

Hollis NH School District Purchasing Department

Request for Bids

For engineering, procurement, construction and installation of two roof mounted 100 kW solar photovoltaic arrays, in compliance with Hollis Town Planning Board regulations, construction of the solar arrays and connection of the arrays to the Hollis Primary and Hollis Upper Elementary school grid interconnection points.

April 6, 2017

Prepared by:
Hollis School District

Confidential and Proprietary

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SECTION 1 – INVITATION TO BID

The Hollis School District, [herein referred to as “HSD” or “Purchaser”] is seeking bids for the engineering, procurement and construction of two 100 kW, solar photovoltaic (PV) systems to be located on the Hollis Primary (HPS) and Hollis Upper Elementary (HUES) Schools.

Respondents to this RFP are herein referred to as “Bidder”, “Respondent”, “Contractor” or Vendor”.

The location of the properties at which the PV projects are to be located, herein referred to as the “Sites”, are at:

36 Silver Lake Rd, Hollis, NH 03049 (Hollis Primary School) and 12 Drury Lane, Hollis, NH 03049 (Hollis Upper Elementary School):

Complete submittal packages must be submitted to SAU41 ADMINISTRATOR AND BUSINESS ADMINISTRATOR **no later than 4:30 PM, Friday April 28, 2017 at 4 Lund Lane Hollis, NH 03049.** Instructions for making submittals are provided in **Section 2** - Instructions for Bidders.

To help the bidding Contractors understand the site location and conditions, there will be a mandatory site visitation Friday April 14, 2017 at 10:00 AM at the Hollis Upper Elementary School, 12 Drury Lane, Hollis NH 03049. We will start with a tour of HUES and then proceed to HPS.

This is an Invitation to Bid for interested, independent Contractors. The terms “Bid” and “Proposal” are used interchangeably throughout this document as are the terms, “Bidder”, “Respondent”, “Vendor” and “Contractor”.

Proposal packages must be marked “Hollis Schools Solar Project”.

- 1) It is the intent of SAU41 ADMINISTRATOR that the requirements in Sections 1 - 8 be read, understood and complied with to complete the project.
- 2) SAU41 ADMINISTRATOR reserves the right to reject any or all submittals, as it shall deem in the best interests of SAU41 ADMINISTRATOR. SAU41 ADMINISTRATOR also reserves the right to waive any informalities or technicalities in submittals as it shall deem in its best interests. All submittals will become the property of SAU41 ADMINISTRATOR.
- 3) Prior to the submission of the Proposal, the Bidder shall make and shall be deemed to have made a careful examination of the work to be performed and all other matters that may affect the cost and time of completion of the two potential installation projects.
- 4) All information contained herein as well as any submitted reports shall be deemed confidential in nature and must not be disclosed to other parties besides SAU41 ADMINISTRATOR.

SECTION 2 – INSTRUCTIONS FOR BIDDERS

I. Project Identification

- 1) Contact: SAU41 ADMINISTRATOR Andrew Corey or BUSINESS ADMINISTRATOR Kelly Seeley
- 2) Mailing Address: 4 Lund Lane, Hollis NH 03049
- 3) Project Name: Hollis Schools Solar Project, 36 Silver Lake Rd, and 12 Drury Lane, Hollis, NH 03049
- 4) Purchasing Agent: SAU41 Business Administrator Kelly Seeley

II. Schedule To Receive Proposals

- 1) Proposals will be received by SAU41 ADMINISTRATOR AND BUSINESS ADMINISTRATOR on or before 4:30 PM Eastern Standard Time, Friday, April 28, 2017. Any proposals received subsequent to the time specified will be rejected.

III. Manner of Submitting Proposals

- 1) Proposals defining terms and conditions and supporting documentation must be submitted electronically in PDF format via email and followed by physical media, CD or thumb drive. Bidders also should provide six (6) copies of paper proposals in addition to electronic submission. Delivery of proposals shall be sent to:

SAU41 Administrative Building
ATTN: Hollis Schools Solar Project
4 Lund Lane
Hollis, NH 03049
andy.corey@sau41.org, AND kelly.seeley@sau41.org

Please also send electronically to owner's representative Charlie Niebling at niebling@inrslc.com.

IV. Receipt of Submittals

- 1) Proposals will be received by SAU41 Administrator no later than the time and at the place stated in the Invitation to Bid.
- 2) Proposals must be submitted in both hard copy and electronic format. Initial submittals can be made in either hard copy or electronic format. If initial submittal is in electronic format, respondent shall also submit six (6) hard copies to SAU41 Administrator within five (5) days of the delivery due date. Each hard copy Bid must be submitted in a sealed envelope, addressed to SAU41 Administrative Building, 4 Lund Lane, Hollis, NH 03049. Each sealed envelope containing a Bid must be plainly marked on the outside with "HSB PV Solar Array", the name of the Bidder and their address. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed to SAU41 Administrative Building, 4 Lund Lane, Hollis, NH 03049.

- 3) Bidders should provide to SAU41 Administrator the following information referenced in this section, below. **The information may be submitted with the Proposal, or provided prior to submission of the Proposal.** The requested information as outlined in this section will aid SAU41 Administrator in evaluating the RFP submittals and to ensure that Bidder's proposed configuration is suitable for the intended application. The Bidder should feel free to provide any additional information they feel is appropriate and might be needed to demonstrate the abilities of their services. Please provide the following:
 - a. A fixed price quote for the project, to be owned and operated by SAU41 ADMINISTRATOR (turnkey model)
 - b. Firm quotes shall include the following:
 - Timeline for the start of installation and completion of work – (Work must be completed between June 24 and August 25, 2017)
 - Specification cut sheets for inverters, modules, monitoring system, meteorological system, racking system, major electrical components and camera system, if included as an option.
 - List of any proposed sub-Contractors
 - Bidding company and sub-Contractors background, experience and qualifications. Please provide a list of similar projects done within the last five years with the address, name and contact information. Please feel free to submit any other prior project information you believe will be helpful for SAU41 ADMINISTRATOR to know your companies experience. We are particularly interested in 100KW projects or larger installed on buildings of this size and any school related projects you have completed.
 - A completed price matrix (Appendix Item A)
- 4) Upon completion of the array installations, a complete set of marked-up, as-built plans shall be provided to SAU41 ADMINISTRATOR. The Contractor shall work with SAU41 ADMINISTRATOR so the as-built plans can be completed and are accurate with the finished work at each site.
- 5) For any material or equipment purchased all documentation will be provided to SAU41 ADMINISTRATOR. Additionally, any manufacture warranty will be transferred and supporting documentation provided to SAU41 ADMINISTRATOR.

V. Examination of Contract Documents and Site

- 1) Each Bidder is responsible for inspecting the site at the appointed time only [**Friday, April 14, 2017, 10:00 AM**] and for reading and being thoroughly familiar with the project requirements and proposed contract documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to their proposal. If any bidder needs additional site visits these must be scheduled through the District's Owner's Representative. Please do not arrive on the site unannounced as you will be declined access.
- 2) Bidders must satisfy themselves as to the accuracy of any estimated quantities in the Pricing Sheet.

VI. Due Diligence

- 1) Prior to submission of the Proposal, the Bidder shall make, and shall be deemed to have made, a careful examination of the Plans, Specifications, Construction Drawings, and form of

Proposal, and shall review the location and nature of the proposed construction, the kind of facilities required before and during the construction of the project, general local conditions, environmental and historic preservation considerations, and all other matters that may affect the cost and time of completion of the work. Bidder will be required to comply with all federal, state, and local laws, rules, and regulations applicable to its performance, including those pertaining to the licensing of Contractors.

VII. Evaluation Factors

- 1) In evaluating the proposals, SAU41 ADMINISTRATOR will consider, in addition to the price quoted in the Proposals, the following:
 - a) Compliance with the Scope of Work and other bid documents
 - b) Clarity, Pricing Structure, Commercial Terms, and Conditions
 - c) Execution Plan and Project Team: Ability to meet Schedule, Provide relevant resources
 - d) Bidder's experience with similar sized systems (please provide examples and references)
 - e) Bidder's experience working in a school environment
 - f) Solar Panel Maintenance and Reliability History
 - g) Length and Securitization of Warranty/Guarantees
 - h) Life Cycle Costs, including operational and maintenance requirements

VIII. Contract is Entire Agreement:

- 1) The final written Contract resulting from negotiations and clarifications shall be deemed to include the entire agreement between the parties thereto, and the Bidder shall not claim any modifications thereof resulting from any representation or promise made at any time by any officer, agent or employee of SAU41 ADMINISTRATOR or by any other person.

IX. Proposed Bid Submittal/Vendor Selection Schedule

- 1) SAU41 ADMINISTRATOR reserves the right to accept any Proposals, in whole or in part, deemed to be in the best interest of SAU41 ADMINISTRATOR, to waive any irregularities in any Proposal and/or to reject any and or all Proposals and re-advertise for new Proposals. SAU41 ADMINISTRATOR shall not be liable for any expenses or costs incurred in the preparation or presentation of the proposals.
- 2) SAU41 ADMINISTRATOR, its designated employees and agents shall be the sole judge of the submittals and the vendor evaluation and selection will be made on the basis of the best interest of SAU41 ADMINISTRATOR. In the evaluation of submittals, full consideration will be given to several factors including completeness of proposal package, overall price, respondent's experience and ability to perform the work in an expeditious manner, respondent's financial stability and references from work with similar projects.

- 3) SAU41 ADMINISTRATOR has established the following timetable for selection of a vendor, negotiating a contract, and completing project:

Issue Invitation to Bid	Thursday, April 6, 2017
Site Walk Through (mandatory for bidders)	Friday, April 14, 2017, 10:00 AM
Deadline to submit written questions on RFP	Tuesday, April 18, 2017, 4:30 PM
Answers to questions posted on Hollis SD website	Friday, April 21, 2017, 4:30 PM
Proposal Due Date	Friday, April 28, 2017, 4:30 PM
SAU41 ADMINISTRATOR Vendor Decision and Notification (NOTE: <u>may</u> include request for interview prior to 5/5/17)	Friday, May 5, 2017
Finalize and Execute Contract	Friday, May 19, 2017
Project Completion	Friday, August 25, 2017

Any questions regarding this RFP should be submitted in writing only via email no later than 4:30 PM, Tuesday, April 18, 2017 to:

Charlie Niebling
 Hollis School District Owner's Representative
 Innovative Natural Resource Solutions LLC
niebling@inrslc.com

No phone calls please.

SECTION 3 – STANDARD TERMS AND CONDITIONS OF CONTRACT WITH SUCCESSFUL BIDDER

PRICING

Prices for all goods and/or services shall be firm for the duration of the contract and shall be stated on the Pricing/Delivery Information form. Prices shall be all inclusive: No price changes, additions, or subsequent qualifications will be honored during the course of the contract. All prices must be written in ink or typewritten. Pricing on all transportation, freight, drayage and other charges are to be prepaid by the Contractor and included in the bid prices. If there are any additional charges of any kind, other than those mentioned above, specified or unspecified, offeror MUST indicate the items required and attendant costs or forfeit the right to payment for such items.

ASSIGNMENT

The successful offeror may not assign, sell or otherwise transfer this contract without written permission of Hollis School Board cooperative.

WARRANTIES

Offerors shall furnish all data pertinent to warranties or guarantees, which may apply to items in the bid. Offerors may not limit or exclude any implied warranties. Offeror warrants that product sold to SAU41 ADMINISTRATOR shall conform to the standards established by the U.S. Department of Labor under the Occupational Safety and Health Act of 1970. In the event product does not conform to OSHA Standards, where applicable, SAU41 ADMINISTRATOR may return the product for correction or replacement at the offeror's expense. If offeror fails to make the appropriate correction within a reasonable time, SAU41 ADMINISTRATOR may correct at the offeror's expense.

PURCHASE ORDER AND DELIVERY

The successful offeror shall not deliver products or provide services without a SAU41 ADMINISTRATOR Purchase Order, signed by an authorized representative of SAU41 ADMINISTRATOR. The fastest, most reasonable delivery time shall be indicated by the offeror in the proper place on the Pricing/Delivery Information form. Any special information concerning delivery should also be included, on a separate sheet, if necessary. All items shall be shipped F.O.B. destination unless otherwise stated in the specifications. This shall be understood to include bringing merchandise to the appropriate room or place designated by the using department. Every tender or delivery of goods must fully comply with all provisions of these requirements and the specifications including time, delivery and quality. Nonconformance shall constitute a breach, which must be rectified prior to expiration of the time for performance. Failure to rectify within the performance period will be considered cause to reject future deliveries and cancellation of the contract by SAU41 ADMINISTRATOR without prejudice to other remedies provided by law.

INVOICES AND PAYMENTS

Offeror's shall submit invoices in duplicate on each purchase order or purchase release after each delivery, indicating the purchase order number. Invoices must be itemized. Any invoice, which cannot be verified by the contract price and/or is otherwise incorrect, will be returned to the offeror for correction. Contracts providing for a monthly charge will be billed and paid on a monthly basis only. Payments will be made net (30) unless otherwise agreed upon.

TERMINATION

SAU41 ADMINISTRATOR reserves the right to terminate the contract for default if offeror breaches any of the terms therein, including warranties of offeror or if the offeror becomes insolvent or commits acts of bankruptcy. Such right of termination is in addition to and not in lieu of any other

remedies, which SAU41 ADMINISTRATOR may have in law or equity. Default may be construed as, but not limited to, failure to deliver the proper goods and/or services within the proper amount of time, and/or to properly perform any and all services required to SAU41 ADMINISTRATOR's satisfaction and/or to meet all other obligations and requirements. Contracts may be terminated without cause upon thirty (30) days written notice to either party unless otherwise specified.

DELIVERY

If delivery is required, all items must be packaged so as to be protected from damage during shipping and handling. Any item(s) damaged in shipping must be replaced in kind, or repaired, by the Contractor, at the discretion of SAU41 ADMINISTRATOR and at no additional charge to SAU41 ADMINISTRATOR.

HOLD HARMLESS AGREEMENT

Contractor, the successful offeror, shall indemnify and hold SAU41 ADMINISTRATOR harmless from all claims for personal injury, death and/or property damage resulting directly or indirectly from Contractor's performance. Contractor shall procure and maintain, with respect to the subject matter of this bid, appropriate insurance coverage including, as a minimum, public liability and property damage with adequate limits to cover Contractor's liability as may arise directly or indirectly from work performed under terms of this bid. Certification of such coverage must be provided to SAU41 ADMINISTRATOR.

WAIVER OF SUBROGATION

Offeror and offeror's insurance carrier waive any and all rights whatsoever with regard to subrogation against SAU41 ADMINISTRATOR as an indirect party to any suit arising out of personal or property damages resulting from offeror's performance under this agreement.

ASSIGNMENT OF CONTRACTUAL RIGHTS

The successful Bidder will not assign, transfer, convey or otherwise dispose of the contract or its right, title or interest in or to the same, or any part thereof, without previous written consent of SAU41 ADMINISTRATOR and any sureties.

INSURANCE

The successful Bidder and any of its approved assignees or sub-contractors, or anyone employed by them directly or indirectly, shall at their own expense, maintain throughout the term of the Contract, insurance coverage of such type and amount as may be necessary to protect its own and the interests of SAU41 ADMINISTRATOR against all hazards or risks of loss arising from performance under of the Contract.

FORCE MAJEURE

The successful Bidder shall be excused from performance hereunder during the time and to the extent that he is prevented from obtaining, delivering, or performing in the customary manner, by acts of God, fire, war, loss or shortage of transportation facilities, lockout or commandeering of raw materials, products, plants or facilities by the government. Successful Bidder shall provide SAU41 ADMINISTRATOR satisfactory evidence that non-performance is due to other than fault or negligence on his part.

WARRANTY

Unless otherwise provided elsewhere in the Contract, all materials and equipment incorporated into any work covered by the contract shall be new and, where not specified, of the most suitable grade of

their respective kinds for their intended use, and all workmanship shall be in accordance with construction practices and meet requirements NHPUC C&I Solar Incentive program and applicable current building codes and acceptance from SAU41 ADMINISTRATOR. Unless otherwise provided in the contract, Contractor warrants all equipment, materials, and labor furnished or performed under this contract against defects in design, materials and workmanship (unless furnished by SAU41 ADMINISTRATOR), for a period of twelve (12) months (unless longer guarantees or warranties are provided for elsewhere in the contract in which case the longer guarantees or warranties provided for in the contract shall prevail) from and after final acceptance under the contract, regardless of whether the same were furnished or performed by Contractor or by any of its sub-contractors of any tier. Upon receipt of written notice from SAU41 ADMINISTRATOR of any defect in any such equipment, materials, or labor during the applicable warranty period, due to defective design, materials or workmanship, the affected item or parts thereof shall be redesigned, repaired or replaced by Contractor at a time acceptable to SAU41 ADMINISTRATOR.

UNIFORM COMMERCIAL CODE

The applicable provisions of the Uniform Commercial Code shall govern this contract.

OWNERSHIP OF DATA

All data and other records entered into any database of SAU41 ADMINISTRATOR or supplied to the CONTRACTOR by SAU41 ADMINISTRATOR are, and shall remain, the sole property of SAU41 ADMINISTRATOR. CONTRACTOR shall not copy or use such records without SAU41 ADMINISTRATOR's written consent except to carry out contracted work, transfer such records to any other party not involved in the performance of this Agreement; and will return submitted records to SAU41 ADMINISTRATOR upon completion of the work hereunder.

AFFIRMATIVE ACTION

CONTRACTOR shall comply with all federal and state requirements concerning fair employment and employment of the handicapped, and concerning the treatment of all employees, without regard to, or discrimination by reason of race, color, religion, sex, national origin, or physical handicap. To the extent legally permissible, Contractor also agrees to indemnify, defend and hold SAU41 ADMINISTRATOR harmless from any and all costs, fines, penalties, damages and liabilities assessed against SAU41 ADMINISTRATOR as a result of Contractor's noncompliance therewith.

DELIVERY

All orders are F.O.B. destination with all transportation and handling charges paid by the Contractor. Deliveries shall be made at such time, place and in such quantities as shown on the purchase order. All items in common usage are to be shipped within 30 days from the date of purchase order. An additional 10 days will be allowed for back-ordered items when notification is given, in writing, to the ordering agency that the items are not available for immediate delivery.

TAX IDENTIFICATION NUMBER

Contractor shall provide SAU41 ADMINISTRATOR with a tax identification number and W-9 prior to the start of any service or agreement with SAU41 ADMINISTRATOR.

CONFIDENTIALITY

Contractor agrees that it, its employees, attorneys, consultants, representatives, Contractors, sub-contractors, agents and affiliates will not disclose to others any confidential information furnished by SAU41 ADMINISTRATOR. "Confidential information" shall include, but not necessarily be limited to, information such as historical data from our databases, costs to perform, Contractor information, schedules, SAU41 ADMINISTRATOR business practices, etc. Contractor shall maintain the information

in confidence and not disclose such information or transmit any copies containing such information to any third party without the prior written consent of SAU41 ADMINISTRATOR. The information shall be used solely in connection with Contractor's work for SAU41 ADMINISTRATOR. Subject information is considered competition and business sensitive. Title to confidential information shall remain with SAU41 ADMINISTRATOR. Contractor will not make a greater number of copies of confidential information than necessary for preparation of its work for SAU41 ADMINISTRATOR. Contractor shall promptly return confidential information and all copies thereof to SAU41 ADMINISTRATOR upon SAU41 ADMINISTRATOR's request.

PROTECTION

Contractor shall maintain appropriate internal policies and procedures adequate to protect the confidential nature of the information, including agreements with employees to prevent unauthorized disclosure or publication of such information. Access to the information shall be limited to those of its employees having a need for such access in connection with Contractor's work for SAU41 ADMINISTRATOR.

INDEMNITY

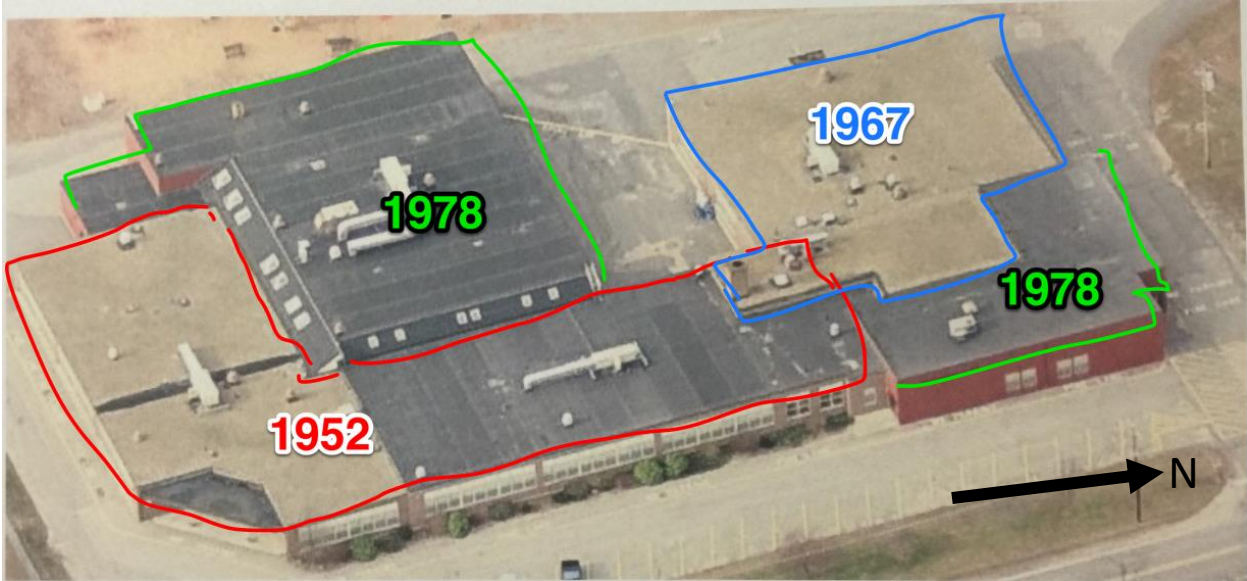
Contractor shall indemnify and hold SAU41 ADMINISTRATOR, its officers, employees and agents harmless from any cost, loss, fine, penalty, liability, claim, action or proceeding of any type whatsoever founded upon Contractor's use of confidential information in violation of the terms of this agreement.

GOVERNING LAW AND VENUE

The rights and obligations arising from the Contract shall be governed by the laws of the State of New Hampshire. Any action brought by either party shall be brought only in a state or federal court of competent jurisdiction located within New Hampshire.

SECTION 4 – SCOPE OF WORK

Hollis School Board (SAU41 ADMINISTRATOR) intends to have a 100 kW AC or greater, grid-tied solar photovoltaic (PV) system on both Hollis Primary and Hollis Upper Elementary Schools. The proposed sites are shown in the pictures below, with approximate orientation of due north arrow.



Hollis Primary School
N 42.7473283 lat, W 71.5965245 long



Hollis Upper Elementary School
N 42.7465994 lat, W 71.6006448 long

HSB is requesting bids on one option but we encourage the bidders to include options for different technical approaches to solar PV array they believe may work best for SAU41 ADMINISTRATOR but that may not be contemplated in these documents.

SAU41 ADMINISTRATOR also welcomes design suggestions for bidders to improve site lifetime production and lower costs, including, but not limited to, opportunities for future expansion of generation capacity.

I. Arrays

- 1) Contractor shall furnish a roof-mounted, fixed-tilt Project for SAU41 ADMINISTRATOR at the specified level of energy production.
- 2) The Project shall be capable of operating in accordance with the terms and conditions outlined in this Agreement.
- 3) Specify and furnish the equipment and materials which shall include, but not be limited to PV modules, structural support systems, module string DC wiring harnesses, DC combiner boxes, inverters, inverter step-up transformers, and ancillary hardware required to connect and operate listed equipment.
- 4) Contractor shall design and construct the Project in accordance with the Agreement and this Scope of Work. Scope of Work shall consist of:
 - a) Project design engineering and drawing packages for construction permitting, installation and "as-built" documentation.
 - b) Project construction including all site/civil work, structural, electrical, mechanical and monitoring/control systems unless otherwise noted. This includes evaluation of roof structural capability to support additional weight loading of PV installations, including panels, racking and anchoring.
 - c) Project and construction management, including quality assurance/quality control with associated documentation, site safety and documentation, site material control and management of all sub-contractors.
 - d) Project commissioning and testing in accordance with Section 7.
 - e) Project turnover including any Job Books, SAU41 ADMINISTRATOR training on the entire facility, and Project operations and maintenance documentation.
- 5) Contractor shall be responsible for obtaining, and providing copies to SAU41 ADMINISTRATOR of all required building and electrical permits necessary to support construction and Project installation. Contractor shall comply with any and all requirements defined in the SAU41 ADMINISTRATOR provided development permits. Once the project is complete, final town approval documents shall be provided to SAU41 ADMINISTRATOR.
- 6) Contractor shall be responsible for interconnection to the public utility at the service entrance for each building.

II. Additional Requirements

- 1) All work shall comply with all NH Department of Environmental Services required Best Management Practices for construction, if applicable.
- 2) In the event that any Applicable Law or Industry Standard does not govern specific features of any item of equipment and materials, Temporary Work or system, Contractor or Original Equipment Manufacturer (OEM) standards shall be applied, with SAU41 ADMINISTRATOR's approval. Where local codes or ordinances will have an impact on the design, SAU41 ADMINISTRATOR and Contractor shall jointly address these with the local authorities having jurisdiction.
- 3) Listed applicable codes and standards as listed on Town of Hollis NH "Current Building Codes for the Hollis Building Department" are applicable in the design, fabrication and installation of the Project; these are not intended to be all inclusive. Where local codes or ordinances will have an impact on the design, Contractor shall be responsible for meeting the codes or obtaining variances from local authorities having jurisdiction.
- 4) The system design shall deliver 100KW AC at each site but Bidders are requested to also design systems to allow for potential future expansion of the array to further maximize output throughout the day or an increase in KW output. We welcome proposals utilizing highest efficiency output panels to optimize space to allow for future expansion.
- 5) A 100% performance bond will be required of successful bidder.
- 6) Successful bidder will be expected to work with Hollis project officials and owner's representative in seeking qualification of Eversource net metering interconnection, and submission to NH Public Utilities Commission commercial solar category 1 rebate applications for both installations. These are time sensitive processes and the successful bidder will be expected to assist with these as soon as a contract is negotiated and finalized.
- 7) The Hollis School District desires to use the HPS and HUES solar installations for student and resident educational and instructional purposes. Accordingly, successful bidder will be expected to advise and assist in design of user data interface that will allow monitoring and interpretation of solar performance for educational purposes.

III. Schedule of Work

- 1) SAU41 ADMINISTRATOR expects the Contractor to minimize disruption and noise at both schools during construction. All State and Town ordinances must be followed. Bidders must submit a schedule of work included in the bid for this project.

SECTION 5 – SPECIFICATIONS

The complete Scope of Work can be found in **Section 5** of this document. The bid information checklist must be completed by the bidder (**Appendix Item E**). If you wish to use equipment other than from those manufacturers listed in this section, you must provide justification that it is technically equivalent to the equipment of one of the listed companies.

I. Definitions

- a) “AC” or “ac” shall mean alternating current.
- b) “Acceptance Test Procedures” shall mean a document, or set of documents, agreed to by SAU41 ADMINISTRATOR and Contractor which detail the procedures to be completed during acceptance testing and requirements which must be met.
- c) “Array” shall mean a collection of solar modules connected in series, all tying into a single inverter, multiple string inverters or micro inverters.
- d) “AHJ shall mean the authority having jurisdiction. The authority can be any governing body that sets requirements or conditions related to the project design, construction and operations.
 - e) “Contractor” shall refer to the organization to which this Scope of Work is addressed and who will construct the Project as specified within this document.
 - f) “DC” or “dc” shall mean direct current.
 - g) “HZ” shall mean hertz.
 - h) “Independent Engineer” shall refer to SAU41 ADMINISTRATOR or its own contracted engineering firm who will approve various technical decisions related to the project engineering, procurement, and construction.
- i) “Job Books” shall mean the set of documents describing the work completed on the project. They include but are not limited to engineering drawings and calculations, procurement invoices and materials quality documents, and construction quality, safety, and commissioning documentation. They also include final performance testing, as-builts, maintenance schedules and operating instructions and manuals. Two complete sets of documents shall be submitted to SAU41 ADMINISTRATOR.
 - j) “SAU41 ADMINISTRATOR” shall refer to the organization who the Contractor will enter into an agreement with to complete all Project requirement as specified in this Scope of Work.
- k) “POI” shall mean the Point of Interconnection which defines the location of the physical electrical interconnection to the grid.
- l) “Power Capacity Guarantee” shall mean an agreement between the Contractor and SAU41 ADMINISTRATOR in which the capacity of the Project is described. This

capacity guarantee will include environmental and Project conditions at which the capacity is tested.

- m) "Power Capacity Test" shall mean a power output capacity test to confirm that the Project has met the plant output guarantee. The test shall consist of a DC capacity test, an AC capacity test and a system losses test.
- n) "PV" shall mean photovoltaic.

II. Design Criteria

- a) Project and individual components shall have a minimum design life of 25 years or a proposed replacement plan.
- b) Project shall be designed for fully automatic operation.
- c) Contractor shall provide a final project energy production estimate that corresponds to the final design.
- d) Project shall be so designed as to maximize total electricity production and deliveries to SAU41 Administrator
- e) Dissimilar metals in contact anywhere in the Project shall be avoided to eliminate the possibility of galvanic action.
- f) Modules to be tilted to maximize annual production (typically between 45 and 50 degrees from horizontal ground) unless otherwise agreed to by SAU41 ADMINISTRATOR.
- g) Take maximum advantage of south facing tilted roof at the HUES.

III. Project Equipment

- a) Provisions shall be included in the design of all systems to allow the performance of all routine maintenance without requiring a shutdown of the entire Project.
- b) Contractor shall furnish all equipment and materials as required to construct a fully functioning Project. All equipment and materials shall meet applicable standards and the system shall be designed to all applicable codes.
- c) Contractor shall:
 - 1. Receive, inspect, store, unload, maintain, erect, clean, align, and prepare all equipment in accordance with equipment manufacturer's instructions before initial operation.
 - 2. Select materials for construction and design equipment and systems to provide a minimum of a 25- year operating life at all operating conditions specified.
 - 3. Design the facility for a life of 25 years consistent with good engineering practice for solar generation facilities. However, it is understood that some of

the equipment will require routine maintenance and possible replacement during the life of the facility.

4. Provide grounding lugs and ground all equipment.

IV. PV Modules

- a) Module spec sheet to be included in drawings and utilized for all engineering calculations.
- b) Glass laminates or glazing with low reflectivity are preferred.
- c) Manufactured to ISO9001:2000 and ISO 9001 quality and ISO14001:2004 or successor environmental standards, NEC code requirements, and UL listing specifications.
- d) Modules must meet UL 1703, IEC 61730, IEC 61215 (crystalline technologies) or IEC 61646 (thin film technologies)
- e) Modules to be warranted with a linear degradation of no more than 3% the first year and .7% all subsequent years for 25 years.
- f) Modules to be delivered in power tolerance of no worse than -0W and +3W as measured at the factory.
- g) Modules may be procured from the following vendors without approval from the SAU41 ADMINISTRATOR. Vendors may specify other modules with justification provided in writing as part of bid submission.
 1. Trina
 2. Yingli
 3. SunPower
 4. SolarWorld
 5. Canadian Solar
 6. Hanwha
 7. SolarOneJA Solar
 8. tenK Solar
 9. MEMC SunEdison
 10. MAGE
 11. Suniva

V. Module Support Structure - Racking

- a) The module support structures shall be designed and constructed to provide a stable support system for the PV modules that will remain effective throughout the design life of the Project. Module support structures shall meet all applicable codes and standards.
- b) The maximum support structure deflections shall prevent PV module and electrical system damage and shall not exceed allowable limits provided by the manufacturer and the IBC 2009 and ASCE 7-05 or successor codes

- c) Racking may be procured from the following vendors, or from other vendors with justification provided in writing as part of bid submission.
 - 1. Schletter
 - 2. Solar FlexRack
 - 3. Hilti
 - 4. Legrand
 - 5. Schuff
 - 6. Unirac
 - 7. Sunlink
 - 8. Array Technologies
 - 9. SunPower
 - 10. GameChange may be considered but requires SAU41 ADMINISTRATOR approval.

VI. DC Wiring

- a) DC cable shall meet all NEC and NESC specifications for electricity generation and transmission. Cable shall be selected and sized for its specific application and all cable shall meet standards as previously listed.
- b) Any fuses shall be readily accessible and replaceable.
- c) Wiring harnesses and cabling shall be UL listed.
- d) Wiring harnesses shall use tee tap connectors and in-line fuses when required for paralleling circuits outside DC combiner boxes.
- e) Materials used for cable fastening shall have an expected life of 25 years.

VII. DC Combiner Boxes

- a) Enclosures shall be rated NEMA 4 with continuous hinge single door with three point latch or engineer approved equivalent multi-point latching. Provisions for padlocking are required.
- b) Combiner boxes shall be at the end of the row if possible and above ground.
- c) All combiner box electrical systems, both inside and outside the combiner box itself, must meet NEC and UL standards and listings.
- d) Combiner boxes must include protection that meets the NEC.
- e) Combiner box spec sheet to be included in drawings and utilized for all engineering calculations.
 - 1. Combiner boxes may be procured from the following vendors, or from other vendors with justification provided in writing as part of bid submission. SolarBOS
 - 2. Shoals
 - 3. Cooper Crouse-Hinds
 - 4. Sunlik

5. AMtec
6. Bentek
7. Sunergy

VIII. Inverter Assembly

- a) A string and micro-inverter design is preferred over central inverter design.
- b) Inverter minimum CEC efficiency is 97%.
- c) Output current harmonics must be <3%
- d) Capable of full rated output at 122°F ambient.
- e) UL 1741 and IEEE 1547 compliant.
- f) Must be rated to withstand -40°F.
- g) 600Vdc minimum, 1000Vdc or higher preferred if allowable by the AHJ and approved by SAU41 ADMINISTRATOR.
- h) Inverter warranty must be for 15 years or greater
- i) Inverter spec sheet and general arrangement to be included in drawings and utilized for all engineering calculations.
- j) Inverter may be procured from the following vendors, or from other vendors with justification provided in writing as part of bid submission. Preferred inverter is a 3 ϕ String Inverter in the 20 KW to 40 KW size similar to a 24 KW SMA Tripower.
 1. SMA
 2. Chint
 3. Solar Edge
 4. Enphase

IX. Array Monitoring and Data Acquisition

- a) Contractor shall supply, install and commission the array monitoring system hardware at the site.
- b) Monitoring system shall display data in real-time and record and log performance data at regular intervals, five minute data capture or higher resolution is preferred. The data shall be directed through the internet for remote access, monitoring and data collection.
- c) Communications shall be transmitted via an Ethernet or RS485 or Modbus infrastructure (unless otherwise approved by SAU41 ADMINISTRATOR) to a remote terminal unit (RTU).
- d) Revenue grade meter is required to meter all production. Meter and site DAS to have minimum local data storage to be at least 90 days.
- e) Remote communication to be via cell modem for Internet based monitoring. SAU41 ADMINISTRATOR will supply cellular line as needed. Contractor to consult with SAU41 ADMINISTRATOR to determine preferred network vendor.

- f) Monitoring System
 - 1. Contractor shall program the control software for the project on an industry-standard platform for easy integration into SAU41 ADMINISTRATOR's operations or website.
 - 2. Preferred platform is a Deck/Also Energy using Obvius Acquisuite, or other platform with justification provided in writing as part of bid submission.
 - 3. Must be able to transmit and report, inverter data, meter data and met station data in the energy monitoring system.

X. Meteorological Station

- a) One (1) met station is required. The met station data shall be part of the array monitoring system.
- b) Required data collection:
 - 1. Plane of Array (POA) irradiance
 - 2. Ambient Temperature
 - 3. Cell Temperature
 - 4. Global Horizontal Irradiance (GHI)
- c) Met station instrumentation spec sheet to be included in drawings.

XI. Spare Parts Inventory

- a) If other than a Power Purchase Agreement, the Contractor shall provide SAU41 ADMINISTRATOR with a list of recommended spare parts needed for routine maintenance as well as parts which may need to be replaced during the life of the Project as part of the Job Books.
- b) The spare parts list shall include an item description, original equipment manufacturer, supplier, identification/part number, quantity, equipment tag number, lead time and price.

XII. Corrosion Protection

- a) In general, all exposed carbon steel surfaces shall get a corrosion protection treatment. Contractor shall design and specify corrosion protection systems, which shall include surface preparation measures.

XIII. DC System Wiring

- a) Series string connections between modules will be via locking multi-contact connectors and jumpers factory-supplied with modules.
- b) All DC system wiring must meet NEC requirements and local codes.
- c) DC cabling may run above grade where allowed by code. Method to be reviewed and accepted by SAU41 ADMINISTRATOR.

XIV. AC System Wiring

- a) All conductors, lugs and cable accessories shall be UL listed.
- b) All AC system wiring must meet NEC requirements and local codes.

XV. Grounding

- a) All ground conductors and grounding systems shall be UL listed, if appropriate, and shall meet all NEC and code requirements.
- b) Inverters shall be bonded to a ground ring.

XVI. Labeling and Identification

- a) For diagnostic and troubleshooting purposes, all multi-string harness inputs to each combiner box and the combiner boxes themselves shall be uniquely tagged and identified with such tagging on the record construction drawings.
- b) As part of the deliverables that Contractor must deliver prior to Final Completion, Contractor shall provide to SAU41 ADMINISTRATOR a database including all module serial numbers which can be sorted by array, combiner box, and harness. Data shall also include the flash test from the factory.

XVII. Electrical Equipment Enclosures

- a) Control Cabinets, pull boxes and junction boxes shall be in accordance with NEMA Standards and type number and shall be suitable for the location conditions.

XVIII. Lightning Protection for Field Enclosures

- a) Lightning protection (where required) shall comply with the requirements of NFPA 780 Standard for the Installation of Lightning Protection Systems.

XIX. General Arrangements

- a) The location of equipment shall be based on safety, economics, ease of maintenance, and operation. Sufficient space shall be provided for maintenance of all equipment including equipment removal without excessive rigging or removal of surrounding equipment.

XX. Metering

- a) Contractor shall provide and install revenue grade meter located on the site in the DAS panel.

SECTION 6 – COMMISSIONING & TESTING

I. Overview

- a) The commissioning process provides a quality-oriented methodology for verifying and documenting the design, construction, functionality, and performance of the Project. The commissioning process shall ensure that all system components perform interactively to meet the defined system objectives and criteria of SAU41 ADMINISTRATOR.
- b) The commissioning agent to be used by the Contractor must be proposed to SAU41 ADMINISTRATOR as part of commissioning plan and agreed upon by SAU41 ADMINISTRATOR before start of work.
- c) Commissioning may not start until the Arrays are mechanically complete or separately approved by SAU41 ADMINISTRATOR.
 1. All commissioning activities shall be executed under a phased approach, as identified below. Activities of each phase shall be documented and submitted to SAU41 ADMINISTRATOR for review, acceptance, and documentation. Acceptance is not complete until SAU41 ADMINISTRATOR has reviewed and approved documentation related to:
 - i. Performance Test
 - ii. Warranties
 - iii. O&M Manuals
 - iv. Commissioning Manual and Data

II. Acceptance

- a) The Array is deemed operational at SAU41 ADMINISTRATOR's approval, including but not limited to:
 - a) The installation conforms to the system-design documents,
 - b) The conductors are of the appropriate types and size,
 - c) Wiring is correct, protected and secure,
 - d) Terminal connections are tight and properly identified,
 - e) Equipment is securely mounted,
 - f) Array mounting is secure,
 - g) Building penetrations are properly sealed,
 - h) Safety features are installed and operational,
 - j) Applicable warning and operational labels are properly installed and designed for indoor or outdoor exposure based on the equipment location,
 - k) The job site is clean, neat, and orderly and restored as much as possible to its

original condition or as designed in the plan set (Appendix Item D).

III. Final Completion

- a) The project is deemed complete at SAU41 ADMINISTRATOR's approval and final punch list completion and has passed the System acceptance test (SAT) and system reliability test (SRT).

SECTION 7 – System Acceptance Test (SAT) and System Reliability Test (SRT)

1. System acceptance test will be based on the following: Contractor will show via data taken from the system DAS that for a period of 1 day the system delivered the expected weather adjusted production to a level of 95%. A minimum irradiance will be 500 W/m² for the duration of the test.
 2. System Reliability test. This will be measured over a period of 5 days with a minimum irradiance of 250W/m². This period can include the 1 day SAT test period. Again actual production of the system will be 95% of the calculated value.
 3. Pass/Failure of a Power Capacity Test
 - i. If the corrected output measured at the sum of measurements at the inverter input is equal to or greater than the corresponding Power Capacity Guarantee, and assuming the other requirements established to successfully run the applicable Power Capacity Test has been met, then the Power Capacity Test will be deemed to have been successfully run.
 - ii. If the Test is deemed a failure, the Contractor will review and correct any Array issues and re-run the test. This process will continue until the Test passes.
- a) The measurements should be taken at 5, 10 or 15 minute intervals
- b) Expected energy will be determined using the below equation.
1. Determine the average of the back of module (BOM) temperatures per weather station data.
 2. Add 2°C to the average BOM to obtain the average cell temperature (T_{cell average})
 3. Correct the power output power measurements to account for cell temperatures different from the STC condition of 25°C using the formula

$$P_{tc} = P_{temp\ corrected} = P_{measured} / (1 + C_t (T_{cell\ average} - 25))$$

(Where C_t = the PV module output power temperature coefficient)

SECTION 8 – DRAWINGS

Drawings to be inserted once completed by Contractor and approved by SAU41 ADMINISTRATOR.

I. Site Plan

- a) North Arrow and Drawing Scale
- b) Indicate all major equipment: Modules, Service Disconnect, Metering, PV Disconnects, Inverters, Panel boards, Combiner Boxes, etc.
- c) Indicate circuit routing: above ground and underground
- d) Indicate general project details: project location city, county, state; associated coop and/or interconnecting utility; DC and AC project size
- e) Indicate point of interconnection and any other information regarding interconnection that constrains the site (existing or to be installed lines, transformer, meter, poles, etc.)

II. Electrical One-Line Diagram/s

- a) Indicate VOC, ISC, V_{mp} , I_{mp} ratings modules and array
- b) Show conductor size, Al or Cu, insulation type, conduit type and size for all circuits
- c) Show all fuses and breakers in switches, panel boards, and inverters as applicable. Indicate their amp rating.
- d) Show ratings of all equipment, including SCCR rating of equipment and AIC rating of breakers and switches. Show utility available fault current and calculated available fault current at equipment.
- e) Indicate labels per NEC and Fire Code requirements.
- f) Verify switch blades are on inverter side for both AC and DC switches
- g) Show inverter Watts AC, VDC range, VAC rating, 1 ϕ or 3 ϕ , make & model, + or – DC grounded
- h) If AL conductors are used, use bolt-on compression-type fittings for all terminations.
- i) Verify over-current protective devices are rated $\geq 125\%$ of load (AC circuits) or 156% of rated I_{sc} (DC circuits).
- j) If provided by Contractor, show PV system meter base volt and amp rating and form #. Verify correct form # with utility.
- k) Call-out to Utility Grid ratings: VLN/VLL rating, 1 ϕ or 3 ϕ , 3W or 4W, Transformer size, Available fault current.

III. Grounding Diagram/s

- a) Indicate grounding connections for PV array modules and racking
- b) Show DC GECs at inverters and supplemental GEC at PV array as required.
- c) Show AC GEC and main service bonding jumper at main service disconnect for new services and line side connections
- d) Indicate grounding electrode types and locations. Show bond(s) between AC and DC grounding electrodes.

Appendix B
Checklist of Bid Information (EXAMPLE)

<u>PV Module Specification</u>	<u>Requirements – Fill blanks for proposed equipment and make note if different from listed requirement</u>
PV Module Technology	
Module Efficiency	
Maximum DC System Voltage	600V or 1000V
Sustainable Wind Load	
Resistance to Environmental Damage (water, hail, damage, etc.)	Per UL 1703 requirements
Guaranteed Performance Degradation (25 years)	No more than 3% of maximum power lost at the end of year 1. No greater than 0.7% reduction in power output at the end of each following year up to 25 years.
Operating Temperature Range	
Delivered Module Power Tolerance	Minimum -0W / +3W
UL/IEC Certifications	UL 1703 and IEC 61730 IEC 61215 (mono or poly crystalline) IEC
Inverter Specification	Requirement must meet UL 1741 and IEEE 1547 and operate at -40F
Environmental Ratings	
Maximum Temperature w/ Full Rated Output	
Efficiency	97% Minimum ECE efficiency
Power Factor Rating	
Output Current Harmonics	<3%

1. Racking System

-Describe here

2. Final Equipment Selection for Design Base

<u>Equipment Values</u>	<u>Selection</u>
PV Module Manufacturer Model #	
# of Modules	
Inverter Manufacturer/Model #	
Module Country of Manufacturer/Module Frame Color	
# of Inverters	
Racking System/Model	
Combiner Box Manufacturer/Model #	
MET Station Manufacturer/Model #	
System Array Monitoring	

3. Warranties

- a. Module - Describe
- b. Inverter -Describe
- c. Racking -Describe
- d. Wrap –Describe

4. Maintenance

- a. Please describe planned maintenance proposal including pricing for O&M. Provide pricing estimate for unplanned maintenance with show up fee, hourly rate and total hours expected per year.

5. Exclusions

- a. Note any exclusions or any additional cost items necessary to determine the all in cost that were not incorporated into this proposal.

APPENDIX C
DESCRIPTION OF SYSTEM

Location of Unit:

Net Plant Output: MWh per year

Capacity Factor: _____%

Photovoltaic Modules:

Inverter(s):

Mounting Type and Hardware:

Data Acquisition System:

Warranty: Manufacturers' warranties:

Includes:

Exclusions:

APPENDIX D
MONTHLY AND ANNUAL EXPECTED OUTPUT
(see attached PVSYST Report)

The Monthly Expected Output, and the Annual Expected Output, commencing on the Commercial Operations Date shall be as set forth in the below chart as such information will be updated by the Parties when the PVSYST Report is available.

[Insert actual chart for this Unit]

For purposes of clarity, for each month, the expected hourly output within each clock hour in the month is given by an aggregate number which represents the total expected average output in such month for the given hour of each day in such month. For example, the average expected aggregate output in the 11th hour of each day in April is [-----] kWh. Such amount is derived from statistical data that combines the expected production for each 11th hour for the entire month of April and presents the cumulative sum of the expected 11th hour production for all 30 days in April as the amount shown in the hourly block below.

For each year commencing on the first anniversary of the Commercial Operations Date and at each anniversary date thereafter, the Monthly Expected Output, and the Annual Expected Output, shall be reduced uniformly by reducing each entry below by the multiplying each such entry for the expected production from the prior year by the factor, .995, to express the expected degradation of output with time of approximately 0.5% per year.