

- (1) Two (2) hard, bound copy of Drawings & Project Manual.
- (2) Electronic version of all documents delivered via email:
 - a) Drawings in Adobe Acrobat 11 (or earlier version; PDFs); and
 - b) Project Manual in Word 2010 (or earlier version).

2.E.9) c. Final Construction Documents:

- (1) Original unbound, hard copy of Drawings and Project Manual in full size, paper format;
- (2) Two (2) bound, hard copies of Drawings and Project Manual;
- (3) One (1) bound, hard copy of Drawings and Project Manual to be submitted by A/E to State of Wisconsin, City of Madison, other entity for stamped approval; and
- (4) Electronic version of all documents delivered on a USB flash drive or compact disk:
 - a) Drawings in AutoCAD 2014 (or earlier version):
 1. Each digital sheet shall be complete with x-refs or base plan sheets included and attached;
 2. All external data from non-AutoCAD programs (e.g., Excel or Word) shall be included and attached; and
 3. Include copy of Plot Style Table (ctb file) used to print drawings.
 - b) Drawings in Adobe Acrobat 11 (or earlier version; minimize pdf file size by converting files from AutoCAD or other programs);
 - c) Project Manual in Word 2010 (or earlier version); and
 - d) Project Manual in Adobe Acrobat 11 (or earlier version; minimize pdf file size by converting files from Word or other programs, rather than scanning printouts).



2.F. Bidding Phase:

- 2.F.1) The Bidding Phase shall commence with the publication of the Invitation to Bid and shall conclude with the award of the number of contracts necessary to achieve the purposes of construction.
- 2.F.2) The A/E shall serve as the professional technical consultant and advisor to COUNTY during the bidding process, including the preparation for and participation in Pre-Bid Conferences.
- 2.F.3) The A/E shall answer all pre-bid questions from contractors in an addendum and prepare any additional addenda necessary, for COUNTY to authorize, print and distribute as appropriate.
- 2.F.4) The A/E shall assist COUNTY in analyzing bids and negotiating with the lowest, qualified, responsible bidders as deemed appropriate by COUNTY.
- 2.F.5) In the event that there is a reduction in scope to keep the project within budget and this results in low bid(s) which total less than the construction budget, then

the A/E shall, at no additional fee, prepare construction bulletin(s) to add deleted program work back into the project.

- 2.F.6) If the low bids submitted by qualified, responsible bidders exceed construction cost estimate approved at Construction Documents Phase by five percent (5%) or more, the A/E shall revise and change the Construction Documents for a project rebidding, as approved by and without additional cost to COUNTY that will permit a proper award of the contract(s) within the approved estimate of project cost or other funding limitation. If the low bid exceeds construction cost estimate approved at Construction Documents Phase by less than five percent (5%), at the COUNTY's option, the A/E shall revise and change the Construction Documents for a project rebidding, as approved by COUNTY, but shall be compensated for revisions per negotiated amendment to this Professional Services Agreement.

2.G. Construction Phase: Not Used

3. ARTICLE 3: COUNTY'S RESPONSIBILITIES

- 3.A. COUNTY will determine the project scope for which the professional design services are required and will fully cooperate in achieving completion of that work.
- 3.B. COUNTY will establish an internal operating procedure for timely and proper performance of any COUNTY duty required to fulfill the needs of the project.
- 3.C. COUNTY will provide available information regarding the requirements for the project, which set forth COUNTY's objectives for program, schedule and overall budget. COUNTY will make available to the A/E data known to COUNTY or requested by the A/E, which may be needed for the fulfillment of the professional responsibility of the A/E. This data may include, but is not limited to, prints of existing buildings or record drawings and COUNTY standards and guides. Such documents will be the most recent and accurate available. The use of any such data by the A/E shall be without contractual or legal significance unless otherwise established elsewhere in this Agreement. However, providing of documents by COUNTY shall not relieve the A/E from the responsibility for conducting a field survey to verify existing conditions as specified herein.
- 3.D. COUNTY will communicate to the A/E the format of the documents required to be submitted.
- 3.E. COUNTY will examine documents submitted by the A/E and will render decisions regarding them promptly, to avoid unreasonable delay in the progress and sequence of the A/E's work. COUNTY will coordinate review comments from the User agency and COUNTY staff prior to issuance to the A/E.
- 3.F. COUNTY will distribute Construction Documents and any necessary addenda to prospective bidders, and conduct the bid opening for the project.
- 3.G. COUNTY will prepare and process the Agreements between COUNTY and A/E, and between COUNTY and construction contractor(s).
- 3.H. Unless otherwise specified in this Agreement, COUNTY will arrange for services of a testing laboratory to furnish structural, chemical, mechanical and other laboratory tests, inspections and reports as required by law or deemed necessary by COUNTY.

4. ARTICLE 4: COMPENSATION

4.A. A/E fees for basic services will be compensated by COUNTY in accordance with the Terms and Conditions of this Agreement as follows:

4.A.1) COUNTY will pay the A/E a lump sum fee of \$[] .

4.A.1) a. The A/E fee for professional services shall be in accordance with the terms of this Agreement and based on the scope of services contained in the Request for Proposals dated March 12, 2019, including any subsequent Addenda.

4.A.1) b. The A/E is authorized to proceed through completion of the Bidding Phase. The A/E Fee is limited to \$[], until written instructions to proceed are provided by COUNTY.

4.A.1) c. The construction budget for this project is \$TBD. This amount excludes all construction costs of contingency and unless stated otherwise in this Agreement, hazardous materials abatement or remediation.

4.A.2) No change in fee shall result from change orders to construction contracts unless such change is described as an Additional Service under Article 4.D. of this Agreement and approved by COUNTY.

4.A.3) In the event the lowest acceptable construction bids exceed the fixed limit of construction, as shown above plus any COUNTY increases approved before bidding, COUNTY will do one or more of the following:

4.A.3) a. Cooperate in revising the project scope and quality as required to reduce the project cost;

4.A.3) b. Authorize the rebidding of the project within a reasonable time; and / or

4.A.3) c. Give written approval of an increase in such fixed limit.

4.A.4) In the case of 4.A.3.a. above, the A/E shall revise the drawings and specifications as necessary to bring the construction cost within the fixed limit. These revisions shall be completed by the A/E without additional compensation.

4.A.5) In the case of 4.A.3.a. or 4.A.3.b. above, no additional fees will be allowed for rebidding or for an increase in allocated funds.

4.B. The A/E's Compensation for Additional Services, as described in Article 4.D., will be computed as follows:

4.B.1) Principals' time at a fixed rate of \$[] per hour, unless separate amounts are provided for each Principal. For the purposes of this Agreement, the Principals are:

[]

[]

[]

4.B.2) Other design staff shall be billed at these fixed rates:

Senior design architect / engineer: \$[] per hour

Junior design architect / engineer: \$[] per hour

Senior designer: \$[] per hour

Junior designer: \$[] per hour

Drafting: \$[] per hour

Clerical: \$[] per hour

4.C. Reimbursable Expenses:

4.C.1) Reimbursable Expenses are actual, incidental expenses incurred by the A/E, its employees or consultants, in the interest of the project and are not included in overhead costs for the Fees for Basic Services (4.A.) and Additional Services (4.D.). Reimbursable Expenses shall be incurred or contracted for only with PRIOR written approval from COUNTY. Such approval shall be based on a written proposal delineating the nature of the services, the time involved, the estimated cost thereof, and the individuals or firms involved. Reimbursable Expenses may include, but are not limited to, the following incidental expenses:

4.C.1) a. Expense of reproduction of drawings and specifications, excluding the review sets required in Article 2.

4.C.1) b. Expense of a site survey/when needed.

4.C.1) c. Expense of a geotechnical investigation and soils and material testing when required.

4.C.1) d. Expense of State and / or City review fees when required.

4.C.2) Expenses not eligible for reimbursement shall include, but are not limited to, indirect project overhead costs associated with the Fees for Basic Services (4.A.) and Additional Services (4.D.) such as mileage, travel, lodging, replication of drawings for the design development meetings and subsequent design meetings, preliminary and final review document printing, handling and postage, cost of correspondence transmittals, telephone expenses, and CAD / electronic graphic services. Such expenses shall be included as part of the Lump Sum fee.

4.D. Additional Services:

4.D.1) The following services are in addition to but are not covered in Article 4.A. These services may be identified as part of the A/E's fee proposal and included with the lump sum fee as such. Compensation for these additional services or other services must be requested by the A/E, and subsequently approved by COUNTY PRIOR to proceeding with the work. If the additional services are requested after the Agreement has been issued, such authorization shall be based on a written proposal delineating the nature of the services, the time involved, the estimated cost thereof, the effect on the project schedule and the individuals or firms involved. When authorized, an Agreement Change Order will be used to modify the A/E's Agreement.

4.D.1) a. Providing planning surveys, program revision, site feasibility, or comparative studies of prospective sites.

- 4.D.1) b. Revising previously approved drawings, specifications or other documents [after written approval of Design Development Phase,]to accomplish changes not initiated by the A/E other than record documents and revisions normally to be expected or required to correct deficiencies in the approved drawings and specifications.
- 4.D.1) c. Preparing documents for alternate bids or petitions for waiver when requested by COUNTY and, requiring significant additional time and expense on the part of the A/E or its consultants.
- 4.D.1) d. Obtaining or participating in third party Value Engineering / Enhancement of the project when directed by COUNTY.
- 4.D.1) e. Providing services other than corrective design work and record documents, after final payment to the construction contractor(s).
- 4.D.1) f. Providing services as expert witness in connection with any public hearings, arbitration proceeding, or the proceedings of a court of record except when the A/E is party thereto.
- 4.D.1) g. Providing specialized design services, including, but not limited to Sustainability design or LEED certification, vibration, wind or acoustical analysis, energy modeling.
- 4.D.1) h. Participation in post-project evaluations.

SAMPLE

4.E. Payments to the A/E:

4.E.1) Payments of the A/E's lump sum fee will be made at the completion of each phase of the work, as confirmed by COUNTY, to the following percentages:

Schematic Design Phase	15%
Design Development Phase	35%
Construction Documents Phase	75%
Bidding Phase	100%
Commissioning	100%

- 4.E.2) No more than ninety percent (90%) of the A/E's lump sum fee shall be paid out prior to substantial completion of the project. When COUNTY confirms that development of punch lists, review of Operating & Maintenance Manuals, submittal of record documents, has been satisfactorily completed by the A/E, COUNTY will determine how and when the remaining lump sum fee is disbursed.
- 4.E.3) Payments for COUNTY-approved Reimbursable Expenses as defined in Article 4.C. and Additional Services of the A/E as defined in Article 4.D., will be made monthly upon request.
- 4.E.4) An A/E whose work is found deficient or fails to conform to the requirements set forth in the Agreement, is not entitled to further payments, until corrected to the satisfaction of COUNTY.

- 4.E.5) Payments to the A/E will not be withheld due to disputes between construction contractor(s) and COUNTY.
- 4.E.6) If the project is suspended for more than three (3) months in whole or in part, the A/E will be paid fees for services performed prior to receipt of written notice from COUNTY of the suspension, together with Reimbursable Expenses then due and reasonable expenses resulting from this suspension, as approved by COUNTY. If the project is resumed after being suspended for more than three (3) months, the A/E's compensation will be subject to renegotiation.

5. ARTICLE 5: ACCOUNTING RECORDS - NOT USED

6. ARTICLE 6: TERMINATION OF AGREEMENT

- 6.A. This Agreement may be terminated by COUNTY without cause upon ten (10) calendar days written notice to the A/E. In the event of termination, the A/E will be paid fees for services performed to termination date, reimbursable expenses then due, and termination expenses as approved by COUNTY. Work performed prior to the date of termination shall be in accordance with the terms and conditions of this Agreement. Upon termination, the results of such work shall immediately be turned over to the COUNTY Project Manager and is a condition precedent to further payment by COUNTY.
- 6.B. In the event the Agreement between the A/E and any consultant on this project is terminated, the results of work by that consultant shall immediately be turned over to the A/E.

7. ARTICLE 7: OWNERSHIP OF DOCUMENTS

- 7.A. All drawings and specifications, renderings, models, scale details, approved copies of shop drawings and other such documents prepared by the A/E or any consultant pursuant to this Agreement shall become the property of COUNTY on completion and acceptance of any of the A/E's work, or upon termination of the Agreement, and shall be delivered to COUNTY upon request.
- 7.B. Documents prepared under this Agreement may be used by COUNTY for informational purposes without additional compensation to the A/E.
- 7.C. Specifications and isolated, detail drawings inherent to the architectural / engineering design of the project, whether provided by the COUNTY or generated by the A/E, shall be available for future use by the parties to this Agreement and other parties, each at their own risk.

8. ARTICLE 8: LIABILITY- HOLD HARMLESS AND INDEMNIFICATION

- 8.A. A/E shall indemnify, hold harmless and defend COUNTY, its boards, commissions, agencies, officers, employees and representatives against any and all liability, loss (including, but not limited to, property damage, bodily injury and loss of life), damages, costs or expenses which COUNTY, its officers, employees, agencies, boards, commissions and representatives may sustain, incur or be required to pay by reason of A/E furnishing the services required to be provided under this Agreement, provided, however, that the provisions of this paragraph shall not apply to liabilities, losses, charges, costs, or expenses caused or resulting from the acts or omissions of COUNTY, its agencies, boards, commissions, officers, employees or representatives. The obligations of A/E under this paragraph shall survive the expiration or termination of this Agreement.

9. ARTICLE 9: PROFESSIONAL LIABILITY INSURANCE

9.A. The A/E and its consultants retained under the terms of this Agreement shall procure and maintain a professional liability insurance policy with at least \$1,000,000 in coverage that provides for payment of the insured's liability for errors, omissions or negligent acts arising out of the performance of the professional services required under this Agreement. The A/E shall provide up-to-date, accurate professional liability information on the A/E's Data Record, including amount of insurance, deductible, carrier and expiration date of coverage. Upon request by COUNTY, the A/E shall furnish COUNTY with a Certificate of Insurance showing the type, amount, deductible, effective date and date of expiration of such policy. Such certificate shall also contain substantially the following statement: "The insurance covered by this certificate shall not be canceled, the coverage changed or reduced by endorsement, by the insurance company, except after thirty (30) calendar days written notice has been received by COUNTY." The A/E shall not cancel or materially alter this coverage without prior written approval by COUNTY. The A/E shall be responsible for consultants maintaining professional liability insurance during the life of their Agreement.

10. ARTICLE 10: OTHER INSURANCE

10.A. The A/E and its consultants retained under terms of this Agreement shall:

10.A.1) Maintain Worker's Compensation Insurance as required by Wisconsin State Statutes.

10.A.1) a. Procure and maintain Worker's Compensation Insurance as required by State of Wisconsin Statutes for all of the A/E's and consultant's employees engaged in work associated with the project under this Agreement.

10.A.1) b. Maintain Employer's Liability Insurance with a policy limit of not less than \$1,000,000 per occurrence and \$2,000,000 in the aggregate.

10.A.2) Procure and maintain during the life of this Agreement, and until one year after the completion of this Agreement, Commercial General Liability Insurance, including Products and Completed Operations for all claims that might occur in carrying out the Agreement. Minimum coverage shall be \$1,000,000 per occurrence, \$1,000,000 general aggregate, combined single limit for bodily injury, personal injury, and property damage. Such coverage shall be of the "occurrence" type form and shall include the employees of the A/E as insureds.

10.A.3) Procure and maintain Commercial Automobile Liability Insurance for all owned vehicles that are used in carrying out the Agreement. Minimum coverage shall be \$1,000,000 per occurrence combined single limit for bodily injury and property damage.

10.A.4) Provide an insurance certificate indicating the above Commercial Liability Insurance and property damage coverage, countersigned by an insurer licensed to do business in Wisconsin, covering and maintained for the period of the Agreement. Upon request by COUNTY, the insurance certificate is to be presented on or before execution of the Agreement.

11. ARTICLE 11: MISCELLANEOUS PROVISIONS

- 11.A. A/E warrants that it has complied with all necessary requirements to do business in the State of Wisconsin, that the persons executing this Agreement on its behalf are authorized to do so.
- 11.B. Legal Relations. The A/E shall comply with and observe federal and state laws and regulations and local zoning ordinances applicable to this project and in effect on the date of this Agreement.
- 11.C. Approvals or Inspections. None of the approvals or inspections performed by COUNTY shall be construed or implied to relieve the A/E from any duty or responsibility it has for its professional performance, unless COUNTY formally assumes such responsibility in writing from COUNTY so stating that the responsibility has been assumed.
- 11.D. Successors, Subrogees and Assigns. COUNTY and A/E each bind themselves, their partners, successors, subrogees, assigns, and legal representatives to the other party to this Agreement and to the partners, successors, subrogees, assigns and legal representatives of such other party with respect to covenants of this Agreement.
- 11.E. Claims. The A/E's project manager will meet with COUNTY's Project Manager to attempt to resolve claims, disputes and other matters in question arising out of, or relating to, this Agreement or the breach thereof. Issues not settled are to be presented in writing to the COUNTY Deputy Public Works Director for review and resolution. The decision of the Deputy Public Works Director shall be final. Work shall progress during the period of any dispute or claim. Unless specifically agreed between the parties, venue will be in Dane County, Wisconsin.
- 11.F. Amendment of Agreement. This Agreement may be amended in writing by both COUNTY and A/E.
- 11.G. It is expressly understood and agreed to by the parties hereto that in the event of any disagreement or controversy between the parties, Wisconsin law shall be controlling. Venue for any legal proceedings shall be in the Dane County Circuit Court.
- 11.H. This Agreement is intended to be an agreement solely between the parties hereto and for their benefit only. No part of this Agreement shall be construed to add to, supplement, amend, abridge or repeal existing duties, rights, benefits or privileges of any third party or parties, including but not limited to employees of either of the parties.
- 11.I. The entire agreement of the parties is contained herein and this Agreement supersedes any and all oral agreements and negotiations between the parties relating to the subject matter hereof. The parties expressly agree that this Agreement shall not be amended in any fashion except in writing, executed by both parties.

12. ARTICLE 12: NONDISCRIMINATION IN EMPLOYMENT

- 12.A. During the term of this Agreement, A/E agrees not to discriminate on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state defense force or any other reserve component of the military forces of the United States, or political beliefs against any person, whether a recipient of services (actual or potential) or an employee or applicant for employment. Such equal opportunity shall include but not be limited to the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation or level of service(s). A/E agrees to post in conspicuous places, available to all

employees, service recipients and applicants for employment and services, notices setting forth the provisions of this paragraph. The listing of prohibited bases for discrimination shall not be construed to amend in any fashion state or federal law setting forth additional bases, and exceptions shall be permitted only to the extent allowable in state or federal law.

12.B. Civil Rights Compliance:

12.B.1) If A/E has twenty (20) or more employees and receives \$20,000 in annual contracts with COUNTY, the A/E shall submit to COUNTY a current Civil Rights Compliance Plan (CRC) for Meeting Equal Opportunity Requirements under Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title VI and XVI of the Public Service Health Act, the Age Discrimination Act of 1975, the Omnibus Budget Reconciliation Act of 1981 and Americans with Disabilities Act (ADA) of 1990. A/E shall also file an Affirmative Action (AA) Plan with COUNTY in accordance with the requirements of Chapter 19 of the Dane County Code of Ordinances. A/E shall submit a copy of its discrimination complaint form with its CRC/AA Plan. The CRC/AA Plan must be submitted prior to the effective date of this Agreement and failure to do so by said date shall constitute grounds for immediate termination of this Agreement by COUNTY. If an approved plan has been received during the previous calendar year, a plan update is acceptable. The plan may cover a two-year period. If A/E has less than twenty (20) employees, but receives more than \$20,000 from the COUNTY in annual contracts, it may be required to submit a CRC Action Plan to correct any problems discovered as the result of a complaint investigation or other Civil Rights Compliance monitoring efforts set forth herein below. If A/E submits a CRC/AA Plan to a Department of Workforce Development Division or to a Department of Health and Family Services Division that covers the services purchased by COUNTY, a verification of acceptance by the State of A/E's Plan is sufficient.

12.B.2) A/E agrees to comply with the COUNTY's civil rights compliance policies and procedures. A/E agrees to comply with civil rights monitoring reviews performed by the COUNTY, including the examination of records and relevant files maintained by the A/E. A/E agrees to furnish all information and reports required by the COUNTY as they relate to affirmative action and non-discrimination. A/E further agrees to cooperate with COUNTY in developing, implementing, and monitoring corrective action plans that result from any reviews.

12.B.3) A/E shall post the Equal Opportunity Policy, the name of A/E's designated Equal Opportunity Coordinator and the discrimination complaint process in conspicuous places available to applicants and clients of services, applicants for employment and employees. The complaint process will be according to COUNTY's policies and procedures and made available in languages and formats understandable to applicants, clients and employees. A/E shall supply to COUNTY's Contract Compliance Officer upon request a summary document of all client complaints related to perceived discrimination in service delivery. These documents shall include names of the involved persons, nature of the complaints, and a description of any attempts made to achieve complaint resolution.

ATTACHMENT A

ARCHITECTURAL / ENGINEERING PROFESSIONAL SERVICES AGREEMENT

AGREEMENT ON CONSTRUCTION PHASE SITE VISITS

Project No.: 318067

Agreement No.: [No.]

Project Name: Lussier Heritage Center & Lake Farm County Park Photovoltaic Installations Design

Construction phase services, for the Project referenced above, shall be provided by either the A/E or its Consultants as follows and in compliance with Article 2.G.:

1. The A/E shall visit the site a minimum of [] times during the construction phase (or [] times per month or [] times per week) and attend the pre-construction meeting, [weekly, bi-weekly, monthly] progress meetings and final inspection to determine if work has been completed according to plans and specifications. Site visits shall be conducted at essential times during the construction phase. To be considered a site visit, close-up observation of the current building elements in process of being constructed must be performed. Additional site visits necessitated by A/E error, omission, unauthorized changes or negligence, shall be accomplished without additional cost to COUNTY. Additional site visits necessitated by significant failure on the part of the lead or other prime construction contractors to perform, will be given consideration as additional services, reimbursable by the responsible construction contractor(s) through COUNTY. Where specialty work is performed "in-house" or by an outside Consultant, the minimum number of separate site visits by that specialist shall be as indicated below.
2. The Structural Consultant shall visit the site a minimum of [] times during the construction phase (or [] times per month).
3. The Mechanical Consultant shall visit the site a minimum of [] times during the construction phase (or [] times per month).
4. The Plumbing Consultant shall visit the site a minimum of [] times during the construction phase (or [] times per month).
5. The Electrical Consultant shall visit the site a minimum of [] times during the construction phase (or [] times per month).
6. The [] Consultant shall visit the site a minimum of [] times during the construction phase (or [] times per month).

ATTACHMENT B
ARCHITECTURAL / ENGINEERING PROFESSIONAL SERVICES AGREEMENT
A/E PROPOSAL

Follows on subsequent page(s)

SAMPLE

DRAFT

Dane County
Lussier Heritage Center and Lake Farm Camp Ground
Solar PV System
Sizing, Costing and Feasibility Study

For
Dane County WI

Completed by: Niels Wolter
Madison Solar Consulting

September 17, 2018

Disclaimer

The information presented here provides a feasibility study level overview of solar PV project and related technology siting, sizing, generation, electricity use offset, pricing and project economics. It should not be used as the only source of information.

While Madison Solar Consulting/Niels Wolter LLC strives to provide the best information possible, we make no representations or warranties, either express or implied, concerning the accuracy, completeness, reliability or suitability of the information. Niels Wolter LLC disclaims all liability of any kind arising out of your use or misuse of the information contained in this document.

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Summary

	Lussier Heritage Center	Lake Farm Park Campground ¹
Recommended System Size	77.5 kW dc ~67 kW ac Net metering	65 kW dc ~56 kW ac Net metering (for PV showers add 6.2 kW dc)
Offsetting	90% of site electricity use	
Installed Cost	Ground Mounted ² : \$155,000 Parking Canopy: \$170,500	\$130,000
Cost after 15% Focus on Energy Grant	Ground Mounted: \$131,750 Parking Canopy: \$145,000	\$110,500
Years to cost recovery	Ground Mounted: 15 Parking Canopy: 17	14
30 Year Internal Rate of Return	Ground Mounted: 6.6% Parking Canopy: 5.4%	7.3%
30 Year Net Present Value	Ground Mounted: \$17,400 Parking Canopy: -\$560	\$23,900
Tons CO2 reduced in year one	Ground Mounted: 75 Parking Canopy: 74	67

¹ Siting Option 2

² Siting Option 4

Other Project Options, Preliminary Analysis

	PV Monitoring System	Battery Backup System	PV Powered Electric Car Charging	PV Powered Electric Bicycle Charging	PV Heated Campground Showers
Description	Monitoring of PV generation and site power use with physical monitors	Battery system able to provide three hours of back up power to Lussier Center	One 50 kW DC Fast Charger (DCFC) used four hours per day	Four plugs used to charge eight bicycles per day	54 three minute showers per day 199 days/year using low flow shower heads
Estimated Cost	\$2,100 to \$2,600/ site	\$20,600	DCFC: \$50,000, + utility upgrade costs + \$3000/year maintenance PV System: \$102,000 Total: \$157,000 + annual maintenance + upgrade	\$5,000	Two electric hot water heaters: \$11,000 6.2 kW dc PV System: \$10,540 Total: \$21,540
Annual benefits	NA	Not monetized	If 15.6 cent/kWh charged and maintenance fee, \$8,400/year	NA	Reduced LP costs of \$500/year
Estimated life	20 years	10 years	DCFC: 15 Years	20 years	Hot water heater: 10

			PV System: 30 years		years PV System: 30 years
Simple Payback period	NA	NA	19 years (not including electric service upgrade)	NA	44 years
Other	Educational benefits	Power outage benefits	Annual charging of 300,000 car miles/year	Annual charging of 30,000 to 60,000 bike miles/year	10,750 PV heated showers per year

Key Data, Calculations and Assumptions

Site Electricity Use

Source: Bills provided by County staff

Lussier Heritage Center

Bills Date	2016 kWh	2017 kWh	2018 kWh	Average kWh
January		8,503	8,368	8,436
February		8,214	7,517	7,866
March		7,815	7,015	7,415
April		7,721	7,093	7,407
May		7,507	8,500	8,004
June	9,178	8,502	8,878	8,853
July		8,522	9,985	9,254
August	11,095	9,232		10,164
September	8,217	7,954		8,086
October	7,440	7,356		7,398
November	7,544	7,832		7,688
December	8,968	7,578		8,273
Total		96,736		98,841

Lake Farm Park Campground

Electric Use	2016 kWh	2017 kWh	2018 kWh	Average kWh
January		613	297	455
February		583	257	420
March		513	644	579
April		1,781	1,566	1,674
May		11,634	11,890	11,762
June	13,393	16,704	14,624	14,907
July		15,413	19,531	17,472
August	17,042	15,851		16,447
September	13,140	12,287		12,714

October	11,269	13,433	12,351
November	5,967	5,332	5,650
December	754	207	481
Total		94,351	94,909

MGE Electric Rates

Both sites are on MGE's commercial and industrial time of use, CG4A, three phase electric rate

CG4A Usage (kWh) Charges

Off peak electricity use (\$ per kWh)	Business day electricity use 1 pm to 6 pm (\$ per kWh)	Business day electricity use 10 am to 1 pm, and 6 pm to 9 pm (\$ per kWh)
	Summer Winter	Summer Winter
\$0.05215	\$0.11363 \$0.09832	\$0.10734 \$0.09832

CG4A Demand (kW) Charges

Annual	\$/Day kW		\$/month kW
	0.0848		\$2.5811
Monthly	Summer \$/Day kW	Winter \$/Day kW	Weighted average monthly \$/kW
	0.423	0.3453	\$11.2979

CG4A Fixed Charge: \$192.38/month per meter

Madison Gas and Electric (MGE) - Distributed Generation Rates

PG-1 Distributed Generation

Used when the PV system is larger than 100 kW ac or it generates more kWhs in any year than the site uses

- Surplus generation purchased at:
 - Off peak electricity use: \$0.028/kWh
 - Business day electricity use 10 am to 9 pm: \$0.03847/kWh
- Customer charge: \$9.80/month

PG-2 Net Metering

- Used with PV systems of under 100 kW ac, when solar generation is less than the site's annual power use.
- Solar generation valued at the sites retail rate (see the CG4A usage rates above)

If the site is a net solar generator over a year:

- The account is bumped out of the PG-2 net metering rate, and into the PG-1 rate, Which values solar generation at its wholesale value and includes the monthly customer charge
- Thus, PV systems should be slightly under sized

PV System Rating

- kW dc, kilowatt direct current, the rating of the PV modules
 - This is usually what is referred to as the systems size
- kW ac, kilowatt alternating current, the rating of the PV inverters
 - This is what matters to the electric utility, and for net metering

This analysis assumes a kW dc/ kW ac ratio of 1.15

Value of Solar Energy Produced

\$0.08684 cents/kWh

- Based on
 - MGE's CG-4A rate structure
 - Hourly solar resource analysis for Madison Wisconsin for a PV system facing S45°W and a slope of 25° from the horizontal (determined using PVWatts)

PV System Losses

Obstacle Shading

Image below, Lussier Heritage Center Showing Potential PV Sites (in blue) and Shade Throwing Areas 1 – 6 (in yellow)



Estimated tree heights

Areas 1, 3 and 6: 40 feet

Areas 2 and 5: 20 feet

Area 4: 50 feet

Lake Farm Park Camp Ground: no shading losses

Monthly Losses Caused by PV Module Soiling and Snow Cover

	Ground Mounted Array	Roof Mounted Array
April to October	2% losses	
November and March	10% losses	15% losses
December and February	25% losses	35% losses
January	30% losses	40% losses

PV System Technical Losses: determine by Helioscope

PV System Components Used in Modeling

- Modules: Canadian Solar 345 watts (345 watts dc)
- Inverters: SMA SunnyBoy TriPower 24 kilowatts (24 kW ac)

PV System Modeling: used Helioscope

PV Array Mounting Options

Ground Mounted



Ground Mounted Rows



Back Side of a Ground Mounted Array. Inverters will be mounted at the array.



Parking Canopy



Sloping Roof Mounted



PV Array Mounting Options and Power Generation

Lussier Heritage Center

Siting Option 1: Building and Oak Ground Mounted Arrays



Array Sizes, and Specs

Near Lussier Center: 34.5 kW dc, facing S40°W 25° tilt

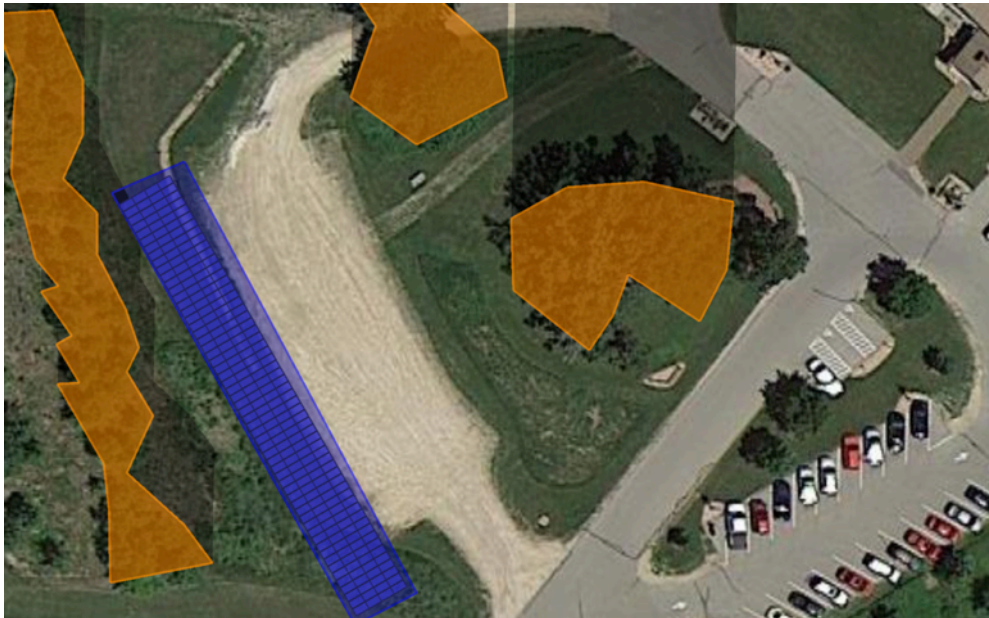
Oak Tree Array: 48.3 kW dc, facing S60°W 25° tilt

Size	82.8 kW dc		
	Site Use kWh	Solar kWh	Difference kWh
January	8,436	3,727	4,708
February	7,866	4,984	2,881
March	7,415	7,526	(111)
April	7,407	9,976	(2,569)
May	8,004	11,747	(3,744)
June	8,853	12,149	(3,296)
July	9,254	12,163	(2,910)

August	10,164	11,144	(981)
September	8,086	8,727	(641)
October	7,398	6,418	980
November	7,688	3,935	3,753
December	8,273	3,270	5,004
Total	98,841	95,765	3,075
	Solar share	97%	

	Solar Share of Load			
System Size	100%	90%	85%	80%
kW dc	85	77	73	68

Siting Option 2: Parking Lot Ground Mounted Array
 Will need to manage the trees southwest of the array

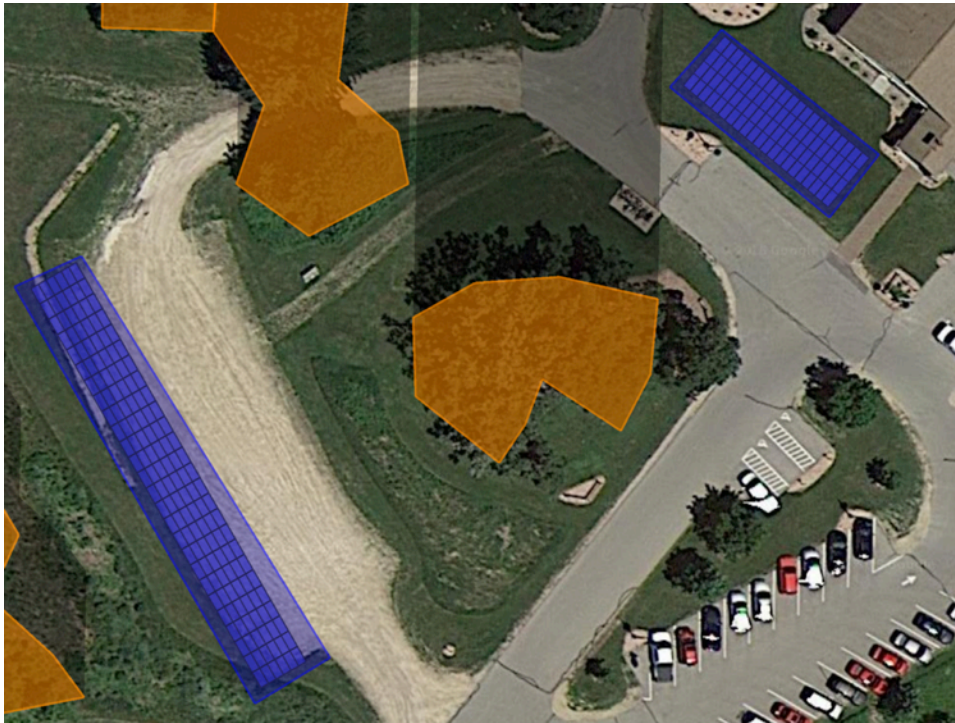


Size	80 kW dc		
	facing S60°W 25° tilt		
	Site Use kWh	Solar kWh	Difference kWh
January	8,436	3,389	5,047

February	7,866	4,568	3,298
March	7,415	7,060	355
April	7,407	9,323	(1,916)
May	8,004	11,242	(3,238)
June	8,853	11,785	(2,933)
July	9,254	11,659	(2,405)
August	10,164	10,579	(415)
September	8,086	7,954	131
October	7,398	5,870	1,528
November	7,688	3,599	4,089
December	8,273	2,958	5,315
	98,841	89,986	8,855
	Solar share	91%	

	Solar Share of Load			
System Size	100%	90%	85%	80%
kW dc	88	79	75	70

Siting Option 3: Building Ground Mounted and Parking Canopy Arrays
 Will need to manage the trees southwest of the canopy array



Array Sizes

Near Lussier Center: 28.98 kW dc, facing S40°W 25° tilt

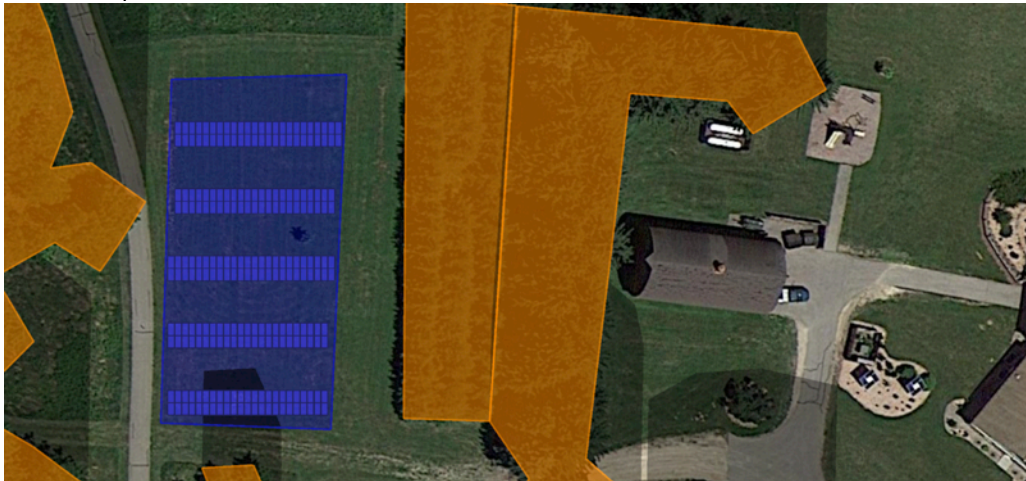
Parking Canopy: 53.82 kW dc, facing S60°W 25° tilt

Size	82.8 kW dc		
	Site Use kWh	Solar kWh	Difference kWh
January	8,436	3,672	4,763
February	7,866	4,907	2,959
March	7,415	7,843	(428)
April	7,407	10,408	(3,001)
May	8,004	12,484	(4,481)
June	8,853	13,045	(4,193)
July	9,254	12,904	(3,650)
August	10,164	11,691	(1,527)
September	8,086	8,930	(845)
October	7,398	6,401	997

November	7,688	3,837	3,851
December	8,273	3,171	5,102
	98,841	89,986	8,855
Solar share		91%	

	Solar Share of Load			
System Size	100%	90%	85%	80%
kW dc	91	82	77	73

Siting Option 4: Field Row Array



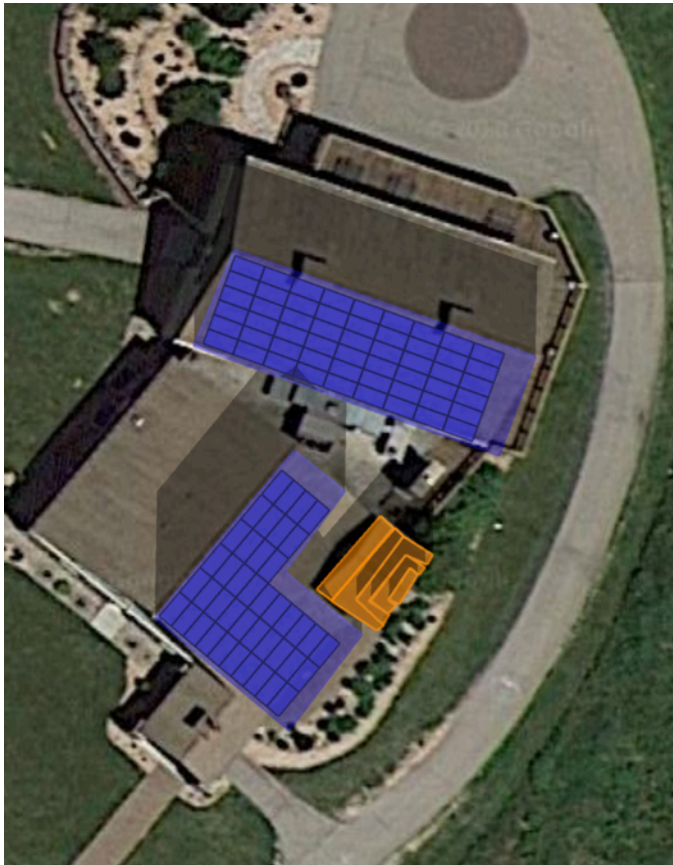
Size	80.7 kW dc		
	Facing due south, 25° tilt with 20 foot row spacing		
	Site Use kWh	Solar kWh	Difference kWh
January	8,436	4,187	4,248
February	7,866	5,211	2,654
March	7,415	8,173	(758)
April	7,407	9,981	(2,574)
May	8,004	11,844	(3,840)
June	8,853	12,231	(3,378)
July	9,254	12,052	(2,799)

August	10,164	11,260	(1,096)
September	8,086	8,952	(867)
October	7,398	6,916	482
November	7,688	4,286	3,402
December	8,273	3,529	4,744
	98,841	98,622	219
Solar share		100%	

	Solar Share of Load			
System Size	100%	90%	85%	80%
kW dc	81	73	69	65

Siting Option 5: Roof Arrays

How much could be sited on the roof of the Lussier Center?



Array Sizes

Meeting room roof: 18.6 kW dc, facing S20°W 13° tilt

Administrative building roof : 14.5 kW dc, facing S50°E 13° tilt

PV Array Siting Options: Lake Farm Camp Ground

Size	33.1 kW dc		
	Site Use kWh	Solar kWh	Difference kWh
January	8,436	1,273	7,162
February	7,866	1,651	6,215
March	7,415	2,916	4,500
April	7,407	3,838	3,570
May	8,004	4,603	3,401
June	8,853	4,791	4,061
July	9,254	4,719	4,534
August	10,164	4,269	5,894
September	8,086	3,336	4,749
October	7,398	2,535	4,863
November	7,688	1,444	6,244
December	8,273	1,086	7,187
	98,841	36,461	62,380
	Solar share	37%	

Lake Farm Camp Ground

Siting Option 1: Two-Row Array. Note that the image does not show the paved bike path.



Size	72.5 kW dc		
	Facing S38°W 25° tilt		
	Site Use kWh	Solar kWh	Difference kWh
January	455	3,933	(3,478)
February	420	5,069	(4,649)
March	579	7,407	(6,829)
April	1,674	9,518	(7,845)
May	11,762	11,182	580
June	14,907	11,551	3,356
July	17,472	11,519	5,953
August	16,447	10,596	5,850
September	12,714	8,501	4,213
October	12,351	6,637	5,715
November	5,650	4,257	1,393
December	481	3,483	(3,002)
	94,909	93,652	1,257

Solar share	99%
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	Solar Share of Load			
System Size	100%	90%	85%	80%
kW dc	73	66	62	59

Siting Option 2: One Row Array



Long Single Row			
Size	72.5 kW dc		
Facing S40°W and S35°W 25° tilt			
	Site Use kWh	Solar kWh	Difference kWh
January	455	3,990	(3,535)
February	420	5,139	(4,719)
March	579	7,488	(6,909)
April	1,674	9,604	(7,930)
May	11,762	11,278	484
June	14,907	11,642	3,265
July	17,472	11,614	5,858
August	16,447	10,691	5,756

September	12,714	8,576	4,137
October	12,351	6,743	5,608
November	5,650	4,341	1,309
December	481	3,564	(3,084)
	94,909	94,669	240
	Solar share	100%	

	Solar Share of Load			
System Size	100%	90%	85%	80%
kW dc	73	65	62	58

Siting Option 3: Ground Mounted Array



Large Ground Array			
Size	70.4 kW dc		
Facing S40°W 25° tilt			
	Site Use kWh	Solar kWh	Difference kWh
January	455	3,843	(3,388)
February	420	4,973	(4,553)
March	579	7,234	(6,655)

April	1,674	9,317	(7,644)
May	11,762	10,946	816
June	14,907	11,310	3,597
July	17,472	11,282	6,190
August	16,447	10,364	6,083
September	12,714	8,290	4,424
October	12,351	6,500	5,851
November	5,650	4,185	1,465
December	481	3,439	(2,958)
	94,909	91,681	3,228
	Solar share	97%	

	Solar Share of Load			
System Size	100%	90%	85%	80%
kW dc	73	66	62	58

Siting a PV Array on the Extended Roof of the Shower Building

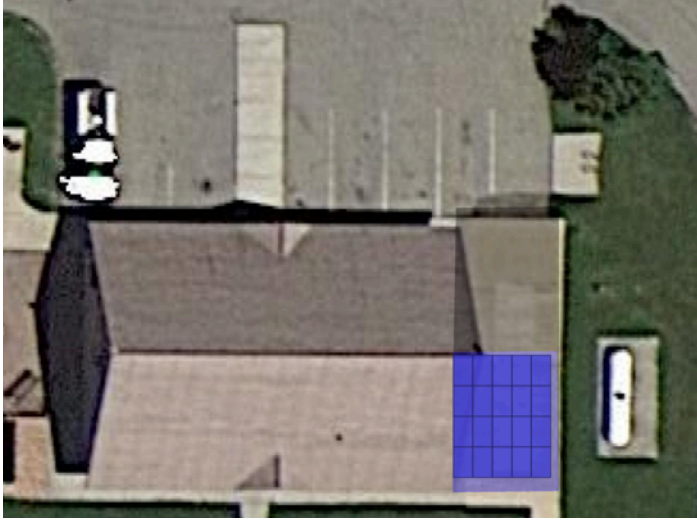
Orientation: facing due south, 18° tilt

Modules: Canadian Solar 250 watt

Size: 5 kW dc

Generating: 6,0470 kWh/year

"Efficiency": 1209 kWh/kW dc



Financial Analysis: Assumptions

	Lussier Heritage Center	LFP Campground
System Size (kW dc)	Options 1 – 4: 77.5 kW dc Option 5: 30 kW dc	65
Base System Installed Cost (\$/kW)	\$2,000	\$2,000
Added Cost for Parking Canopy (\$/kW)	\$200	NA
Reduced Cost for Roof Mounted (\$/kW)	\$200	NA
Electricity generation kWh per kW dc	Option 1: 1,155 Option 2: 1,125 Option 3: 1,200 Option 4: 1,220 Option 5: 1,102	Option 1: 1,290 Option 2: 1,310 Option 3: 1,300
Annual output degradation	0.5%	
Focus on Energy Grant	15% of system installed cost	
Value of kWh Savings	8.684 cents/kWh	
Value of Demand Savings		
Annual demand charge reduction	5% of the PV systems rated DC capacity	
Monthly demand charge reduction	10% of the PV systems rated DC capacity	
Energy Cost Escalation Rate over next 25 years	2%/year	
Insurance	0.35% of system cost	
Maintenance and Replacements	0.35% of system cost	
Inverter replacement costs		
Year 20	0.6% of system cost	
Year 25	0.3% of system cost	
Escalation rate for insurance, operation and replacements	3%/year	
MGE CO ₂ Emissions per	1.587 lbs. CO ₂ /kWh	

kWh of conventional power	Source: MGE 2016 Environmental and Sustainability Report
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Comments on PV system price estimates

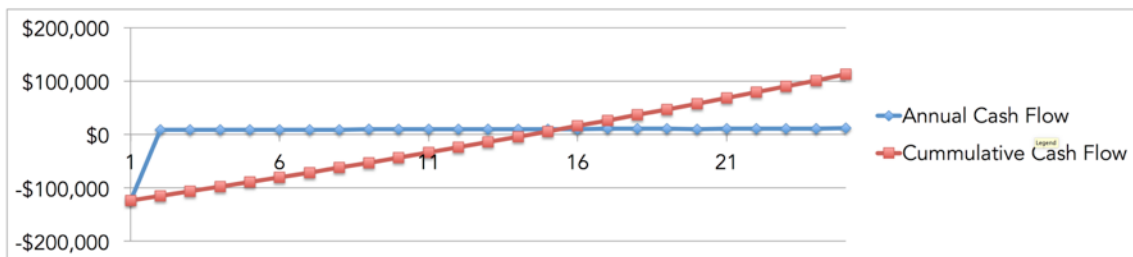
- Prices shown are a bit higher than seen in bids over the last year. Prices should be a bit lower (given the current PV module pricing). But it seems that Dane County gets high bids.
 - Recommend getting bids from local installers as well as: Convergence Energy (often team with Arch Electric), Eagle Point Solar and SunVest (often team with Current Electric)
- Price does not include
 - Unexpected interconnection costs
 - Unexpected cost to run conduit
 - Other unexpected costs

Financial Analysis: Results

Lussier Center

Siting Option	1	2	3	4	5
PV Size (kW dc)	77.5				30
First Cost	\$155,000		\$170,500	\$155,000	\$54,000
Focus Incentive	\$23,250		\$25,575	\$23,250	\$8,100
Cost after Focus Incentive	\$131,750		\$144,925	\$131,750	\$45,900
Years to Cost Recovery	16	16	17	15	15
20 year IRR	3.3%	3.0%	2.5%	4.0%	4.2%
30 year IRR	6.1%	5.8%	5.4%	6.6%	6.8%
20 year NPV	-\$22,238	-\$25,086	-\$32,876	-\$16,068	-\$4,784
30 year NPV	\$9,433	\$5,746	-\$562	\$17,423	\$7,140
Tons CO ₂ reduced in year one	71	69.2	73.8	75	26.2

Siting Option 4, Cash Flow Diagram



Siting Option 4, Annual Cash Flows Year 1 to 20

Year	1	2	3	4	5	6	7
System Cost	\$(155,000)						
Grants	\$23,250						
kWh Savings	\$8,211	\$8,333	\$8,457	\$8,583	\$8,711	\$8,841	\$8,973
Demand Savings	\$1,171	\$1,194	\$1,218	\$1,243	\$1,267	\$1,293	\$1,319
Maintenance and Insurance Cost	\$(1,085)	\$(1,101)	\$(1,134)	\$(1,157)	\$(1,192)	\$(1,227)	\$(1,264)

Annual Cash Flow	\$(123,453)	\$8,426	\$8,541	\$8,669	\$8,787	\$8,906	\$9,027
Cumulative Cash Flow	\$(123,453)	\$(115,027)	\$(106,486)	\$(97,817)	\$(89,031)	\$(80,124)	\$(71,098)

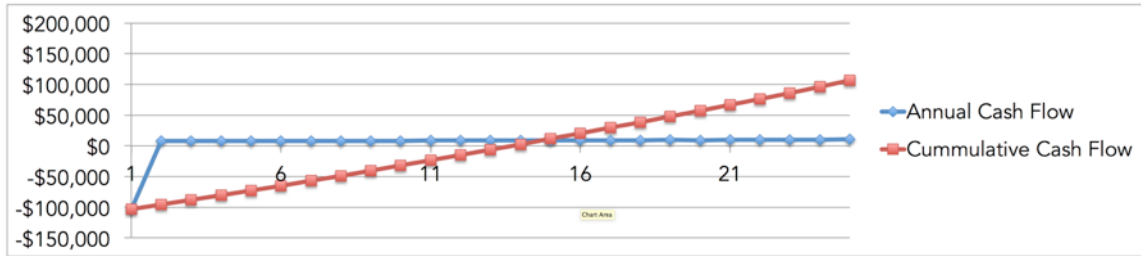
Year	8	9	10	11	12	13	14
kWh Savings	\$9,106	\$9,242	\$9,380	\$9,519	\$9,661	\$9,805	\$9,951
Demand Savings	\$1,345	\$1,372	\$1,399	\$1,427	\$1,456	\$1,485	\$1,515
Maintenance and Insurance Cost	\$(1,302)	\$(1,341)	\$(1,382)	\$(1,423)	\$(1,466)	\$(1,510)	\$(1,555)
Annual Cash Flow	\$9,149	\$9,273	\$9,398	\$9,524	\$9,652	\$9,781	\$9,911
Cumulative Cash Flow	\$(61,948)	\$(52,676)	\$(43,278)	\$(33,754)	\$(24,103)	\$(14,322)	\$(4,411)

Year	15	16	17	18	19	20
kWh Savings	\$10,100	\$10,250	\$10,403	\$10,558	\$10,715	\$10,875
Demand Savings	\$1,545	\$1,576	\$1,607	\$1,640	\$1,672	\$1,706
Maintenance and Insurance Cost	\$(1,602)	\$(1,650)	\$(1,699)	\$(1,750)	\$(1,803)	\$(1,857)
Inverter replacement						\$(930)
Annual Cash Flow	\$10,043	\$10,176	\$10,311	\$10,447	\$10,585	\$9,794
Cumulative Cash Flow	\$5,632	\$15,808	\$26,119	\$36,567	\$47,152	\$56,945

Lake Farm Park Camp Ground

Siting Option	1	2	3
PV Size (kW dc)	65		
First Cost	\$130,000		
Focus Incentive	\$19,500		
Cost after Focus Incentive	\$110,500		
Years to Cost Recovery	14		
20 year IRR	4.6%	4.8%	4.7%
30 year IRR	7.1%	7.3%	7.2%
20 year NPV	-\$7,903	-\$6,311	-\$7,107
30 year NPV	\$21,829	\$23,891	\$22,860
Tons CO ₂ reduced in year one	66.5	67.6	67.1

Siting Option 1, Cash Flow Diagram



Siting Option 1, Annual Cash Flows Year 1 to 20

Year	1	2	3	4	5	6	7
System Cost	\$(130,000)						
Grants	\$19,500						
kWh Savings	\$7,282	\$7,390	\$7,500	\$7,612	\$7,725	\$7,840	\$7,957
Demand Savings	\$982	\$1,002	\$1,022	\$1,042	\$1,063	\$1,084	\$1,106
Maintenance and Insurance Cost	\$(910)	\$(924)	\$(951)	\$(970)	\$(999)	\$(1,029)	\$(1,060)
Annual Cash Flow	\$(103,146)	\$7,468	\$7,570	\$7,684	\$7,789	\$7,895	\$8,003
Cumulative Cash Flow	\$(103,146)	\$(95,678)	\$(88,108)	\$(80,424)	\$(72,636)	\$(64,740)	\$(56,738)

Year	8	9	10	11	12	13	14
kWh Savings	\$8,076	\$8,196	\$8,318	\$8,442	\$8,568	\$8,696	\$8,825
Demand Savings	\$1,128	\$1,151	\$1,174	\$1,197	\$1,221	\$1,245	\$1,270
Maintenance and Insurance Cost	\$(1,092)	\$(1,125)	\$(1,159)	\$(1,193)	\$(1,229)	\$(1,266)	\$(1,304)
Annual Cash Flow	\$8,112	\$8,222	\$8,333	\$8,446	\$8,560	\$8,675	\$8,791
Cumulative Cash Flow	\$(48,626)	\$(40,404)	\$(32,071)	\$(23,625)	\$(15,065)	\$(6,390)	\$2,401

Year	15	16	17	18	19	20
kWh Savings	\$8,957	\$9,090	\$9,226	\$9,363	\$9,503	\$9,644
Demand Savings	\$1,296	\$1,322	\$1,348	\$1,375	\$1,403	\$1,431
Maintenance and Insurance Cost	\$(1,343)	\$(1,384)	\$(1,425)	\$(1,468)	\$(1,512)	\$(1,557)
Inverter replacement						\$(780)
Annual Cash Flow	\$8,909	\$9,028	\$9,149	\$9,270	\$9,393	\$8,738
Cumulative Cash Flow	\$11,310	\$20,339	\$29,487	\$38,758	\$48,151	\$56,888

Summary of Other Project Options, Costs and Benefits

Flat Screen Energy Monitoring and Web-Based Monitoring

Several firms offer PV energy metering and monitoring systems. Shown below is the example of the EGauge Monitoring System.

The recommended system includes:

1. Monitoring of the PV system's real time output and environmental impacts
The components include: current transducers, and the energy monitoring system. The energy monitoring system needs to be connected to the Internet via powerline communication or an Ethernet connection. The monitoring system can be set up to send real time alerts when issues arise to the maintenance provider (and anyone else).

Image below, EGauge's Screen showing PV system output over three days (from the Darlington School District, Darlington WI).

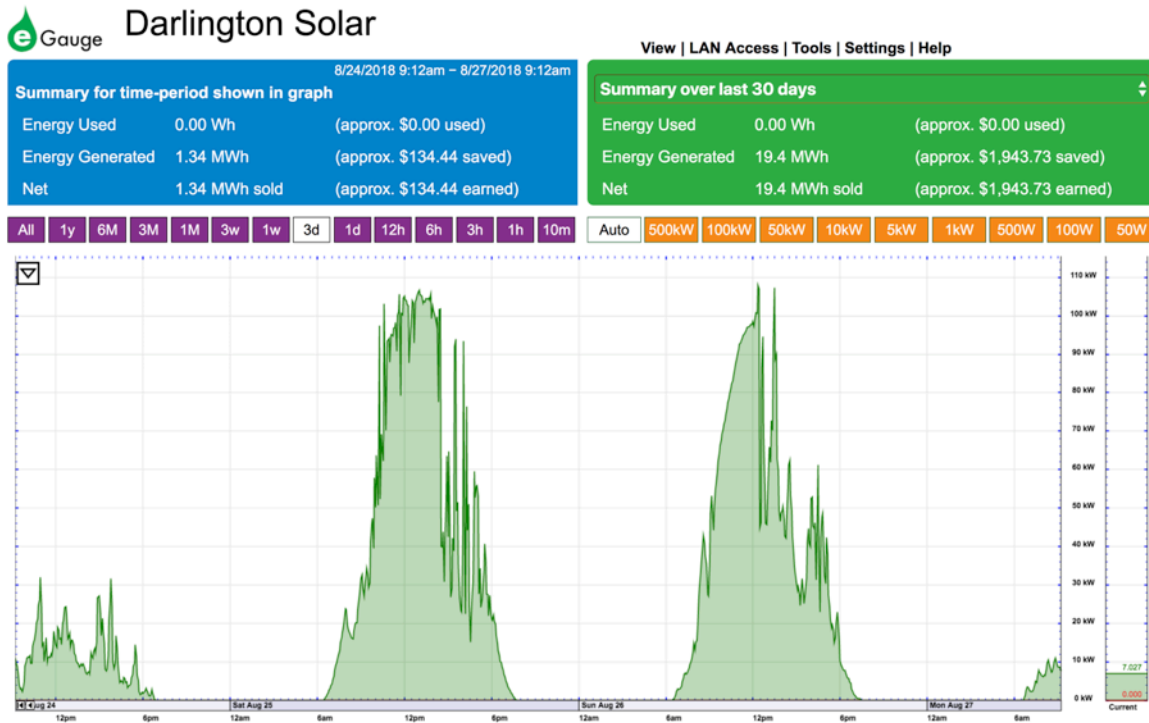
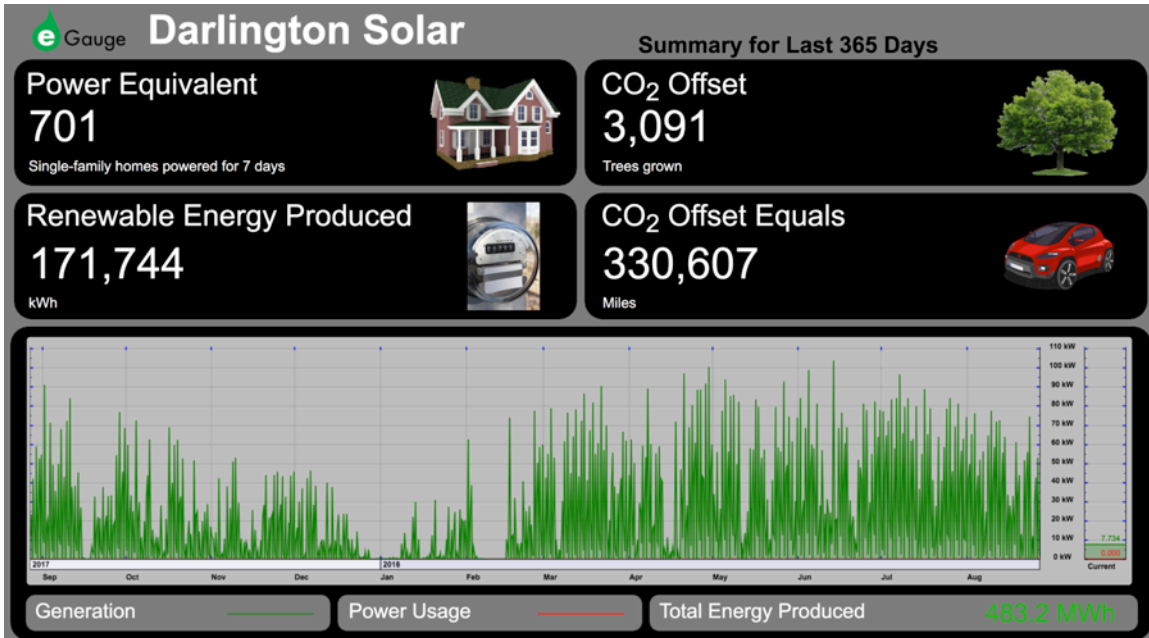


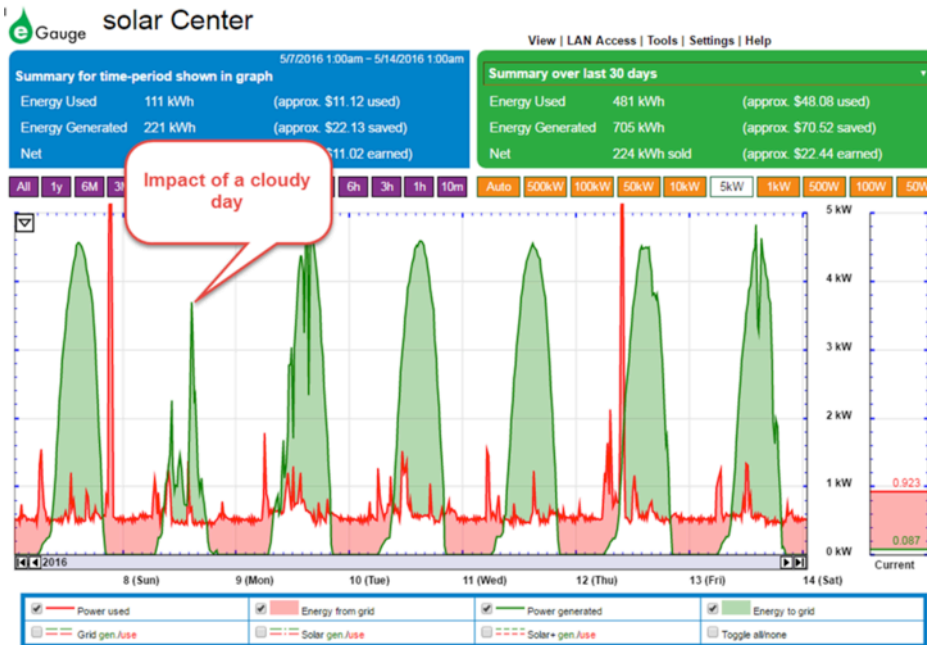
Image below, EGauge's Screen showing PV system benefits and power generation over the previous year (from the Darlington School District, Darlington WI).



2. Monitoring of the building's real time power use

Image below, EGauge's screen showing both a building's power use and the site's solar power generation.

Image source: vmPete.com



3. Wireless connection to the web, which allows the County to show the PV system’s solar energy, the buildings power use (if desired) and the environmental impacts of the solar generation on County websites.
4. A flat screen monitor, would be wall mounted and used to show the PV system’s current status, using one or cycling through different EGauge screen options. Could be sited anywhere, at the site or otherwise.

Image source: Amazon.com



Most of the PV inverter manufacturers also support web-based and flat screen monitoring of the PV system’s output and the environmental impacts. These systems typically do not include monitoring of the building’s power use.

Monitoring System Cost per Site
Example EGauge System

Component	
Power and Energy Meter	\$500 to \$850
4 to 6 Current transducers	\$150 to \$300
Flat Screen Monitor	\$250
Other components and shipping	\$200
Labor	\$1000
Estimated Monitoring System Cost	\$2,100 to \$2,600

Recommendation

- The monitoring system should be specified and included in the bid for the PV systems.

Battery Backup System

Because both site's PV systems can net meter with MGE, there is no real need for a battery back up. With net metering, the MGE grid acts like a 100% efficient battery.

However, if the County would like to demonstrate/test a battery system or provide power while the grid is down, a battery system could be installed.

For example, if the batteries were to provide three hours of back up power, without added solar power, to the Lussier Heritage Center, battery size and cost can be determined as follows:

Lussier Center's annual power use	96,736 kWh/year	Data Provided by Dane County Staff
Daily power use	265 kWh/day	Calculated
Three hour power use:	33 kWh	Calculated
Storage per Tesla PowerWall	13.5 kWh	Tesla
Three power walls	40.5 kWh of storage	Calculated
Price of three PowerWalls		
PowerWalls	\$17,700	Tesla
Supporting hardware	\$700	Tesla
Installation	~\$2000	Tesla estimates \$1000 to \$3000
Shipping and other fees	\$200	Estimated
Total	\$20,600	Calculated

Other battery systems may cost less. Example: Pika Energy's Harbor Battery (with 17.1 kWh of storage/battery).

Benefits: difficult to monetize

Technology Life Estimates:

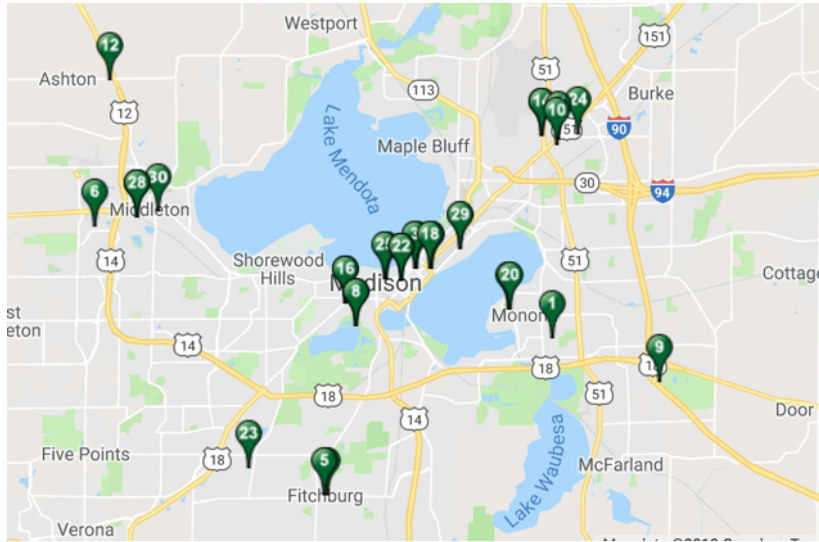
- Tesla battery pack: 10 years
- PV system: 30 years

Recommendations:

- Does not make financial sense to install batteries at either site, unless the monetary benefit of providing back up power is very large.
- If the decision is made to go forward, further specify the desired battery options, and add it as a pricing option in the PV systems' RFP

Electric Vehicle Charging

MGE provides a map showing 30 car-charging stations (image below) around Madison³. Many are MGE owned. MGE uses Charge Point utility-grade charging systems.



One option is to have MGE own the car charging station at the Lussier Center. Note that charge station 1, is close to Lake Farm Park. That charge station includes both a Level 1 and Level 2 chargers. MGE may also be able to help determine if it makes sense to locate car charging at Lake Farm.

Table, Types of Car Chargers. Two types are considered for the Heritage Center: Level 2 Charger and DC Fast Charger (DCFC).

Type of Charger	Voltage	Current (Amps)	Power (kW) or kWh/hour	Miles of Charging per Hour ⁴	Time to charge 20 kWh battery
Level 1	120	16	1.92	7.7	10 hours
Level 2	240	30	7.2	29	2.8 hours
DCFC	480	100	50 ⁵	200	24 minutes

³ Mr. Dave Toso at MGE supports this effort.

⁴ Assuming electric cars travel 4 miles per kWh of charge. This is a standard industry assumption.

⁵ Also available in other sizes, such as 150 kW.

Often car-charging stations have more than one charge point and may have more than one charger type. Common car charging station options are summarized below (information provided by Keith Reopelle).

Charger Options	Required Electrical Service	“Future Proofed” Turnkey Installed Price	Annual Maintenance Contract
One 50 kW DCFC charger + Two Level 2 chargers	100 Amp 480 Volt 3-Phase	\$70,000 to \$90,000	\$3,000 to \$6,000
One 150 kW DCFC charger + Two Level 2 chargers	300 Amp 480 Volt 3-Phase	\$150,000 to \$170,000	
Two 150 kW DCFC chargers + Two Level 2 chargers	400 Amp 480 Volt 3-Phase	\$275,000 to \$300,000	

The site must have the correct electric infrastructure to support the loads of the car chargers. The electrical service at:

- Lussier Heritage Center: 600 amp 120-208V 3 phase
- Lake Farm Park Campground: 800 amp 120-208V 3 phase

A Level 1 charging station could be installed at the Lussier Center or the Campground, with out a service upgrade, if there is room for the breaker on the site’s electric panel.

For Level 2 or DCFC car chargers to be installed, at either site, the electrical service would need to be upgraded to 480 Volts and the electrical panel would probably also need to be upgraded.

One 50 kW DCFC at the Heritage Center

One 50 kW DCFC is expected to cost \$40,000 to \$60,000 plus the cost of the Heritage Center’s service and electric panel upgrades.

Electric Car Charging Estimated Electricity Needs

Assumptions	Source
Plugs 1	Assumed
DCFA Watts per plug 50 Watts	Assumed, normal

Hours charging per day	4 hours	for DCFC station Assumed
Electric use per day	200 kWh	Calculated
Electricity use per year	73,000 kWh	Calculated
PV efficiency	1200 kWh/kW dc	Helioscope Analysis for Heritage Center
PV system size	60 kW dc	Calculated
Electric car miles per kWh	4 miles	Industry standard assumption
Electric car miles/year	300,000	Calculated

Electric Car Charging Economics

Cost Estimates:

- Final Cost of PV System: \$102,000
 - Installed cost PV System: 60 kW dc * \$2,000/kW dc = \$120,000
 - Focus on Energy incentive: \$120,000 * 15% = \$18,000
- 50 kW DCFC charging station: \$50,000 + \$3,000/year (for maintenance)
- Total cost estimate: \$157,000 + \$3,000/year

Income from Car Charging

- Charging cars pay 13 cents/kWh plus 20% fee: 15.6 cents/kWh
- Annual charging income: 15.6 cents/kWh * 73,000 kWh = \$11,400
- Charging income less annual \$3,000 maintenance fee: \$8,400

Simple Payback Period⁶:

- Charging station only: 6 years
- Charging station with PV: 19 years

Technology Life Estimates:

- Vehicle charging station: 15 years⁷
- PV system: 30 years

⁶ Does not include the Heritage Center's electric service upgrade cost.

⁷ Some analysts assume 10 years.

Recommendations

- Further consider the car charging options with input from MGE
- Further evaluate the site's electric upgrade costs
- If the decision is made to go forward, specify the desired charging station, and add the car charging station as a pricing option in the PV systems' RFP

Electric Bicycle Charging

Plugs for charging bicycle should be easy to add at either site. Their load is relatively small thus it is unlikely that any electric service upgrades are needed.

Electric Bicycle Charging Estimated Electricity Needs

Assumptions		Source
Plugs	4	Estimated
Bikes plugged-in per plug per day	2	Estimated
Full charge per plug-in	0.5 kWh	Cynergyebikes.com
Percent charge per plug-in	50%	Estimated
Electric use per day	2.0 kWh	Calculated
Electricity use per year	730 kWh	Calculated
PV efficiency	1300 dc	Helioscope Analysis for Campground
PV system size	0.56 kW dc	
Bike miles per kWh	45 80	Cynergyebikes.com
Annual bike miles	32,850 58,400	Calculated

Bicycle Charging Station Costs

- Four standard plugs, bicycle rack/station and signage
- Cost will depend on siting and design features of the bicycle charging station
 - Recommend siting it near the campground's ground mounted PV array and running the electric cable in the same conduit trench to the campground's electric panel
- Very rough cost estimate: \$5,000

PV Water Heating for Campground Showers

If the Campground's water heating was converted from liquid propane (LP) to electric. Most likely the LP hot water heater would be replaced with an electric hot water heater. The Campground's PV system would be increased in size to meet the annual electrical water heating needs.

Annual Estimated Show Water Use Assumptions and Calculations

Camp sites	54	
Days open/year	199	
Showers/site/day	1	
Site occupancy	100%	
Showers per year	10,746	
Length of shower	3	Minutes, assuming timed shut off ⁸
Water flow rate	1.5	Gallons/minute, assuming low flow shower head
Hot water use/year	64,476	Gallons
Hot water use/day	324	Gallons

Annual Estimated Shower Water Heating Electricity Use

Water temp in	55	°F
Water temp out	120	°F
Energy needed to heat one gallon by 1 degree F	8.33	BTU/°F/gallon
BTU needed	541.45	BTU
	0.00029307	
BTU to kWh conversion	1	kWh/BTU
Heating efficiency	95%	
PV energy to heat 1 gallon	0.1670	kWh
Total PV power needs	8,077	kWh/year
PV system "efficiency" kWh/kW dc	1300	
PV needed	6.2	kW dc

PV Water Heating Economics

Cost Estimates:

⁸ This may also assume that there is a payment for the showers (\$1 to \$2/shower), otherwise users could easily take more than one three minute shower.

- Final Cost of PV System: \$10,540
 - Installed cost PV System: 6.2 kW dc * \$2,000/kW dc = \$12,400
 - Focus on Energy incentive: \$12,400 * 15% = \$1,860
- Electric water heating conversion: \$10,000
 - Electric hot water boiler (two⁹, 100 gallon, 220 gallons/hour recovery rate increasing temperature by 70 °F): \$5,000
 - Electric service upgrade¹⁰ and other costs: \$6,000
- Total cost estimate: \$21,540

Current LP Cost Estimate

Water Heating Energy Needs for Showers	27,090,410	BTU/year
Energy Content of LP	91,502	BTU per gallon at 60 °F
Amount of LP used	296.	Gallons/year
Cost of LP	\$1.65	Per gallon at 60 °F (Average Wisconsin residential price over the last three years)
Annual LP Cost/Annual Energy Cost Savings	\$490	

Solar Water Heating Simple Payback Period

	Cost	Simple Payback Period	
PV only (assuming existing hot water heater is at the ends of its life and needs to be replaced and electric and LP hot water heater installation costs are similar)	\$11,050	22	years
PV and new water heater	\$21,050	44	years

If there was a \$1/shower fee, that would increase revenue by \$10,760/year.

⁹ By limiting showers to 3 minutes, may be able to use only one hot water heater.

¹⁰ May need to increase service to 240 volts.

Annex 1.1, Google Map Image of Lussier Heritage Center
from Helioscope modeling software



Annex 1.2, Google Map Image of the Lake Farm Campground from Helioscope modeling software for the



Annex 2. Definition of Financial Terms

Simple Payback Period

- Defined as: The system cost less all incentives, including depreciation benefits, divided by year one bill savings
- Does not include: maintenance, insurance, output degradation, increased value of power production, etc.

Years to Cost Recovery

- The year the system's cumulative cash flow goes positive
- Includes: electric price changes, output degradation, maintenance and insurance costs, etc.

Internal Rate of Return (IRR)

- Definition 1: The actual return provided by the project's cash flows
- Definition 2: The interest rate at which the net present value of all the cash flows (both positive and negative) from a project or investment equal zero
- Can be used to compare other investment returns

Discounted Net Present Value (NPV)

- The difference between the discounted value of cash inflows and the discounted value of cash outflows
- Discounting uses the discount rate, the discount rate is
 - The percentage that each future year's cash inflows and outflow are reduced to reflect the time value of money