The Conti Group
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Conti

November 29th, 2016

The Towns of Bristol and Barrington
10 Court Street
Bristol, RI 02809

Subject: Conti's Proposal Public-Private Partnership for On-Site Solar Projects (Bid #850)

Conti Enterprises (Conti) provides this proposal for Bristol and Barrington, in response to the Request for Proposal (RFP) issued on September 6th, 2015, the subsequent meeting on October 14th, and the site walks on October 27th and 28th.

Conti is a highly experienced developer, financier, EPC contractor, owner, and operator of solar projects with over 200MW of solar installations on their resume. We are also an extremely bankable company with a bonding capacity of $1.2 billion. Conti has been developing and building infrastructure projects for the last 110 years, and our diversified business profile gives us stability and reliability that newer companies lack, which is an important consideration for 20-year projects. Conti has over 200MW in our solar portfolio, with over 74 MW completed in New England. We have a history of providing high quality solar systems that create significant value to our customers through reduced power prices and lease fees.

As a developer, builder, and owner/operator we are ready to complete our proposed solar arrays on time, on budget, and in accordance with the needs of Bristol and Barrington. Conti also has the financial wherewithal and operations experience to ensure the solar arrays will remain valuable and operating assets throughout their useful lives.

Best regards,

Eric K. Millard
Vice President, Solar Development

Bid #850 / November 2016

Bristol and Barrington

Public-Private Partnership for On-Site Solar Projects

Conti Solar

a member of The Conti Group

contisolar.com

Conti Background and Required Information

- **Company Ownership**: Conti Enterprises ("Conti") is privately owned and incorporated in New Jersey. It was incorporated in its current corporate structure in 1989, but the broader Conti Group was founded in 1906.

- **Location of Company Offices**: For this project, Conti will operate out of our satellite office in East Greenwich, Rhode Island.

  Conti's headquarters are in Edison, NJ. Other U.S. offices are in East Greenwich, RI, Fayetteville, NC, New Orleans, LA, Houston, TX, Westboro, MA, and Fresno, CA.

- **Number of Employees**: 86 employees in the Rhode Island area; 538 nationally.

- **Locations from which employees will be assigned:** Employees will be assigned from our offices in Rhode Island, Massachusetts, and New Jersey.

- **Bidder's Point of Contact:**

  Eric Millard
  Vice President, Solar Development
  2045 Lincoln Hwy, Edison, NJ 08817
  emillard@conticorp.com
  732-520-5055

- **Company Background**: Conti is a 110-year old family owned company that develops and builds infrastructure projects. We have been a solar developer, financier, and EPC contractor for 12 years, having completed our first high-profile project for the Atlantic County Utilities Authority in 2005. Our experience and qualifications are summarized in greater detail later in this proposal.

- **Subcontractors**: As an experienced EPC, we have historically self-performed approximately 50% of the labor for our solar projects. We have in-house project developers, engineers, project managers, and construction managers as well as finance and operations & maintenance teams. In addition to our self-perform work, we will also reach out to local subcontractors where appropriate. In general, we look to work with local subcontractors who have specific and relevant experience working in the towns where our projects are located.

- **RI General Contractors License:** Included in Section 7.5.

- **Equipment Specification Sheets**: Included in Section 7.6.

Table of Contents

1. Executive Summary 1

2. An Overview of Conti 2
   - **2.1** Total Projects and Installed MW 3
   - **2.2** Project Implementation Plan 5
   - **2.3** Procurement Plan 8
   - **2.4** Operations and Maintenance 9

3. Relevant Experience 15
   - **3.1** Project Summaries 15
   - **3.2** Project References 22

4. Pricing and Analysis 23
   - **4.1** Minturn Farm Landfill 24
   - **4.1.1** Remote Net Metering Landfill Sub-array 25
   - **4.1.2** RE-Growth Landfill Sub-array 27
   - **4.2** RE-Growth Program for Town Rooftops 28
   - **4.3** Barrington Town Hall Project 29

5. Project Designs 30

6. Roof Replacements 41

7. Assumptions and Clarifications 42
   - **7.1** General 42
   - **7.2** Discount Rate 43
   - **7.3** Rooftop Arrays 43
   - **7.4** Analysis of Town Energy Costs 43

8. Attachments 46
   - **8.1** Attachment A 46
   - **8.2** Attachment B 48
   - **8.3** Attachment C 49
   - **8.4** Attachment D 49
   - **8.5** Rhode Island Contractor's License 50
   - **8.6** PV Specification Sheet 50

9. Project Team 52
   - **9.1** Organizational Chart 52
   - **9.2** Team Resumes 53

List of Figures

Figure 1-1: Conti's Solar PV Project Experience 3
Figure 1-2: Conti Project Execution Approach 5
Figure 1-3: Examples of Equipment 8
Figure 1-4: NJMC 1A Projected vs. Actual kWh 2015 9
Figure 1-5: Conti's Data Monitoring System 10
Figure 1-6: Typical O&M Services for Solar PV Systems 11
Figure 3-1: Project References 22
Figure 4-1: Concept of Energy Savings and Revenue 24
Figure 4-2: PPA Pricing and Energy Savings from Remote Net Metering Sub-array 25
Figure 4-3: Net Metering Credits and Savings 26
Figure 4-4: Percentage Savings 26
Figure 4-5: Lease Payments from RE-Growth Landfill Sub-Array 27
Figure 4-6: Rooftop Capacity and Lease Payments 28
Figure 7-1: G-32 Consumption 44
Figure 7-2: Bristol Facilities 44
Figure 7-3: Barrington Facilities 45
Figure 9-1: Project Organizational Chart 52

1. Executive Summary

Conti is proposing to develop and build 11 solar arrays in Bristol and Barrington which we expect will **create $5.41 million[1] of value for the towns over a 20 year contract term**.

Conti carefully designed our response to this RFP to take advantage of several exciting renewable energy incentives offered for solar projects within Rhode Island. Each of our 11 solar arrays will utilize one or more of the following incentives:

- **Renewable Energy Growth Program** – provides a 20-year feed in tariff with National Grid
- **Public Entity Net Metering Financing Arrangement** – allows offsite generation for onsite consumption for municipalities like Bristol and Barrington
- **Renewable Energy Fund Grant** – provides a state grant for solar arrays built in Rhode Island
- **Renewable Energy Certificates** – provides a tradable certificate that we can sell to electricity providers in the state to fulfill their Renewable Portfolio Standard obligations

We are proposing two separate types of long term contracts with Bristol and Barrington in order for you to extract value from our solar projects.

1. The first contract type is a standard solar Power Purchase Agreement ("PPA") in which we will sell power at a discounted rate to Bristol and Barrington, saving the towns significant money on their energy costs throughout the 20-year PPA term. We will utilize the Public Entity Net Metering Financing Arrangement, Renewable Energy Certificates, and the Renewable Energy Fund Grant to save Bristol and Barrington money on electricity through a PPA with a solar array located on the Minturn Road Landfill. **We estimate our PPA to generate approximately $3.03 million of savings for Bristol and Barrington over 20 years.**
2. The second contract type is a solar Lease Agreement in which we will pay Bristol and Barrington lease payments in exchange for utilizing space on various town-owned facilities for solar. Conti will sell power to National Grid through the Renewable Energy Growth Program and will pass through a large portion of the solar energy sales to the towns through the lease payments throughout the 20 year term of the Lease Agreement. **We estimate our lease payments will generate approximately $2.38 million of value for Bristol and Barrington over 20 years.**

We have provided significantly more detail on our proposed solar arrays in Sections 4 – 7 of this proposal.

[1] Note: all calculations of "value" to Bristol and Barrington are calculated as "net present values" and assume a 3% discount rate, which is discussed in greater detail in Section 6 of this proposal.

2. An Overview of Conti

Founded in 1906, The Conti Group delivers industrial, infrastructure, energy and environmental projects for government and private clients domestically and internationally. Conti Solar, a portfolio company of the Conti Group, is an industry leading developer, financier, builder, owner, and operator of solar PV systems, with **219MW** in our solar portfolio. Our solar resume goes back some 12 years, and builds off of Conti's significant experience in the power, energy, and telecommunications industries. We are an extremely bankable firm with over $350 million in annual revenues and a $1.2 billion bonding capacity.

Conti Solar is particularly active in New England, having built over 75MW and 18 projects in the region, and with offices in Massachusetts and Rhode Island. We will soon begin construction on an 8-MW landfill and ground-mount solar project at the University of Rhode Island, where, in partnership with another developer, we are currently working through the permitting, interconnection, and contracting. Our team is extremely knowledgeable with regards to developing, financing, building, and operating solar projects. We have a full in-house staff of development, engineering, project management, and O&M professionals. All are passionate about renewable energy and delivering quality projects to our customers.

Our expertise is well-suited for the range of projects that Bristol and Barrington are exploring. We are experts in landfill projects, having built 78 MW on closed landfills and other remediated areas. With 10 MW of rooftops and nine prior municipal and educational clients, Conti is also prepared to work with the towns, and meet the high expectations and schedule requirements for facilities that serve the public.

However, Conti is not just a developer or a builder of projects. We currently own over 10MW of operating solar assets, so we approach developing and building projects from a long-term perspective. Our experience in solar maintenance reinforces our commitment to quality installation. We also have a strong balance sheet which enables us to fund the projects entirely ourselves or bring in one or more of our qualified investor partners to participate in the financing of the project. We offer an extremely efficient integrated solution, ultimately resulting in the greatest value creation for our customers. Our resume and focus on project execution also gives our clients the peace of mind that their projects will get done.

The broader Conti Group operates in the Energy, Environmental, Industrial, and Infrastructure industries for public and private customers. The firm is privately held, generates annual **revenues of $350** million, and has a substantial **bonding capacity of $1.5 billion**. Conti's resource base consists of 1,000 project management, engineering, and construction staff and $100 million in construction equipment.

Our financial strength, stability, and technical capability enable us to successfully execute complex projects in a particular timeline providing full financial security to our clients. The company is well known for its client responsiveness and top caliber employees; we have earned dozens of awards for project excellence and safety performance, and we are recognized as a "best place to work".

2.1 Total Projects and Installed MW

Conti's portfolio comprises over 219 MW of solar power generation capacity since 2008. **Figure 1-1** lists 53 solar projects that Conti has completed or currently under construction.

Figure 1-1: Conti's Solar PV Project Experience

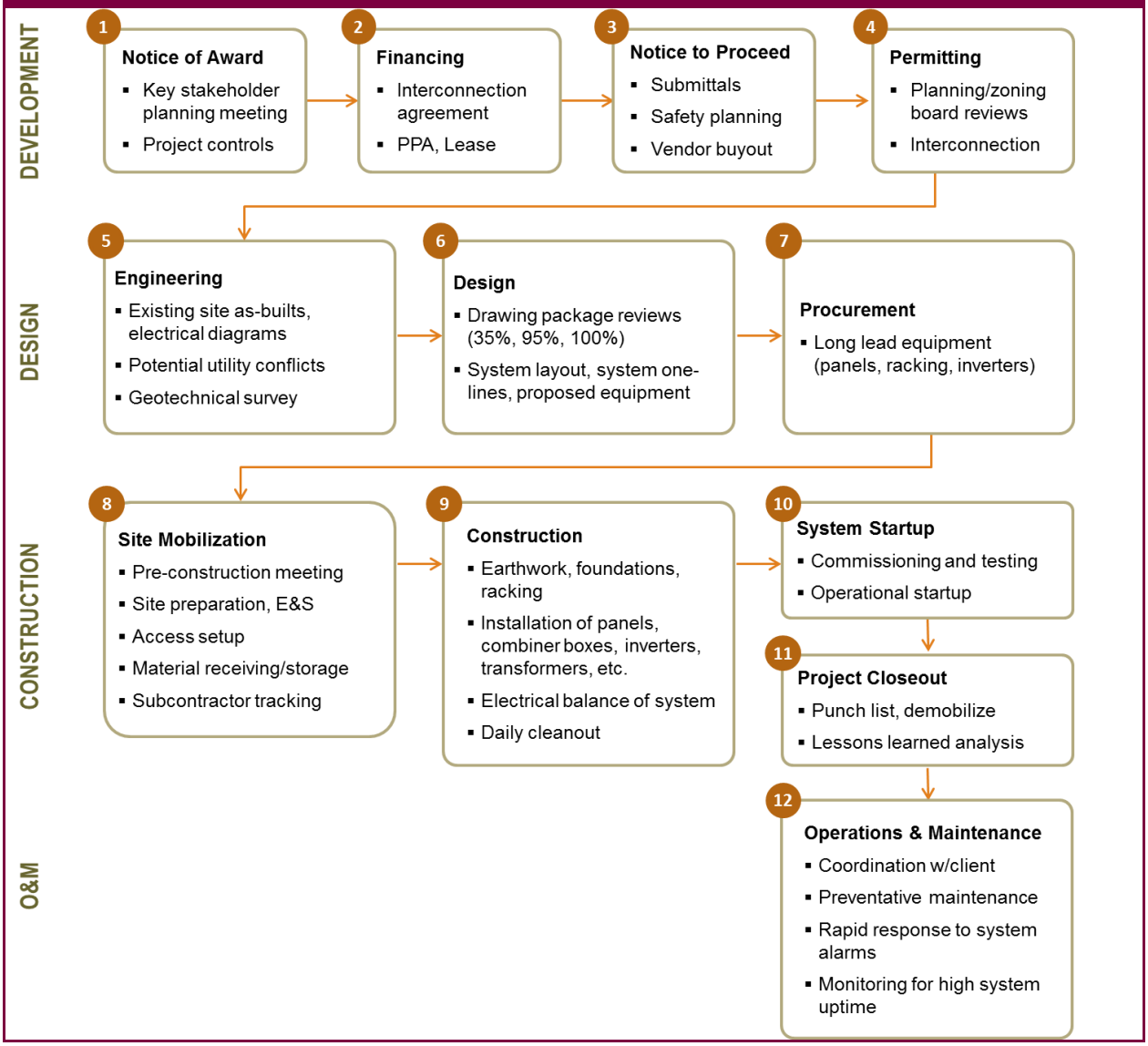
COD	Project	State	MW	Application Type
2016	Brockton	MA	1.6	Roof-Top
2016	Smithsonian	VA	0.6	Ground-Mount
2016	Adesa	MA	4.23	Carport
2016	Pan-Am	MA	6.0	Ground Mount
2016	Mendon	MA	3.8	Ground Mount
2016	Sykesville	MD	5.4	Ground-Mount
2016	Oxford	MA	16.45	Ground-Mount
2016	Leominster	MA	3.1	Roof-Top
2016	Uxbridge	MA	1.3	Ground-Mount
2016	Lee/Lenox	MA	2.8	Landfill
2016	Lakehurst	NJ	13.8	Ground-Mount
2016	Falmouth	MA	6.0	Ground-Mount Landfill
2016	Agawam	MA	2.6	Ground-Mount Landfill
2016	Amesbury	MA	6.0	Ground-Mount Landfill
2016	Tyngsborough	MA	3.5	Ground-Mount Landfill
2016	Norton	MA	2.0	Ground-Mount Landfill
2016	Bridgewater	MA	1.1	Ground-Mount Landfill
2016	Dairyland	CA	4.0	Single-Axis Tracker
2016	Fort Dix Military Base	NJ	16.5	Ground-Mount Landfill
2016	US Military Base, Ramon	Israel	5.0	Ground-Mount
2016	Bernardsville	NJ	3.6	Ground-Mount Landfill
2015	Lumberton	NJ	9.5	Ground Mount
2015	Lafayette, Beaver Run	NJ	9.9	Ground-Mount
2015	Rehoboth Landfill	MA	2.4	Ground Mount Landfill
2015	Perryman	MD	5.4	Ground-Mount
2015	Owens Corning Toledo	OH	2.4	Carport
2015	CCBC	MA	5.1	Carport
2014	Town of Holliston Phase 2	MA	1.0	Ground-Mount
2015	Mansfield Phase 1 Landfill	NJ	6.0	Ground-Mount
2014	Town of Billerica, Shaffer	MA	6.0	Ground Mount Landfill
2014	Town of Holliston Phase 1	MA	3.0	Ground-Mount
2014	PSE&G Parklands Landfill	MA	10.1	Ground Mount Landfill
2014	PSE&G Kinsley Landfill	NJ	11.2	Ground Mount Landfill
2013	Town of Marshfield	MA	4.0	Ground-Mount Landfill
2013	Middlesex County	NJ	6.4	Ground-Mount
2013	Rutgers University	NJ	8.0	Carport

Figure 1-1: Conti's Solar PV Project Experience				
COD	**Project**	**State**	**MW**	**Application Type**
2013	US Navy Base, Barstow	CA	1.2	Single-Axis Trackers
2012	Connell Drive	NJ	1.4	Carport
2012	Stockton College	NJ	0.9	Carport
2012	NRG Energy	NJ	0.5	Carport
2011	Meadowlands 1A Landfill	NJ	3.1	Ground-Mount Landfill
2011	Meadowlands Headquarters	NJ	0.1	Carport
2011	UT Southwestern	TX	0.3	Carport
2011	United Stationers	NJ	3.3	Roof-Top
2010	Morris County	NJ	3.1	Carport, Roof-Top
2010	William Paterson Univ.	NJ	2.7	Carport
2010	Johnson & Johnson	NJ	1.7	Ground-Mount
2010	Atalanta Corporation	NJ	1.2	Roof-Top
2010	NY Jets Training Center	NJ	0.7	Roof-Top
2010	Ft. Dix Army Base	NJ	0.3	Carport
2010	Johnson & Johnson Cordis	NJ	0.1	Roof-Top
2009	Rutgers University	NJ	1.4	Ground-Mount
prior	Jersey Construction	NJ	0.1	Ground-Mount
prior	Atlantic City Utility Auth.	NJ	0.5	Carport
prior	Sartor	NJ	0.1	Roof-top
	Total Capacity MW (dc)		**219**	

2.2 Project Implementation Plan

Conti is ready to develop, design, and build the projects for Bristol and Barrington. **Figure 1-2** shows our approach for project execution.

Figure 1-2: Conti Project Execution Approach



Development

From our experience as developers and EPC contractors, we have seen the obstacles that can delay or derail projects – at all stages. With this experience come a holistic approach and an understanding of the time and attention that each development task requires. Some developers wait until the last minute to make decisions and resolve issues, in an effort to save time and capital. At Conti, our integrated team

allows us to identify obstacles early in the process to effectively manage risk and to maintain our overall project timeline.

- Permitting

Conti has managed the permitting process for over 200 MW of solar projects. Our development team immediately identifies the most time-consuming processes, and the ones that can affect site preparation and clearing. While we have extensive in-house permitting experience, we also work with a stable of environmental and land-use consulting firms who offer regional and functional expertise. Our team manages all aspect of site permitting including: wetlands delineations, threatened and endangered species studies, NEPA studies, planning and zoning board reviews, and stormwater pollution prevention permitting. We also have significant experience working through the post-closure use permitting process for landfills in Rhode Island, Massachusetts, and New Jersey. We are currently working through the post closure use process for landfill solar project located in South County, RI and can draw on that experience to expedite our permitting process for the Minturn Farm Landfill.

- Interconnection

Interconnection can make—or break—a solar project. When evaluating greenfield sites, our development team immediately completes an internal feasibility study for interconnection. Our interconnection review process consists of a pre-feasibility study where we analyze existing infrastructure and perform load flow analyses to “stress-test” the existing infrastructure, helping us to estimate the potential cost of utility upgrades. Once we pass that gate, we initiate the standard interconnection request process with the local utility and/or ISO/RTO. We manage the process internally but also work with several interconnection engineering firms who have utility-specific expertise.

- Financing

Our in-house financial advisors offer decades of experience in the energy industry. Their relationships with lenders and strategic investors allow us to refine our PPA and project finance model in parallel with the other development tasks.

Engineering and Procurement

Designing and constructing infrastructure projects have been the core of Conti’s business for 110 years. This is an advantage for all of our business units, but especially the solar team, which navigates strict timelines to finish project planning.

- Engineering

Conti’s engineers are experts in designing large-scale solar projects. They produce initial designs for planning purposes, and continually refine these plans during the planning process to account for site variables. They communicate daily with our solar project managers, who bring a valuable boots-on-the-ground perspective.

- Procurement

With our solar resume comes a strong working relationship with major solar suppliers. We work with several top vendors to get the lowest pricing and to meet our schedule timeline. Experienced project

managers identify long-lead items immediately and oversee the procurement process while preparing the site plan.

Construction

- Site Preparation

Effective site preparation sets the stage for the rest of the project. Our project managers use standard Conti procedures for arranging equipment, marking our arrays, and preparing inverter work.

- Mounting and Panel Installation

After confirming the layout, Conti will install the mounting equipment and panels. During this period, we will also begin installing the data and weather monitoring equipment.

- Wiring

Our experience as an operations and maintenance provider reinforces our commitment to quality wiring. Loose terminations and poor wire management are the most likely causes of PV malfunctions, and our construction team meticulously checks wiring as the combiner boxes are routed through conduit and connected to inverters.

- Electrical Work

Conti coordinates all electrical work, hook-ups, and interconnections for its projects. The site leadership manages all subcontractors according to our company plan, and works directly with the utility for inspections and interconnections.

2.3 Procurement Plan

Conti procures all of the major equipment for our projects. In 2016 we will procure 100 MW of equipment, and we benefit from excellent supplier relationships and competitive pricing. **Figure 1-3** shows some of our commonly used vendors. We have not selected the equipment to be used for this project, but Conti only uses equipment rated Tier 1 by Bloomberg New Energy Finance. Our proposed equipment has been vetted by potential financiers for this project.

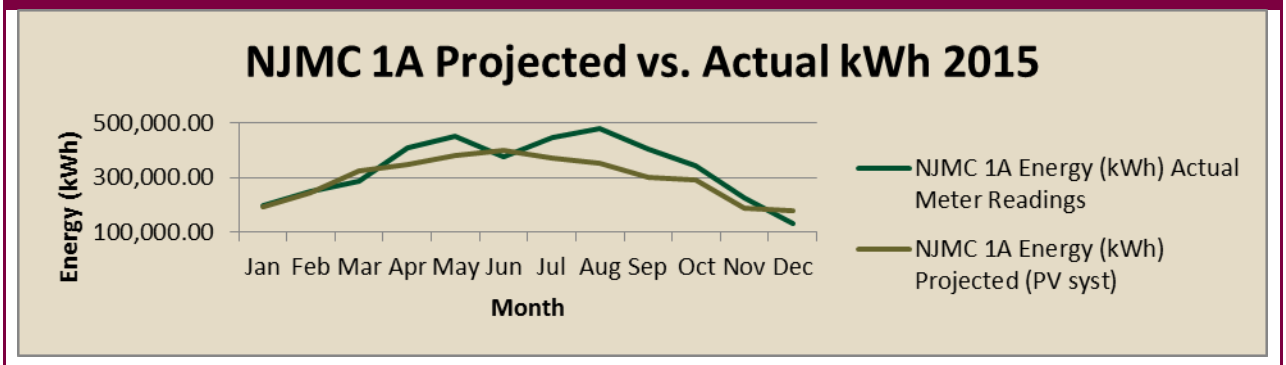
We leverage our large balance sheet to secure trade credit with all Tier 1 equipment manufacturers. These lines of credit limit the amount of upfront cash required to fund procurement. We also have the ability to pre-pay for equipment on our own balance sheet in order to accelerate delivery timelines or secure product.

Figure 1-3: Examples of Equipment

2.4 Operations and Maintenance

Conti will perform all required Operations and Maintenance services required for the projects that we install for Bristol and Barrington. Conti regularly provides Operations and Maintenance services for the solar systems that we build. All installed systems are currently performing at or above expected output levels. Below (**Figure 1-4**) we have included single-year data as an example of a high-level performance review across all systems:

Figure 1-4: NJMC 1A Projected vs. Actual kWh 2015



Conti generally manages systems for several years. In addition to facilities named above, Conti provided long-term operations and maintenance services for the NY Jets Facility, the Atalanta Solar Farm, and the Marshfield Landfill Facility.

In this capacity as an Operations and Maintenance provider, we have learned valuable lessons that we have applied to our development and EPC approach. First, we have learned to meticulously inspect wiring as we install arrays: a high proportion of malfunctions are caused by loose terminations, or poor wire management. Second, we have seen the value of maintaining good relationships with vendors and major suppliers. If defective equipment needs to be replaced, coordination with the supplier is essential, and Conti's long-standing relationships with leading suppliers will be an advantage. And third, we have streamlined our internal monitoring systems for solar facilities. Any malfunction will trigger a redundant alarm system that will reach multiple members of the team, and we keep technicians on standby to troubleshoot systems within 24 hours.

Integrating development, construction, and maintenance makes Conti more reliable in each aspect. Having our own data on system performance drives us to insist on precision in electrical work, and it means that we know the importance of regular and effective maintenance.

Conti will perform regular maintenance of the system throughout its contracted life. We employ qualified technicians who will monitor the system and will respond to any alerts that come up 24 hours per day / 7 days per week. **Figure 1-5** below is a screens shot of our centralized data monitoring system which we use to monitor all of our projects.

Figure 1-5: Conti's Data Monitoring System

The PV system will be monitored 24/7 through internet connectivity to observe overall system performance. In the event of a system or sub-system issue, an electronic alert is sent via e-mail to the operator. Once the alert is received, we will determine the extent of the problem and resolve the issue from a remote location. If the problem cannot be addressed in this manner, our maintenance staff will be contacted and dispatched to the site within 24 hours where a solar technician will troubleshoot the system, isolate the problem area, and implement a solution.

Data Monitoring Station for Bristol and Barrington

Conti understands that the system performance will be of interest to Bristol and Barrington. We offer to install a data monitoring station for each town in an identified location. The stations will allow the towns to view real-time data on energy production, environmental benefits, and other relevant data. We also offer to have Conti's project manager give a presentation on the technology, production, and monitoring of the system.

Figure 1-6 below provides a sample operations and maintenance (O&M) scope of services for typically done for solar PV projects.

Figure 1-6: Typical O&M Services for Solar PV Systems

Services	Scope
Monitoring System	Operator will provide labor, hardware and software to monitor System in order to respond and take action to maximize System performance.
Notifications	Operator will promptly notify Operator Representative per the Communication Plan of System (a) faults, (b) performance 10% below expected performance, (c) observed performance warnings or trends which may indicate developing performance problems.
Reports	Operator will provide reports containing the information as agreed by the Parties.
General Requests for System Information	System Owner may make reasonable requests and Operator will provide additional System information.
Licenses and Operating Permits	Operator will obtain and maintain required licenses and permits to operate and maintain the System.

Field Inspection	Operator will perform a minimum of one (1) field inspection per Contract Year. The field inspection will include:
	▪ PV Panel Condition
	  ○ Inspect for cleanliness, cracked/chipped/scratched/ shattered panels, fading/discoloration, burn marks, seal condition, frame damage or rust
	▪ PV Mounting Structure
	  ○ Inspect mounts and mounting structures (loose panels, loose rack,/clips missing hardware, rusted bolts, flashing issues, ballast condition, rack anchor condition)
	▪ PV Array Ventilation
	  ○ Inspect conditions under panels, remove of any large debris or pests; visual check to ensure maximum ventilation under panels
	▪ PV System Foundations
	  ○ Ground mount arrays (visual inspection of grounds and vegetation, identify issues related to mud, water pooling, soil erosion)
	▪ Balance of System
	  ○ Inspect conduit runs (separated/cracked conduits, misaligned wire runs)
	  ○ Inspect panel interconnectivity and string lines (wire/cable wear, wire fading, chewed wire due to pests, identify loose/detached wires)
	  ○ Inspect junction/combiner enclosure(s) condition (seals, rust, damage, locks)
	  ○ Inspect electrical equipment enclosure(s) (seals, rust, damage, door condition, locks, equipment pad(s))
	▪ Inverter(s)
	  ○ Inspect inverter structure(s) and enclosure(s) (seals, rust, damage, door condition, switch/handle condition, locks)
	  ○ Inspect inverter equipment pad(s) (cracks, base damage, soil erosion)
	▪ Data Acquisition System (DAS)
	  ○ Weather stations condition (alignment of irradiance sensor, condition of wind and temperature meters)
	  ○ DAS device condition (screen, seals, rust, damage)
	  ○ Shading Conditions
	  ○ Visual inspection to identify any shading issues, preventive care if shading caused by nearby vegetation)
	▪ Vegetation/Pest Conditions
	  ○ Vegetation management (inspection for vegetation issues, removal of any weeds, vines, tree branches or other plants/trees blocking panels/system, grass mowing and control)

Figure 1-6: Typical O&M Services for Solar PV Systems	
Services	**Scope**
	○ Pest Control (insects, bird nests, squirrels, spider nests, etc.) ▪ System Security ○ Visually inspect fence line or confinement structures for wear, damage, breach, vandalism, or other problems ○ Visually inspect any electronic surveillance equipment (cameras, alarms, etc) and identify if operating ○ Check condition of any locks, chains or other protection measures preventing unauthorized access to the system
Maintenance	Operator will perform all maintenance activities in accordance with the equipment manufacturer recommendations.
System Cleaning	Operator will monitor System and if required recommend System cleaning in accordance with the equipment manufacturer recommendations and industry standards; Operator and System Owner will agree to timing of cleaning to minimize disruption to Site Owner and System Output.
Troubleshooting and Repair of System	Operator will promptly perform troubleshooting and repair of System in order to maximize System performance.
Troubleshooting and Repair of Site	Operator will promptly perform troubleshooting and repair of Site caused by System design, installation or maintenance in order to maximize System performance.
Warranty	Operator will perform all activities required to process all Equipment warranties.
Reporting	A.1.1 System Event Report After an automated System event notification, the Operator will provide a brief report via email to the System Owner explaining the event, activities, and resolution of the System event. A.1.2 System Performance Report Quarterly Reports will be provided to System Owner. A.1.3 Field Inspection / Maintenance Report Upon completion of inspection, troubleshooting and maintenance activities, a report will be provided to the System Owner providing evidence of activities related to the site visit, repairs and maintenance performed on the System.
Services and Maintenance	Preventative maintenance will be carried out two (2) to four (4) times per year, depending on the site and weather conditions.
Additional Responsibilities (General)	1. Vegetation control to maintain optimal performance of PV system and visual perception of the site 2. Mowing of grassy areas as necessary and applicable 3. Topping up of gravel areas with matching gravel as necessary 4. Pruning of trees/bushes on property, or overhang property that cause shading of the PV panels or potential damage to fencing/equipment 5. Check fence/gate security; Operator to carry out repair/replacement of fence and security systems as appropriate 6. Visually inspect all terminations for corrosion/tightness 7. Re-torque all power terminations/connections associated with the system, e.g., DC combiner boxes, DC and AC disconnects, surge arrestors, inverters, PV modules, transformers, etc. 8. Test surge arrestor operation 9. Test ground continuity, lightning protection and overall system safety, and correct any unsafe or abnormal issues 10. Check mechanical and structural integrity of the system, and correct any issues where deviation from Final Acceptance has occurred
String Level Testing	1. Perform testing to measure the open circuit voltage (Voc) and operating current of each string in the system 2. Analyze and document any anomalies that effect system performance and propose correct actions if necessary

Figure 1-6: Typical O&M Services for Solar PV Systems	
Services	**Scope**
	3. Perform string level IV Curve tracing with a minimum of 400 w/m2 irradiance 4. Analyze and document any anomalies that effect system performance and propose correct actions if necessary
Additional Responsibilities (PV Modules)	1. As applicable and necessary, clean solar panels once or twice per year or as needed, depending on deposits on panels 2. High pressure sprays may be used; Operator to provide own water and electrical supply 3. Snow/ice on panels should not be cleared
Additional Responsibilities (Inverters & Associated Equipment)	1. Check housing for dust/water ingress 2. Conduct preventative maintenance in accordance with manufacturer specifications 3. Clean and vacuum enclosure, vents and heat sink / remove any identifiable debris and clean any accumulation of dust 4. Change air filters according to manufacturer specifications (filters are billed at cost, installation is included in O&M fees) 5. Check fuses and switchboards (visually inspect for signs of corrosion/burning of components) 6. Check wiring (visually inspect for breaks, deterioration or signs of corrosion/burning, check cable wire protection)
Additional Responsibilities (Transformer)	1. Operator will be responsible for attending site to check the terminations, etc. for the main transformer 2. Any alarms raised by the public or the DAS should be immediately forwarded directly to Operator for action
Additional Responsibilities (DAS & Weather Station)	1. Visually inspect and clean weather station as appropriate 2. Check calibration of weather station procedures
Additional Responsibilities (Operation of System)	1. Sub-array zones are to be monitored and their power production tracked the monitoring system shall detect any power discrepancies in the sub-array zone. For example, permanent partial shading or blown string fuses shall be indicated on the sub-array monitoring system. 2. The monitoring system shall have built-in algorithms to detect the standard trends of one sub-array against another, and when this trend is broken, depending on the magnitude, will trigger an alarm. Detection of individual module problems is not a requirement. 3. Detection and alarms notification of critical failures of the equipment or outside issues such as ground faults and fluctuations on the electrical grid shall be captured and reported. 4. Attend site to carry out a diagnosis of any alarm raised by software/monitoring system or 'phone call from Lessee or member of the public indicating that there is, or may soon be, a problem at the site 5. Within twenty-four 24 hours of arrival on site, the fault shall have been diagnosed and a replacement part ordered if required. Once the new part has been delivered, it shall be installed and the system re-commissioned within seventy-two (72) hours. 6. If no new part is required, the system shall be repaired and re-commissioned within seventy-two (72) hours of fault diagnosis. 7. Once the system is fully re-commissioned and operational, a full report shall be written by the Operator, showing, as a minimum: a. Date/time fault reported b. Method of reporting fault (type of system, or personnel details) c. Nature of fault reported d. Nature of fault diagnosed and repaired e. Times of arrival at, and departure from, site

Figure 1-6: Typical O&M Services for Solar PV Systems	
Services	**Scope**
	f. Replacement equipment required g. Time to repair on site (start/finish times)

3. Relevant Experience

Conti has excelled in developing and constructing landfill and rooftop projects, and serving municipal and educational institutions. In addition to our upcoming landfill project for the University of Rhode Island, we have completed 14 projects and 84 MW on landfills, and understand the special considerations necessary. In 2010, we completed a project for Morris County, NJ that involved 16 different arrays at town sites. Conti managed roof replacements and worked around the schedules of the schools and town services, completing all construction within six months.

3.1 Project Summaries

Below we have included summaries for relevant projects, as well as contact information for our references.

207

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Rehoboth Solar Landfill
Rehoboth, MA

The completed array generates nearly $2 million in revenue for Rehoboth over a 20-year period via a power purchasing agreement.

In the wake of a home-rule petition passed by the Massachusetts Legislature and signed into law in mid-2014 which allowed the Town of Rehoboth to collect and reallocate funds generated from local solar farms into the town's capital improvements, Rehoboth representatives and NRG Renew, LLC contracted Conti to design and build a solar farm on the Rehoboth Landfill. The new landfill would help town and state officials capitalize on the new legislation to raise funds for badly needed community infrastructure upgrades, including repairs to the Town Hall and police station.

Conti designed, engineered, procured and installed the 2.4 MW solar array on the landfill near an operational transfer station. With slopes of varying degrees and topping out at 13%, the topography of the Rehoboth landfill posed significant challenges. Conti worked with the landscape by developing project designs early on and redesigning when necessary. Conti also used an innovative Game Change racking system that allowed the team to attach solar panels to the landfill without penetrating it by using concrete blocks over posts. By working closely with NRG Renew, and local vendors and subcontractors, the team was able to complete the project on budget and schedule in just three months with minimal rework and redesign needed.

Project Details	
Client	BWC Swan Pond River LLC, c/o NRG Renew, LLC
Contract Type	Firm Fixed Price
Value	$5M
COD	12/2015
Type of Work	Energy

Scope of Work
- *PV Modules: RECOM*
- *Inverters: Eaton*
- *Mounting System: Game Change*
- *Data Acquisition System: Noveda*
- *Expected Production: 2.4 MW*

Once complete, Conti connected the array directly to the National Grid.

As Representative Steven Howitt stated in a statement to the press, this new solar array and others like it presents "a smart and prudent way of separating some of the money [from solar energy creation] and putting it from the solar farms into a separate fund for capital improvement."

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222

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Barrett Street 16.5 MW Ground Mount Array
Oxford, MA

Among the largest solar projects in Massachusetts, Conti completed this project on time, after dealing with challenging site conditions and complex technical requirements.

As one of the foremost solar energy developers in the eastern US, Blue Wave Capital worked for several years to develop the highly complex Barrett Street Project. BlueWave contracted Conti to clear the site and engineer and construct the installation.

Conti worked on 12 uniquely-shaped mini-arrays spread out in between wetlands across the 130-acre site. This presented logistical challenges for the project team since there was only one roadway in and out of the site. The team kept the project on schedule and budget despite these obstacles by closely managing trucking traffic and working on multiple arrays concurrently.

Project Details	
Client	Blue Wave Capital
Contract Type	Fixed Price EPC
Value	Confidential
COD	10/2016
Type of Work	Energy

Scope of Work

- *PV Modules:* LG Electronic 340 Watt, Canadian solar 320 Watt, and SolarWorld 240 Watt
- *Inverters:* SMA and SolarEdge String Inverters
- *Mounting System:* RBI Solar
- *Data Acquisition System:* Locus
- *Expected Production:* 16.5 MW

Conti managed about 230 personnel at peak, and 20 subcontractors throughout the project, including electrical engineers, demolition specialists, and Conti's long-time racking and photovoltaic (PV) module supplier and installer, RBI Solar. During construction, the team made sure that all work was performed in accordance with the specifications of Blue Wave Capital and the Town of Oxford, whose Conservation Commission, Building Inspection Department, and Electrical Inspection Department, as well as a third party Oxford inspector, monitored the project regularly.

Conti also cleared all 130 acres of trees and vegetation, constructed access roads and culverts and swales, and performed general site grading, boring pit drilling, and structural demolitions.

Once construction was complete, Conti tied the PV system into the existing National Grid distribution system. Blue Wave Capital will own and operate the array for 20 to 25 years, paving the way for more solar projects around the country. One of the largest projects in Massachusetts, Conti worked through challenging site conditions with a very aggressive schedule to complete this project on time.

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Morris County
3.1 MW Car-port
Morris County, NJ

Conti succeeded with the completion of the project even though it was a challenge to manage all 16 locations simultaneously.

This municipal solar project was a pilot program that later became known as the Morris County Model and has since been repeated by other municipalities in the region. It displays how public and private sectors can work together to deploy solar that is profitable for the developer and county. The program included 16 county buildings including several schools, county ice rink, town building, and DPW facilities. With no upfront investment from the county the developer, Tioga Energy, contracted with Conti to build 16 solar systems on the various county buildings and in return the county would pay for the systems through a 20-year power purchase agreement.

Conti performed as the EPC contractor for the project. The project was spread over 16 different locations in the county which was a challenge to manage them all simultaneously. Conti succeeded with their on-time delivery of the project with no significant change orders. Conti also value engineered the roof replacement costs of some systems saving the project a significant amount of money.

Project Details	
Client	Tioga Energy
Contract Type	Turnkey EPC
Value	Confidential
COD	12/2010
Type of Work	Energy

Scope of Work
- *PV Modules:* Yingli 230 Watt
- *Inverters:* PV Power
- *Mounting System:* Panel Claw and Baja Carport
- *Data Acquisition System:* National Semiconductor
- *System Size:* 3.1 MW

The individual sites varied in size from just 10kw up to the 1MW carport located at the Mennen Ice Rink. When school was in session Conti worked closely with faculty to minimize impact to the students. This involved performing the highest risk, loudest, and most intrusive tasks on off hours. Also, Conti led learning sessions for interested students in how solar works.

Later projects following the Morris Model faced the same challenges that Conti had on this project with less success. The coordination effort of managing the facilities unique needs and spread out nature of the project proved Conti's capabilities to deliver on complex projects. Additionally, Conti managed the re-roofing operations for the projects, including a value engineering proposal that saved the client significant time and money, and field engineering alternate foundations for the Mennen carport when undocumented obstacles were found in the foundation area.

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210

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Roof Mounted 3.2MW Solar PV
Leominster, MA

This large solar PV system covers over 13 acres of roof top.

One of the largest rooftop solar PV arrays in New England, this system is a net metering distributed generation project for a manufacturing facility in Leominster, MA, to provide an offset cost to the owner's electrical usage.

Conti performed EPC services for this 3.2 MW DC roof-mounted photovoltaic (PV) solar array located at 25 Tucker Drive, Leominster in MA. This distributed generation solar array connects to the existing National Grid distribution system. Conti entered into an EPC agreement with SolSystems to obtain the necessary permitting, and then design and construct the solar PV array including necessary electrical and coordination work to interconnect with the local utility. Conti transferred and assembled more than 10,000 solar panels on the manufacturing facility's large rooftop footprint of 515,540 square feet (over 13 acres).

Project Details	
Client	SolSystems
Contract Type	Fixed Price EPC
Value	Confidential
COD	09/2016
Type of System	Rooftop

Scope of Work
- *Modules: JA Solar 315-320W*
- *Mounting System: Panel Claw Bear III*
- *Inverters: SMA 630kW Central*
- *Data Acquisition System: LOCUS*
- *System Size: 3.2 MW*

This project presented several challenges to the Conti team, including modifying interconnection designs halfway through the project, working with space restrictions, existing HVAC equipment, and the structural weight limitations of the roof. Through detailed design and planning, Conti met the size and production requirements while minimizing the amount of material needed.

The project was successfully installed and commissioned in less than 4 months from mobilization.

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174

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1.2 MW Solar PV System - NAVFAC SW Marine Corps Logistics Base

Barstow, CA

"This solar project is an important step toward our base goal of net zero power from the grid,"
- Col. Dan Ermer, Marine Corps Logistics Base Barstow Commanding Officer

Operating at net zero power from the grid was a significant challenge that faced the U.S. Marine Corps Logistics Base in the Barstow desert in the early 2010s. To address this, the Naval Facilities Engineering Command (NAVFAC) developed the first project to use special legislation for a long-term power purchase agreement (PPA) for the United States Marine Corps. The legislation, titled "Contracts for energy or fuel for military installations" was Congress enacted in 1982 and requires no upfront capital investment from the government.

Conti Solar engineered, procured and constructed a 1.2 MW solar photovoltaic (PV) system for NAVFAC Southwest, Marine Corps Logistics Base (MCLB) in Barstow, CA. This was a project in the first group that NAVFAC commissioned, which required a change in the Federal Acquisition Regulations to accommodate solar work and allow the project to be financed. Conti worked with NAVFAC from the outset to develop the necessary changes, making this project and all subsequent solar work with NAVFAC possible. The array consists of 4,452 photovoltaic solar panels at two separate locations on the base, which generated 2.5 million kWh of electricity in the first year of operation. At the Yermo site, the 771.68-MW facility consists of 2,968 modules in 212 14-panel DC electrical strings feeding 2x Advanced Energy 333kW inverters. Conti designers developed a solution to overcome the 1 MW cap on net metering by installing relays to limit production of the PV System. The Nebo system has a maximum DC capacity of 386-kW and uses 1,484 modules in 14 panel DC electrical strings to feed 1 Advanced Energy 333kW solar inverter.

Project Details	
Client	NAVFAC Southwest
Contract Type	Fixed Price
Value	$4.6M
Duration	05/2012 – 10/2012
Type of Work	Energy

Scope of Work

- *PV Modules: 4,452 photovoltaic solar panels*
- *Inverters: Yingli Panda 260 Wp and Advanced Energy 333kW*
- *Mounting System: Single-axis tracking system*
- *Data Acquisition System: Noveda*
- *Expected Production: 1.2 MW*
- *PPA*

Under the PPA, Conti owns the project and sells the power to the Marine Base. The project supplies about 25% of the base's electricity requirements and is expected to provide the Marine Corps with $3.9 million in energy savings over the 20-year term of the PPA. The project offsets the release of 18,000 tons of greenhouse gas, which is the equivalent of planting 28,000 trees and growing them for ten years.

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190

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Beaver Run 9.9MW Solar PV System
Lafayette, NJ

The team brought a long-awaited project to successful close after taking over for a previous developer.

Conti and 1906 Advisors completed the development, financing and construction of the much-anticipated 9.9 MW ground-mounted Beaver Run photovoltaic (PV) solar farm on 36 acres in Lafayette, New Jersey. The project qualifies for Solar Renewable Energy Credits (SRECs) as part of the state's mandated Renewable Portfolio Standard and generates nearly 13 million kilowatt hours of clean electricity, enough to power approximately 1,500 homes in New Jersey per year.

Conti Solar designed and constructed the 9.9 MW project in record time, achieving mechanical completion in less than two months from Notice to Proceed, while Vitruvio structured the acquisition of the project from the mid-stage developer and was heavily involved in successfully finishing the late-stage development phase of the project.

Project Details	
Client	Shotco Energy, LLC
Contract Type	Fixed Price
Duration	03/2015 – 09/2015
Type of Work	**Energy**

Scope of Work:

- *PV Modules: Canadian Solar CS6X-315P*
- *Inverters: ABB Ultra 1500 and Ultra 1100*
- *Mounting System: Fixed-tilt Ground Mounted RBI Solar Racking System*
- *Data Acquisition System: Noveda*
- *Expected Production: 12.7M kWh*

Conti and 1906 Advisors arranged to finance the solar farm as a merchant facility, relying on short term SREC contracts and the project's ability to sell power into the PJM Interconnection wholesale power market. The deal capitalized on the solar market swing, maximizing the near term value of solar attributes while keeping the SREC upside value. Financial close was achieved in 60 days.

With the project completed, the Beaver Run solar PV array is interconnected to the Jersey Central Power & Light Company (JCP&L) distribution system and transmits electricity to 1.1 million homes and businesses in 13 counties in central and northern New Jersey. Conti is currently operating and maintaining the Beaver Run renewable energy system.

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3.2 Project References

A critical measure of success is the extent to which our customers were satisfied with our performance on each of our projects. Conti's business practices focus on delivering well-managed jobs, working with our clients and subcontractors in a cooperative and responsive manner, solving problems quickly and effectively and getting the job done safely. Satisfied customers are the cornerstone of our success and reflect our credo: **Done once. Done right.** As requested, we have provided references in **Figure 3-1** below.

Figure 3-1: Project References

Project Name	Contact Name & Phone Number	Project Size (DC)	Price	Date of Commissioning
Rehoboth Landfill Solar	Nick Benjamin NRG (415) 265-7583	2.4 MW	$5M	12/2015
Barrett Street Solar	Aidan Foley Blue Wave Capital (617) 209-3122	16.5 MW	Confidential	10/2016
Leominster Solar	Jack Hackman WGL Energy (571) 318-3723	3.2MW	Confidential	09/2016
Morris County Solar	Douglas Pechanec West Morris School District (908) 879-6404	3.1 MW	Confidential	12/2010
Marine Corps Logistics Base Barstow Solar	Russell Dominy, NAVFAC SW (805) 982-1006	1.2 MW	$4.6M	10/2012
Beaver Run Solar	Chris Diaz Seminole Financial Services (727) 460-0578	9.9 MW	$21M	09/2015

4. Pricing and Analysis

The available sites, state tariffs and incentives, and Bristol and Barrington's commitment to sustainable energy provides an excellent opportunity for long-term energy savings through solar projects. As a leading solar developer and contractor, Conti is an expert in landfill and rooftop projects, and we have installed 33 MW for municipal and educational clients.

We propose to develop, build, own, and operate the following projects for the Bristol and Barrington:

Bristol

- Minturn Farm Landfill
- Bristol Town Hall
- Bristol Composting Building
- Quinta Gamelin Community Center
- Mt. Hope High School

Barrington

- Barrington Town Hall
- Barrington High School
- Hampden Meadows
- Nayatt Elementary
- Primrose Hill
- Sowams Elementary

As discussed in the Executive Summary, Conti will make use of both municipal "remote net metering" (a.k.a. Public Entity Net Metering Finance Arrangement) and National Grid's Renewable Energy Growth ("RE-Growth") Program to provide value to the town. Our goals are wholly aligned with those of the towns: we want to produce as much clean energy as possible, and to pass as much value of the solar energy sales on to the towns as possible.

Each program creates value for the town in a different way. Remote Net Metering allows a large offsite project (up to 10 MW) to offset municipal meters, while the RE-Growth Program allows us to sell power to National Grid at a fixed price for a 20-year term. These factors shape our proposal for the towns:

- Remote Net Metering will provide the greatest benefit to towns by utilizing **large offsite projects** to offset several municipal meters. It's important to offset meters which have higher costs of power (National Grid tariffs C-06 and G-02 are ideal). Also, a **single offsite project can serve multiple municipalities**.
- The RE-Growth Program pays higher electricity rates for smaller projects, which compensates for higher costs of construction. This makes the RE-Growth Program ideal for projects located on smaller rooftops (less than 999kW) or for projects located at facilities with very low cost of power (National Grid tariff G-32, for example).
- Rhode Island allows for collocation of a Remote Net Metered project and a RE-Growth project on the same parcel as long as each project has its own unique utility meter, which Conti will provide.

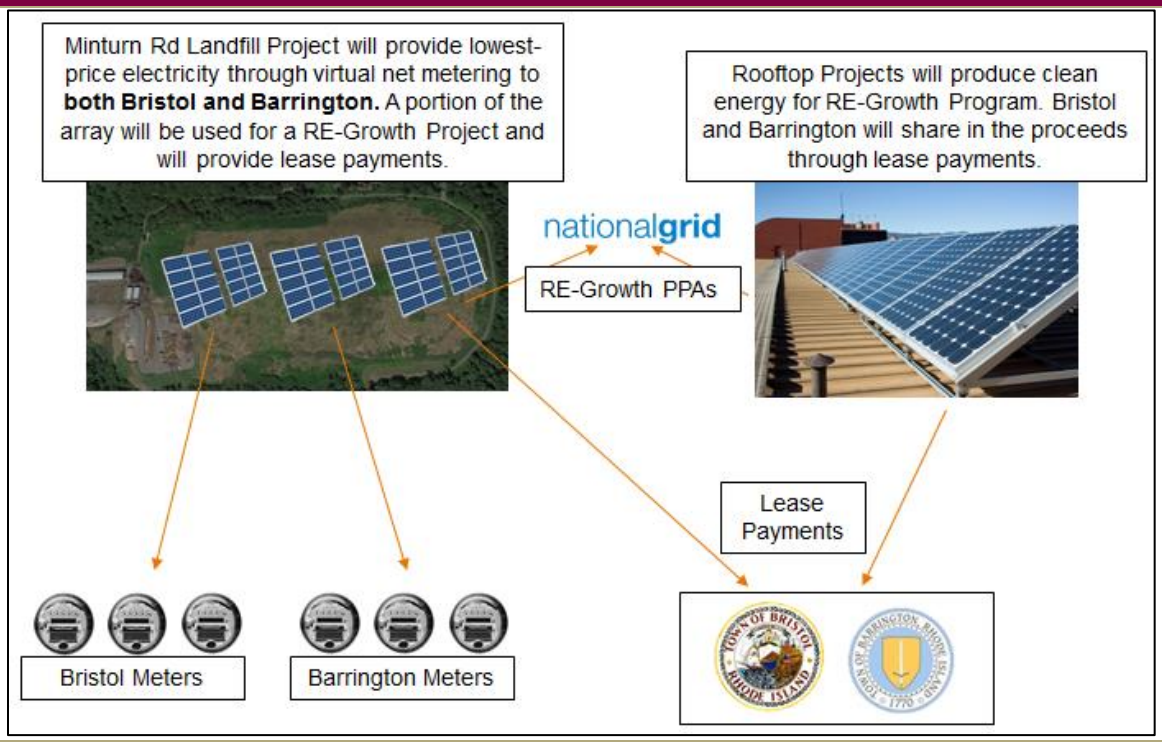
To provide the greatest value to the towns, Conti proposes to build a 6.5MW solar array on Minturn Farm Landfill. A large portion of the landfill array (approximately 4.4MW) will offset town meters through the Remote Net Metering Program, beginning with the higher value C-06 and then G-02 meters. We will enter into a 20-year Power Purchase Agreement with the towns at a deep discount to the current cost of energy. Based on the utility data provided with the RFP, we believe that this project can offset all small and general C&I meters for both Bristol and Barrington. The only additional requirement for the project to serve two towns is two separate meters on the project, which Conti will provide. The

towns will achieve savings of at least $135,000 in the first year through this 20-year Power Purchase Agreement, and we expect that this savings will increase into the future.

A smaller portion of the landfill array (approximately 2.1MW), will be bid into the RE-Growth Program, and the towns will receive regular Lease Payments as compensation. These Lease Payments are the most effective way of passing energy savings along to the towns for the towns' large commercial meters, utilizing National Grid's G-32 tariff. We propose $66,000 of annual lease payments to the towns for the RE-Growth portion of the landfill.

Finally, we plan to build solar on the 10 best rooftops of buildings in Bristol and Barrington. These rooftop systems will be providing clean power to each of the buildings, but we will be selling power to National Grid through the RE Growth Program. We will pass along energy savings to the towns through regular Lease Payments, which is the most efficient way of monetizing solar on these smaller rooftop systems. We propose $93,000 of annual Lease Payments to the towns for the rooftop arrays. **Figure 4-1** shows the concept of our use of town sites.

Figure 4-1: Concept of Energy Savings and Revenue



4.1 Minturn Farm Landfill

We plan to build a 6.5-MW (DC) project on the Minturn Farm Landfill. This will produce approximately 8.5 million kWh annually. As discussed previously, the landfill will be separated into two sub-arrays: the Remote Net Metering Landfill Sub-array and the RE Growth Landfill Sub-array.

4.1.1 Remote Net Metering Landfill Sub-array

This portion of the landfill array will be approximately 4.4MW and will offset both Bristol and Barrington's electricity usage. We will sell all of the power produced by this sub-array to the towns at a price of $0.084/kWh, escalating at 2% per year for 20 years. **Figure 4-2** shows our PPA pricing and energy savings that we offer to both towns throughout the 20 year Power Purchase Agreement term. We are also able to sell Rhode Island Renewable Energy Credits and we will qualify for Rhode Island's Renewable Energy Fund Grant for solar facilities – both of these incentives have been factored into our PPA pricing.

Figure 4-2: PPA Pricing and Energy Savings from Remote Net Metering Sub-array

Year	PPA Rate (per kilowatt-hour)	Forecasted Grid Cost (per kilowatt-hour)	Percent Discount to Grid	Annual Savings
2017	$0.0840	$0.1050	20.0%	$122,037
2018	$0.0857	$0.1082	20.8%	$129,927
2019	$0.0874	$0.1114	21.5%	$138,085
2020	$0.0891	$0.1147	22.3%	$146,519
2021	$0.0909	$0.1182	23.1%	$155,238
2022	$0.0927	$0.1217	23.8%	$164,249
2023	$0.0946	$0.1254	24.5%	$173,560
2024	$0.0965	$0.1291	25.3%	$183,181
2025	$0.0984	$0.1330	26.0%	$193,120
2026	$0.1004	$0.1370	26.7%	$203,386
2027	$0.1024	$0.1411	27.4%	$213,989
2028	$0.1044	$0.1453	28.1%	$224,938
2029	$0.1065	$0.1497	28.8%	$236,243
2030	$0.1087	$0.1542	29.5%	$247,914
2031	$0.1108	$0.1588	30.2%	$259,961
2032	$0.1131	$0.1636	30.9%	$272,396
2033	$0.1153	$0.1685	31.6%	$285,228
2034	$0.1176	$0.1735	32.2%	$298,470
2035	$0.1200	$0.1788	32.9%	$312,132
2036	$0.1224	$0.1841	33.5%	$326,228
NPV of Savings				**$3,034,289**

Our Power Purchase Agreement offer will provide considerable energy savings for the towns. These savings are measured by comparing the PPA rate to the "net metering credits", which is the rate at which the utility values the energy produced. The "net metering credits" associated with renewable projects are calculated as:

$$\underline{\text{Net Metering Credit}} = \text{Standard Offer} + \text{Distribution kWh rate} + \text{Transmission kWh rate} + \text{Transition kWh rate}$$

Table 3-3 shows the value of "net metering credits" for the different types of meters in Bristol and Barrington.

Figure 4-3: Net Metering Credits and Savings

Type of Service	Standard Offer	Distribution kWh	Transmission kWh	Transition kWh	Net Metering Credits
C-06	$ 0.08396	$ 0.03253	$ 0.02566	$ (0.00058)	$ 0.14157
G-02	$ 0.08396	$ 0.00468	$ 0.01068	$ (0.00058)	$ 0.09874
G-32	$ 0.04626	$ 0.00551	$ 0.01047	$ (0.00058)	$ 0.06166

As shown, the towns derive the greatest value from offsetting C-06 meters. But at $0.084/kWh, our landfill project will provide significant savings for both C-06 and G-02 meters. It is important to note that it does not benefit the towns to offset the G-32 meters through remote net metering because the "net metering credit" is less than the PPA rate. **Table 4-4** shows the percentage savings for the C-06 and G-02 meters, and also our compared to our estimated "weighted average" for the towns. We estimated this "weighted average" for both towns at $0.105/kWh. More details on this estimate are included in Section 7.4.

Because the G-32 meters are not being offset by the Remote Net Metering Landfill Sub-array, roughly one-third of the landfill array's production will not be used for net metering. We plan to bid this portion of the project into the RE-Growth Program, and share the proceeds with the town. See section 4.1.2 for more details.

Figure 4-4: Percentage Savings

PPA Rate Offered by Conti	Discount from C-06 Net Metering Credit ($0.14157/kWh)	Discount from G-02 Net Metering Credit ($0.09874/kWh)	Discount from Approximated "Weighted Average" ($0.105/kWh)
$0.084/kWh	40.7%	14.9%	20.0%

4.1.2 RE-Growth Landfill Sub-array

This portion of the landfill will be approximately 2.1MWdc and will be separately metered from the Remote Net Metering Landfill Sub-array. We will enter the project into the 2017 RE-Growth auction for large-solar, and expect to enter into a 20 year fixed price power purchase agreement with National Grid. We will pass a large portion of the energy sales on to Bristol and Barrington in the form of Lease Payments. We are offering Lease Payments for the RE-Growth Landfill Sub-Array of $66,000 per year for 20 years through a long-term Lease Agreement. **Figure 4-4** shows the proposed Lease Payments and total value of these Lease Payments to Bristol and Barrington for the 20 year term.

Figure 4-5: Lease Payments from RE-Growth Landfill Sub-Array

Year	Annual Lease Payment for Landfill Sub-Array
2017	$66,000
2018	$66,000
2019	$66,000
2020	$66,000
2021	$66,000
2022	$66,000
2023	$66,000
2024	$66,000
2025	$66,000
2026	$66,000
2027	$66,000
2028	$66,000
2029	$66,000
2030	$66,000
2031	$66,000
2032	$66,000
2033	$66,000
2034	$66,000
2035	$66,000
2036	$66,000
NPV of 20-Year Savings	**$981,913**

4.2 RE-Growth Program for Town Rooftops

Conti proposes to build solar arrays on 10 rooftops in Bristol and Barrington and enter those projects into the RE-Growth Program. We will share the proceeds of the RE-Growth projects with Bristol and Barrington, offering $94,000 in Lease Payment every year for the towns during the 20-year term as compensation for all 10 rooftop solar arrays.

These projects will connect to the meters of the buildings and will power the buildings with clean energy, but the transaction will occur between Conti and National Grid. This is perfectly aligned with the goals of Bristol and Barrington: promote the generation of clean energy, use available sites and buildings, and derive the maximum savings and/or revenue from the projects.

We will develop and build the rooftop arrays and secure 20-year PPAs with National Grid through the RE-Growth Program. Conti will share the proceeds of these projects in the form of lease payments, which shall be paid to the towns quarterly and shall begin at the start of the construction of each project.

The total annual Lease Payment of $94,000 per year is made up of smaller Lease payments for each of the 10 rooftops. Please find the individual assumed system sizes for each of the rooftop systems as well as its associated Lease Payment included in **Figure 4-6**. We used a lease rate of $51.8/kW to calculate the total annual lease rate for each building.

Figure 4-6: Rooftop Capacity and Lease Payments

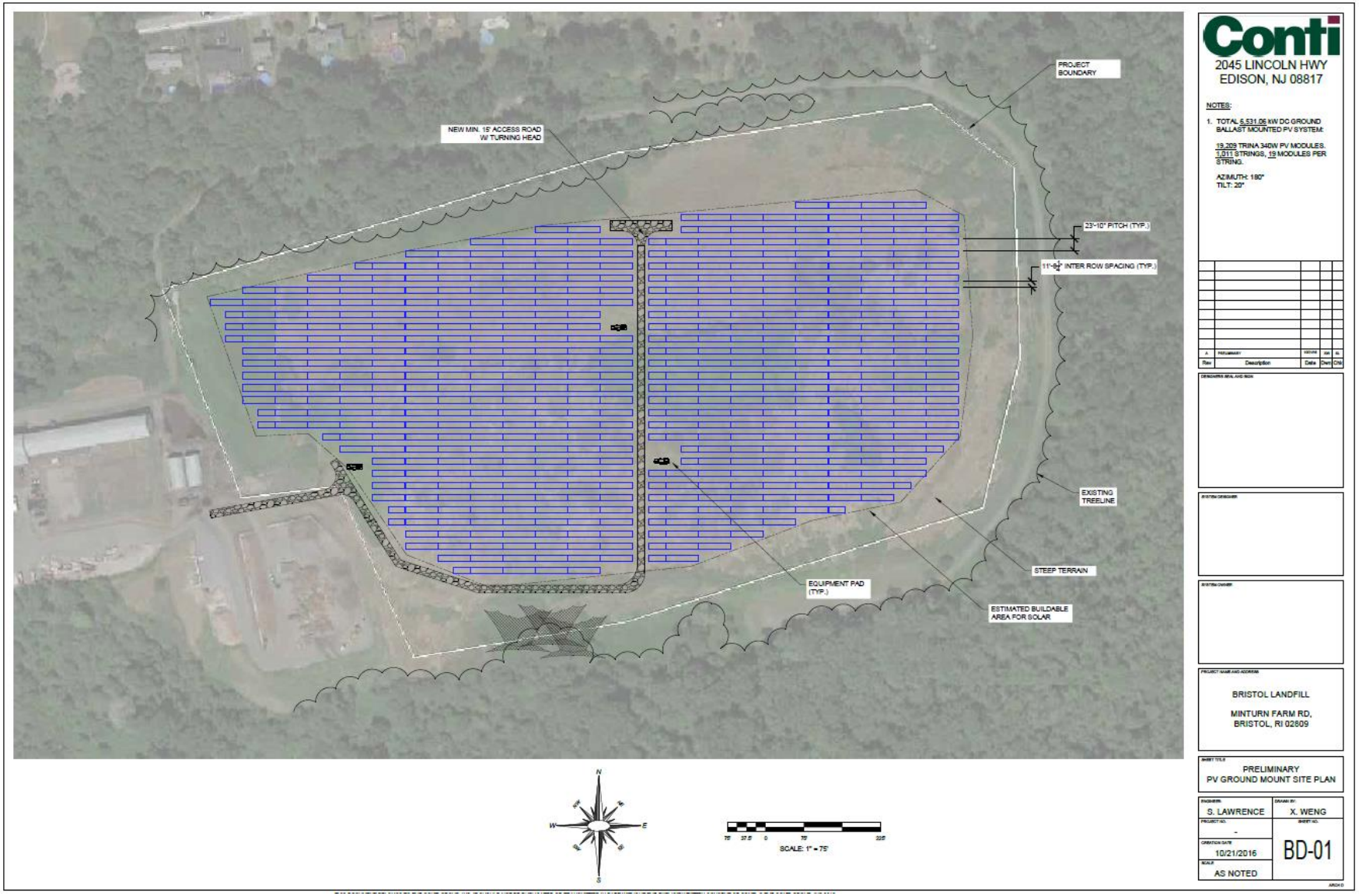
Building	Kilowatt Capacity	Annual Lease Rate
Bristol Town Hall	38	$1,972
Bristol Composting Building	50	$2,595
Quinta Gamelin Community Center	56	$2,907
Mt. Hope High School	477	$24,759
Barringtop High School	551	$28,560
Hampden Meadows	213	$11,056
Nayatt Elementary	125	$6,488
Primrose Hill	163	$8,461
Sowams Elementary	138	$7,163
Annual Total		**$94,000**
NPV of 20-Year Total		**$1,398,483**

4.3 Barrington Town Hall Project

Conti would be pleased to construct a 5 kW project at Barrington Town Hall at no charge to the town. We have not proposed a specific design, but would work with the town to determine the best placement for the project. A small rooftop project could take advantage of the RE-Growth Program's "small scale solar" and provide over $40,000 in revenue over a 20-year term. This system would be owned by Barrington and constructed and interconnected at no charge.

5. Project Designs

We have produced initial project designs for all proposed systems. While the final size and layout may change slightly during the design project, these plans were used to estimate the system location and annual production of each system.


PROJECT BOUNDARY
NEW MIN. 15' ACCESS ROAD W/ TURNING HEAD
23'-10" PITCH (TYP.)
11'-9½" INTER ROW SPACING (TYP.)
EXISTING TREELINE
STEEP TERRAIN
EQUIPMENT PAD (TYP.)
ESTIMATED BUILDABLE AREA FOR SOLAR
N
E
S
W
SCALE: 1" = 75'
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NOTES:
1. TOTAL 6,531.06 kW DC GROUND BALLAST MOUNTED PV SYSTEM:
19,209 TRINA 340W PV MODULES.
1,011 STRINGS, 19 MODULES PER STRING.
AZIMUTH: 180°
TILT: 20°
A PRELIMINARY
Rev Description Date Dwn Chk
BRISTOL LANDFILL
MINTURN FARM RD,
BRISTOL, RI 02809
PRELIMINARY
PV GROUND MOUNT SITE PLAN
S. LAWRENCE
X. WENG
-
10/21/2016
AS NOTED
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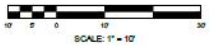


Conti
2045 LINCOLN HWY
EDISON, NJ 08817

NOTES:

1. TOTAL 37.62 kW DC ROOF MOUNTED PV SYSTEM:

   114 HANWHA 330W PV MODULES.
   6 STRINGS, 19 MODULES PER STRING.

   AZIMUTH: 163°
   TILT: 12°

Rev	Description	Date	Dwn	Chk
A	PRELIMINARY	11/09/16	JW	XL

DESIGNER SEAL AND SIGN

SYSTEM DESIGNER

SYSTEM OWNER

PROJECT NAME AND ADDRESS

BRISTOL TOWN HALL

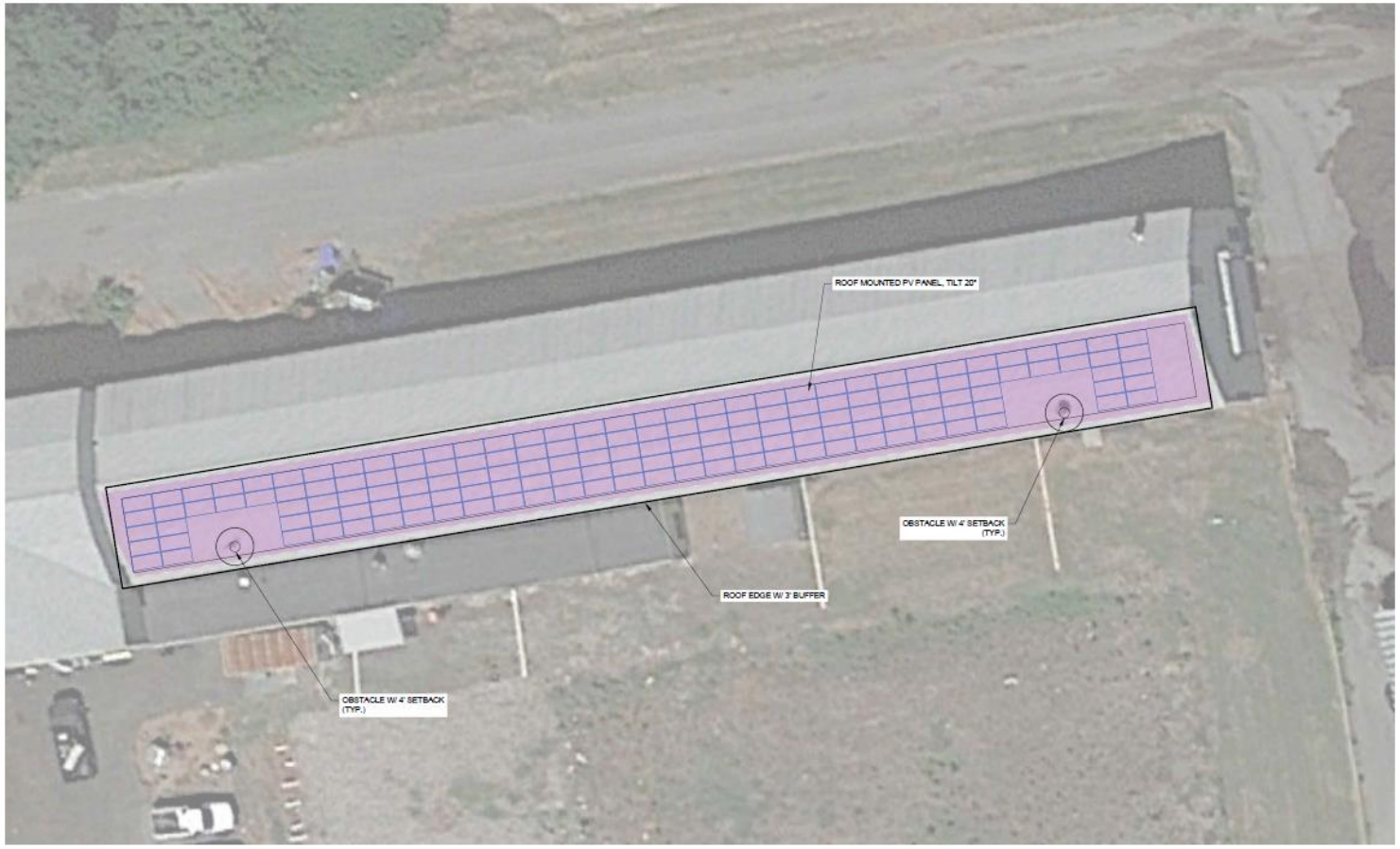
10 COURT ST,
BRISTOL, RI 02809

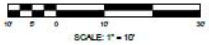
SHEET TITLE

PRELIMINARY
PV ROOF MOUNT SITE PLAN

ENGINEER: S. LAWRENCE	DRAWN BY: X. WENG
PROJECT NO. –	SHEET NO. BD-01
CREATION DATE 11/09/2016	
SCALE AS NOTED	

ARCH D





Conti
2045 LINCOLN HWY
EDISON, NJ 08817

NOTES:

1. TOTAL 50.16 kW DC ROOF MOUNTED PV SYSTEM

   152 HANWHA 330W PV MODULES.
   8 STRINGS, 19 MODULES PER STRING.

   AZIMUTH: 163°
   TILT: = 20°

Rev	Description	Date	Dwn	Chk
A	PRELIMINARY	11/09/16	XW	SL

DESIGNERS SEAL AND SIGN

SYSTEM DESIGNER

SYSTEM OWNER

PROJECT NAME AND ADDRESS

BRISTOL COMPOSTING BUILDING

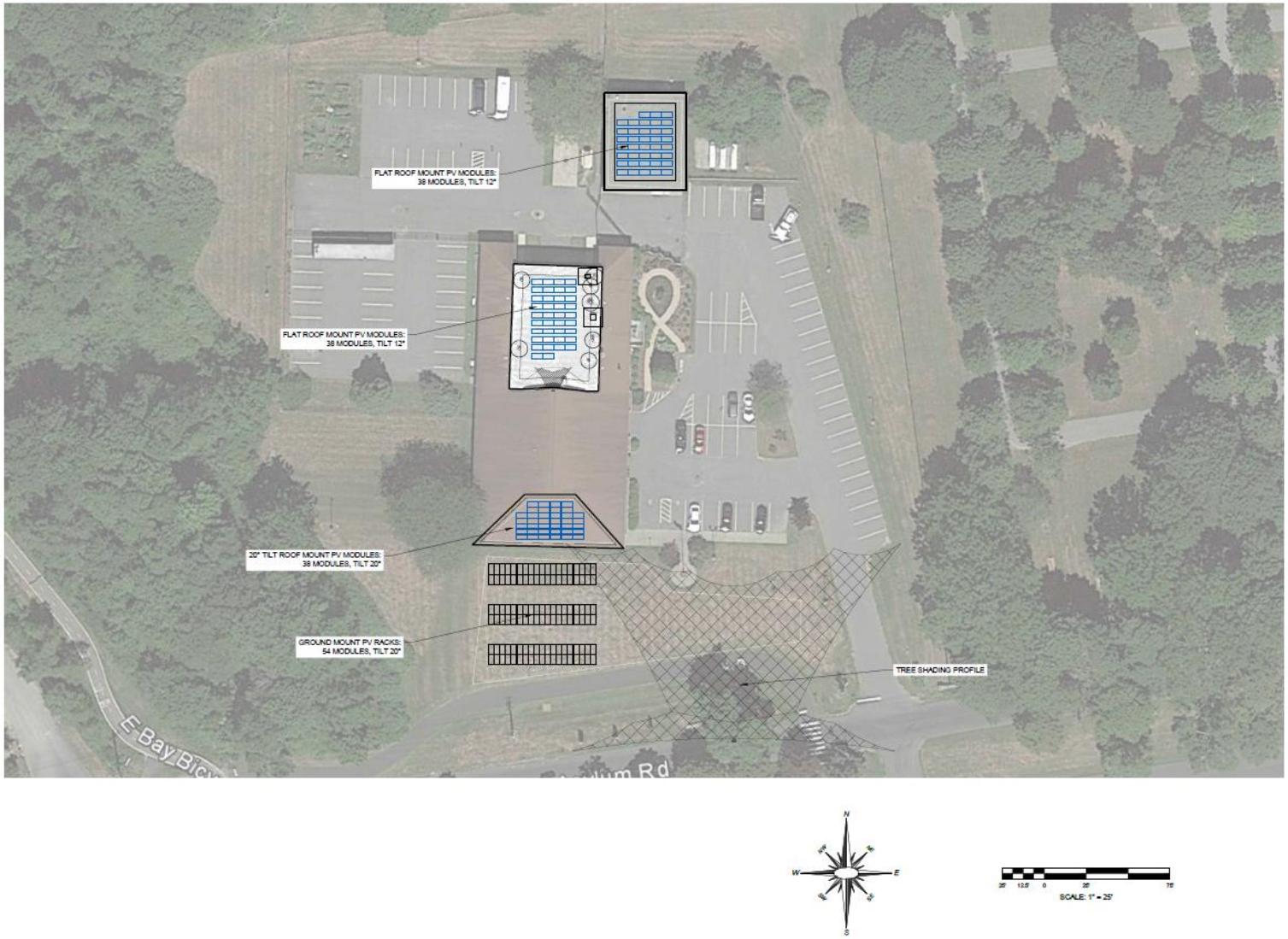
378 METACOM AVE,
BRISTOL, RI 02809

SHEET TITLE

PRELIMINARY
PV ROOF MOUNT SITE PLAN

ENGINEER:	DRAWN BY:
S. LAWRENCE	X. WENG
PROJECT NO. -	SHEET NO. BD-01
CREATION DATE 11/09/2016	
SCALE AS NOTED	

ARCH D



Conti
2045 LINCOLN HWY
EDISON, NJ 08817

NOTES:

1. TOTAL 56.43 kW DC GROUND / ROOF MOUNTED PV SYSTEM.

   171 HANWHA 330W PV MODULES.
   9 STRINGS, 19 MODULES PER STRING.

   AZIMUTH: 180°
   TILT: VERIES

Rev	Description	Date	Dwn	Chk
A	PRELIMINARY	11/16/16	GW	SL

DESIGNERS SEAL AND SIGN

SYSTEM DESIGNER

SYSTEM OWNER

PROJECT NAME AND ADDRESS

BRISTOL COMMUNITY CENTER

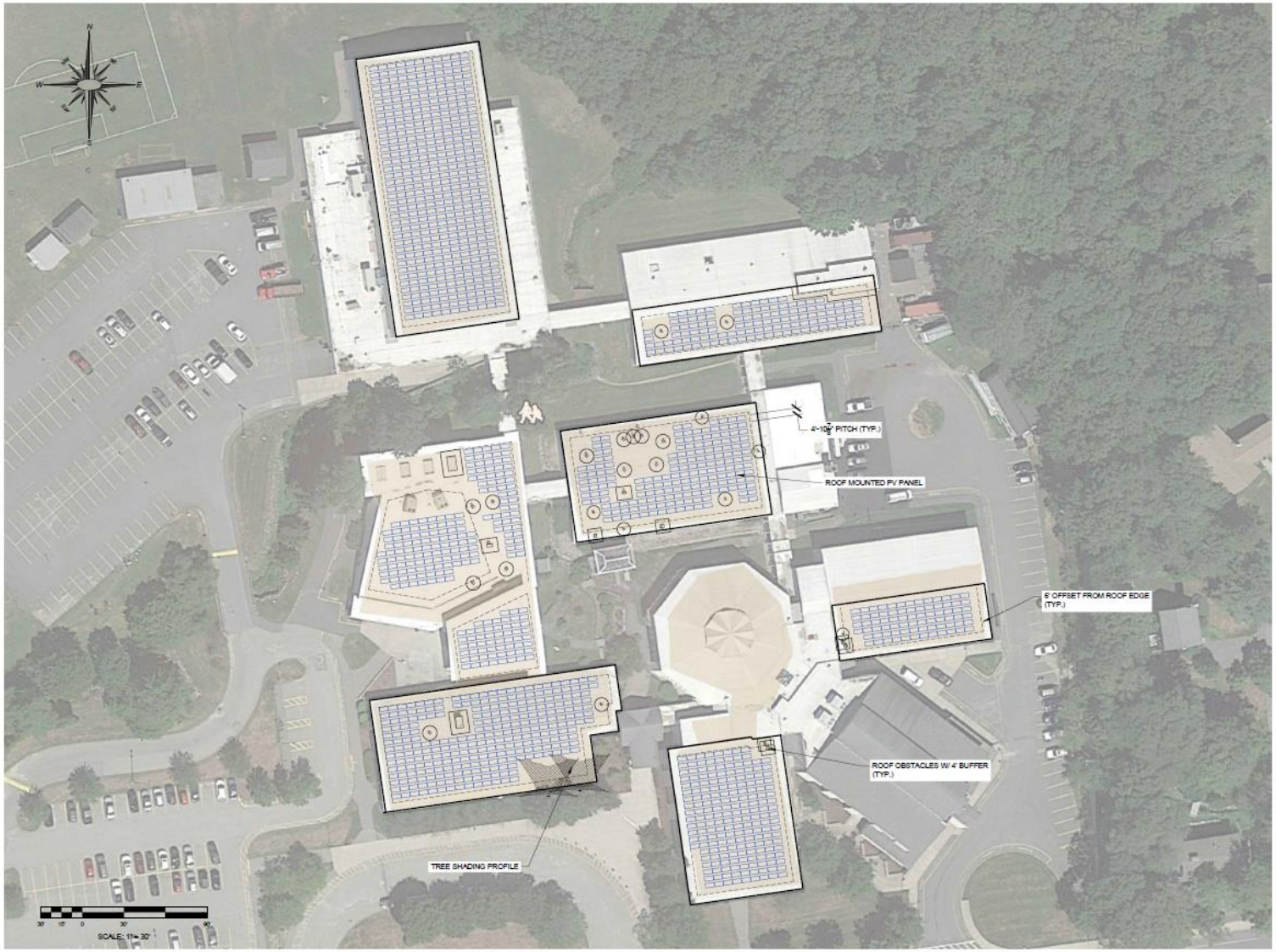
50 ASYLUM RD,
BRISTOL, RI 02809

SHEET TITLE

PRELIMINARY
PV SITE PLAN

ENGINEER: S. LAWRENCE	DRAWN BY: X. WENG
PROJECT NO.: -	SHEET NO.: BD-01
CREATION DATE: 11/16/2016	
SCALE: AS NOTED	

ARCH D



Conti
2045 LINCOLN HWY
EDISON, NJ 08817

NOTES:

1. TOTAL 476.52 kW DC ROOF MOUNTED PV SYSTEM:

   1444 HANWHA 330W PV MODULES.
   76 STRINGS, 19 MODULES PER STRING.

   AZIMUTH: 172°
   TILT: 12°

Rev	Description	Date	Dwn	Chk
A	PRELIMINARY	11/09/16	DM	SL

DESIGNERS SEAL AND SIGN

SYSTEM DESIGNER

SYSTEM OWNER

PROJECT NAME AND ADDRESS

MT. HOPE HIGH SCHOOL

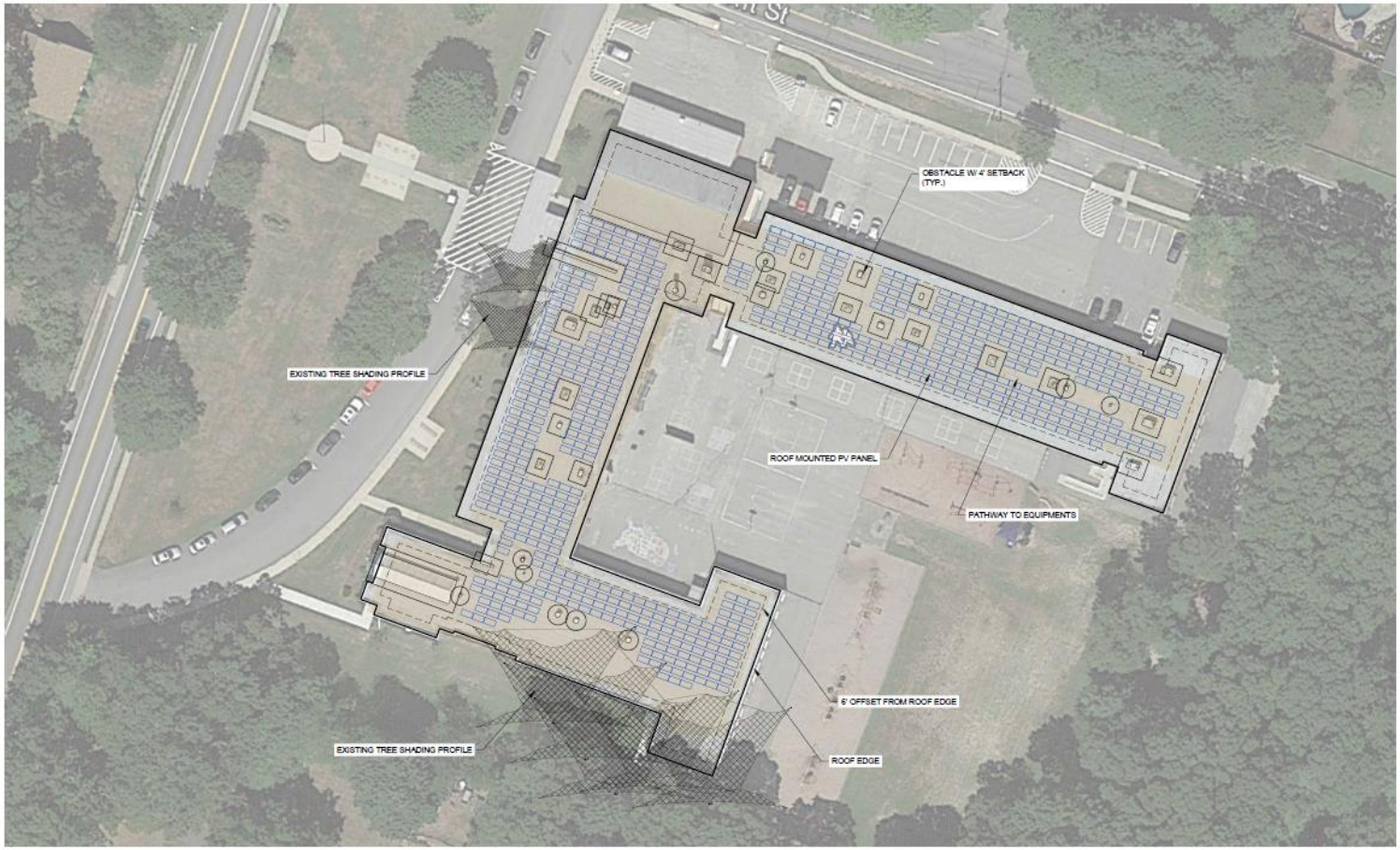
SHEET TITLE

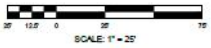
PRELIMINARY
PV ROOF MOUNT SITE PLAN

ENGINEER: S. LAWRENCE	DRAWN BY: X. WENG
PROJECT NO: -	SHEET NO: BD-01
CREATION DATE: 11/09/2016	
SCALE: AS NOTED	

ARCH D

OBSTACLE ON ROOFTOP (TYP.)
4' SETBACK FOR OBSTACLES (TYP.)
ROOF 1: (3) STRINGS (57) PANELS
ROOF 2: (22) STRING (418) PANELS
ROOF EDGE
4'-10 7/8" PITCH (TYP.)
6' SETBACK FROM ROOF EDGE (TYP.)
ROOF 3: (29) STRING (551) PANELS
40' CHIMNEY SHADING PROFILE
ROOF 4: (6) STRING (114) PANELS
ROOF 5: (28) STRING (532) PANELS
ASSUME: 20 DEG TILT ROOFTOP
ASSUME: 20 DEG TILT ROOFTOP
SCALE: 1" = 25'
Conti
2045 LINCOLN HWY
EDISON, NJ 08817
NOTES:
1. TOTAL 551.76 kW DC ROOF MOUNTED PV SYSTEM
1,672 HANWHA 330W PV MODULES.
88 STRINGS, 19 MODULES PER STRING.
AZIMUTH: 176°
TILT: 12°
A PRELIMINARY
Rev Description Date Dwn Chk
BARRINGTON HIGH SCHOOL
220 LINCOLN AVE,
BARRINGTON, RI 02806
PRELIMINARY
PV ROOF MOUNT SITE PLAN
S. LAWRENCE
X. WENG
11/02/2016
AS NOTED
BD-01





Conti
2045 LINCOLN HWY
EDISON, NJ 08817

NOTES:

1. TOTAL 213.18 kW DC ROOF MOUNTED PV SYSTEM
   646 HANWHA 330W PV MODULES.
   34 STRINGS, 19 MODULES PER STRING.
   AZIMUTH: 200°
   TILT: 12°

Rev	Description	Date	Dwn	Chk
A	PRELIMINARY	11/23/16	AW	SL

HAMPDEN MEADOWS SCHOOL
297 NEW MEADOW RD
BARRINGTON, RI 02806

PRELIMINARY
PV ROOF MOUNT SITE PLAN

S. LAWRENCE	X. WENG
-	BD-01
11/23/2016	
AS NOTED	

Conti
2045 LINCOLN HWY
EDISON, NJ 08817

NOTES:

1. TOTAL 125.4 kW DC ROOF MOUNTED PV SYSTEM.

380 HANWHA 330W PV MODULES.
20 STRINGS, 19 MODULES PER STRING.

AZIMUTH: 174°
TILT: 12°

Rev	Description	Date	Dwn	Chk
A	PRELIMINARY	11/23/16	SW	SL

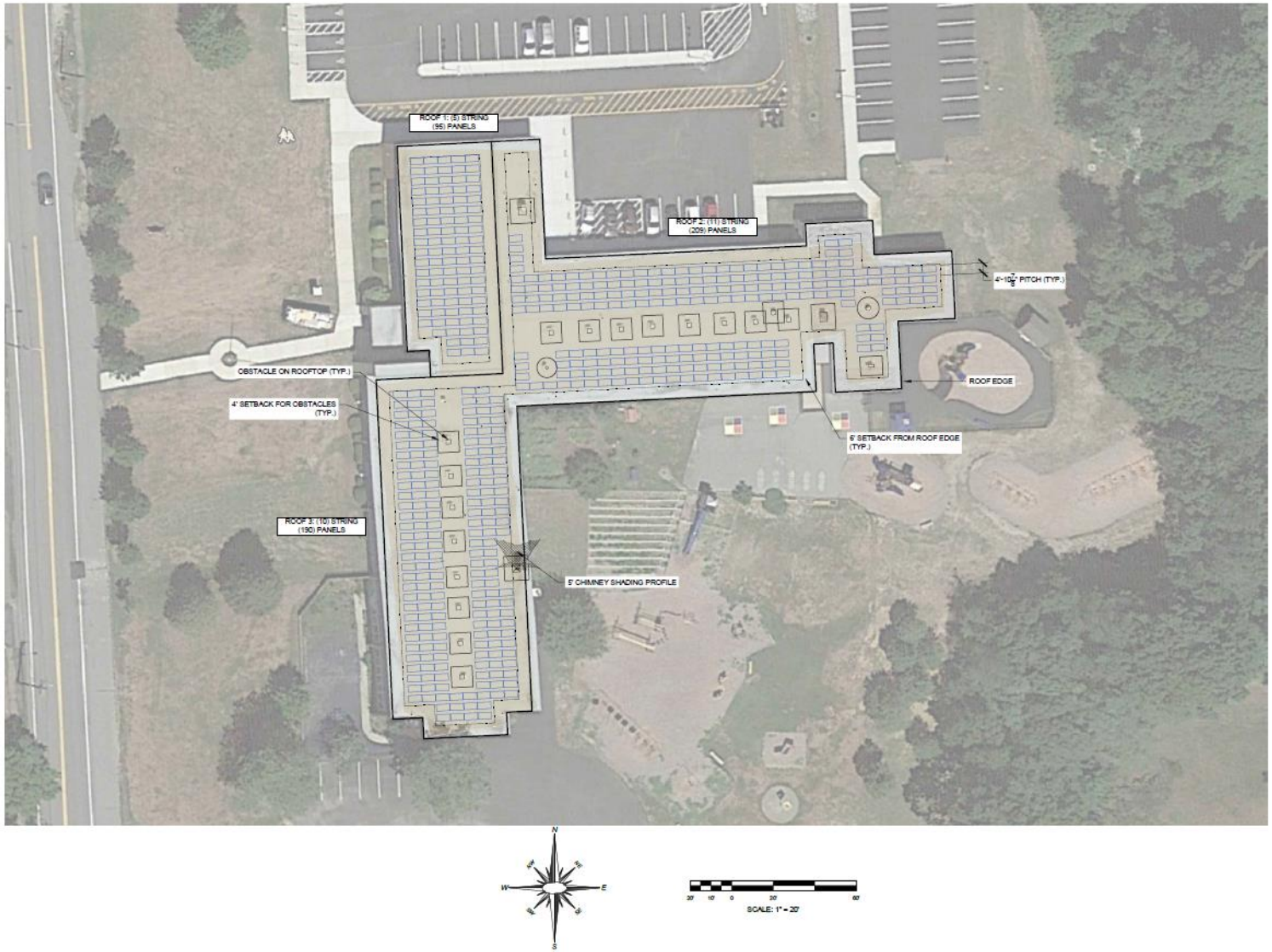
NAYATT SCHOOL

400 NAYATT RD
BARRINGTON, RI 02806

PRELIMINARY
PV ROOF MOUNT SITE PLAN

ENGINEER: S. LAWRENCE	DRAWN BY: X. WENG
PROJECT NO.: -	SHEET NO.: BD-01
CREATION DATE: 11/23/2016	
SCALE: AS NOTED	

SCALE: 1" = 25'



Conti
2045 LINCOLN HWY
EDISON, NJ 08817

NOTES:

1. TOTAL 163.02 kW DC ROOF MOUNTED PV SYSTEM.

   494 HANWHA 330W PV MODULES.
   26 STRINGS, 19 MODULES PER STRING.

   AZIMUTH: 177°
   TILT: 12°

Rev	Description	Date	Dwn	Chk
A	PRELIMINARY			

DESIGNERS SEAL AND SIGN

SYSTEM DESIGNER

SYSTEM OWNER

PROJECT NAME AND ADDRESS

PRIMROSE HILL SCHOOL

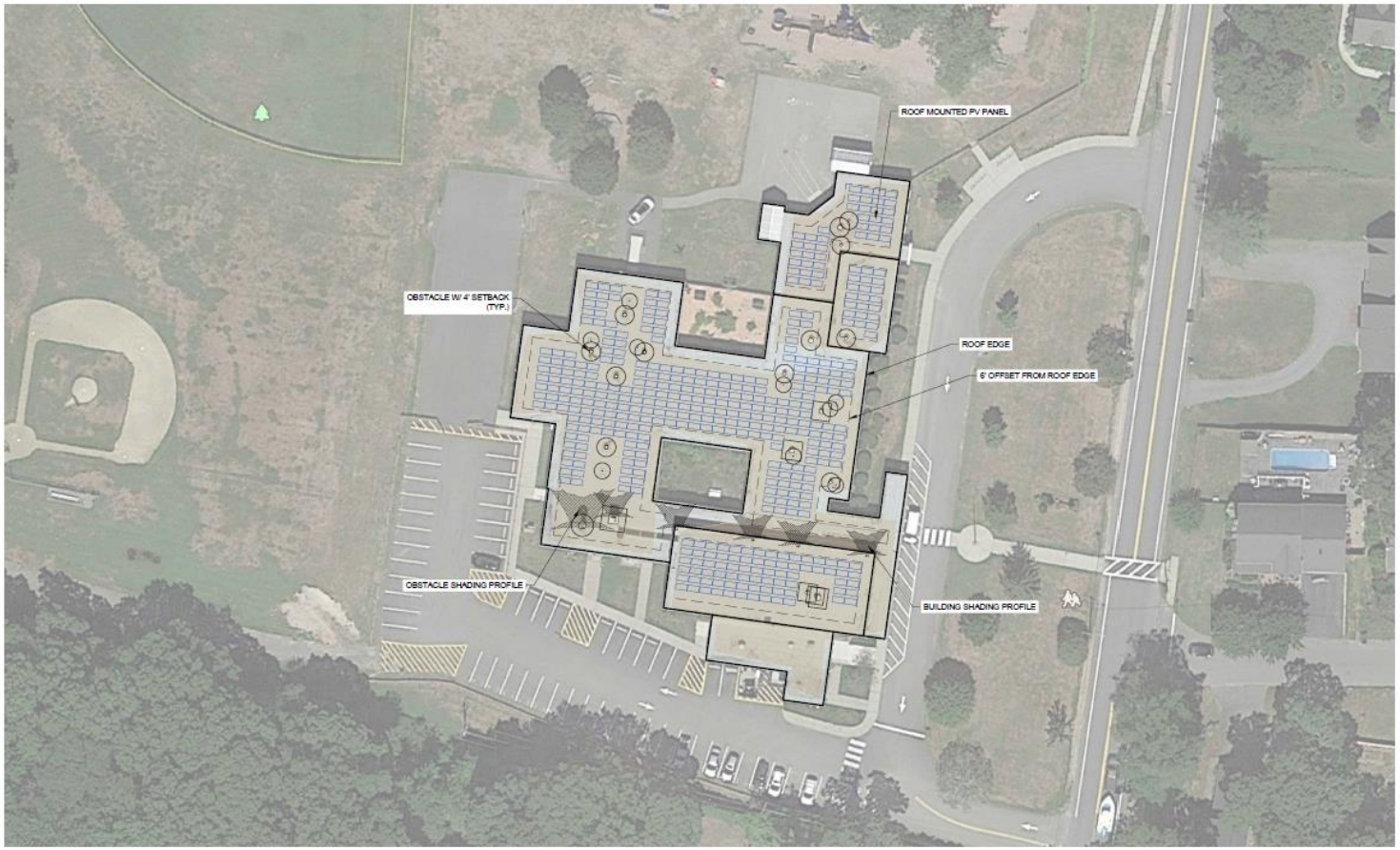
60 MIDDLE HIGHWAY
BARRINGTON, RI 02806

SHEET TITLE

PRELIMINARY
PV ROOF MOUNT SITE PLAN

ENGINEER: S. LAWRENCE	DRAWN BY: X. WENG
PROJECT NO.: -	SHEET NO.: BD-01
CREATION DATE: 11/03/2016	
SCALE: AS NOTED	

ARCH D



Conti
2045 LINCOLN HWY
EDISON, NJ 08817

NOTES:

1. TOTAL 137.94 kW DC ROOF MOUNTED PV SYSTEM.

   418 HANWHA 330W PV MODULES.
   22 STRINGS, 19 MODULES PER STRING.

   AZIMUTH: 188°
   TILT: 12°

Rev	Description	Date	Dwn	Chk
A	PRELIMINARY	11/23/16	SW	SL

DESIGNER SEAL AND SIGN

SYSTEM DESIGNER

SYSTEM OWNER

PROJECT NAME AND ADDRESS

SOWAMS ELEMENTARY SCHOOL

354 SOWAMS RD
BARRINGTON, RI 02806

SHEET TITLE

PRELIMINARY
PV ROOF MOUNT SITE PLAN

ENGINEER:	DRAWN BY:
S. LAWRENCE	X. WENG
PROJECT NO.: -	SHEET NO.: BD-01
CREATION DATE: 11/23/2016	
SCALE: AS NOTED	

ARCH D

6. Roof Replacements

In past projects, Conti has managed roof replacement process prior to solar installations. In the Morris County Solar Project, we inspected sixteen roofs and supervised the replacements process. We found the most cost-effective option was to install an EPDM coating over existing roof, however a detailed roof inspection is required in order to know whether this method is applicable.

Both the Mt. Hope High School and Barrington High School require roof replacements. The cost of these replacements depend on several factors, including the type of roof desired, the requirement to remove the existing roof, and subsequent inspections after the removal.

In the simplest form, the high school roofs could each be replaced for under $450,000, but several factors could increase this cost.

Conti offers to advise the towns on roof replacement process and assist in the selection of a contractor. Once the quotes have been received, we could consider paying for the roofs (or a portion of them) in lieu of the lease payments for other buildings.

7. Assumptions and Clarifications

In preparation of this proposal we have based our pricing on the following assumptions, conditions, and value engineering concepts to provide the most competitive pricing possible for this project.

7.1 General

- While we are in general agreement with the intent of the bid documents, the submittal of this bid proposal does not constitute full and complete acceptance of all contract terms and conditions in the bidding documents, which shall receive a more thorough review upon entering contract negotiations.
- The pricing provided is dependent on Conti being selected for all proposed projects.
- The pricing in this proposal is valid for 60 calendar days at which point Conti reserves the right to hold its original proposal or adjust the proposal as necessary.
- Builder's risk insurance with our standard coverage, terms and limits.
- Five (5) year workmanship warranty.
- It is assumed that the site conditions will allow all work to be performed in a continuous manner, during a normal 8-hour day, Monday through Friday; and, that access to the work areas will not require the use of extraordinary means and methods to accomplish the contract work.
- Sales tax in the State of Rhode Island is excluded.
- Our PVSyst has been designed with default losses. Losses subject to change based on actual design.
- Our pricing and project financing plan is based on current U.S. interest rates. If significant changes to these rates occur during the window for project financing, this may impact the cost of financing which could cause changes in pricing.
- We have based our pricing on the utility usage data provided by Bristol and Barrington during the RFP process. Various discrepancies exist in the data provided, and we made several reasonable assumptions to complete our analysis. If Conti is awarded this RFP, one of our first steps will be to perform a detailed analysis of Bristol and Barrington's annual usage to verify that the data provided during the RFP process is correct and to ensure all discrepancies in the data are solved.
- Our proposal is based on us being able to qualify all of the rooftops and a portion of the landfill for the RE Growth program. We expect the rooftops to be relatively easy to qualify for RE-Growth since most of them are under 250kW and do not need to be entered into an auction. The RE-Growth portion of the landfill will fall under the Large-Solar RE-Growth designation which requires us to enter the project into the RE-Growth auction. We plan to offer a competitive price for the RE-Growth auction, but there is a small chance that we will not be awarded the RE-Growth feed-in-tariff due to downward pricing pressure from competition.

- We have made reasonable assumptions for the value of Rhode Island Renewable Energy Certificates at approximately $22.50/MWh, should the value of RECs change substantially, it will impact the economics of the project which could cause changes in pricing.

- We have assumed that the Remote Net Metering Landfill Sub-array will qualify for two separate REF grants because the array will have two separate meters for Bristol and Barrington. We received assurance to this effect from the REF Program Manager.

7.2 Discount Rate

We have determined the best method for estimating the discount rate for the towns is by analyzing the current yield of outstanding bonds trading in the market. We reviewed all outstanding bonds for Bristol and Barrington that were available through our Bloomberg terminal and found that the average bond yield for existing 10 year bonds is approximately 2.15%. This value is effectively the cost of capital for the towns. In order to be conservative, we added roughly 50% to this discount rate, and arrived at an assumed discount rate of 3%. We used a discount rate of 3% when calculating the present value of future savings or payments to Bristol and Barrington.

7.3 Rooftop Arrays

- It is assumed that the existing roofs/ buildings are in good condition to accommodate solar panels. Building/ roof modifications, penetrations and structural analyses are excluded from our price.

- It is assumed that lulls will be sufficient to load material on to the roof. Cranes have not been figured in our crew.

- As shown in our diagram, the Bristol Town Hall is subject to shading from trees next to the building. Our estimated kW capacity is based on removing the trees. We can also work with the town to provide a smaller design.

- We proposed a combination rooftop/ground-mount array for the Bristol Quinta Gamelin Community Center. This represents a conceptual drawing; if Bristol is interested in such an array, we will work closely to determine the proper placement and setback requirements, and to assess shading obstructions.

- We have performed an initial visual inspection of all of the rooftops we are proposing for solar at Bristol and Barrington, and we believe that the roofs are structurally sound for solar. We will need to perform a detailed structural analysis of each roof to verify this before we can guarantee that each system is able to be built.

7.4 Analysis of Town Energy Costs

As mentioned in Section 4, we analyzed the towns' electricity data to determine a "weighted average" net metering credit to which we compared our PPA rate.

We used the provided energy data to calculate a weighted average. We combined Bristol's weighted average ($0.111/kWh) and Barrington's ($0.10/kWh) to arrive at $0.105 as the total weighted average cost of power for the towns. We used this weighted average cost of power as a benchmark to calculate savings for Bristol and Barrington and we assumed that this price will escalate by 3% per year for the

next 20 years. We would like to clarify that our calculation of the weighted average cost of power involved an estimation based on the available data provided during the RFP process. If awarded the project, we will analyze all electricity usage and provide a refined value for weighted average cost of energy to solidify the energy savings.

The reason for the relatively high average is that the bulk of the towns' usage is at the G-02 meters rather than C-06 ones. As shown in Section 4, we offer a 40.7% energy discount to C-06 meters, but our estimated overall Year 1 discount is 20%.

The figures below show our analysis of the towns' meters:

Figure 7-1: G-32 Consumption

G-32 Tariff Facility	Utility Tariff	Net Metering Credit Value	Annual kWh Consumption	Annual Electricity Costs
Bristol Sewer - Plant Ave	G-32	$ 0.0617	1,531,200	$ 94,414
Barrington High School	G-32	$ 0.0617	966,495	$ 59,594
		Totals	**2,497,695**	**$ 154,008**
		Average Electricity Price / kWh	**$ 0.0617**	

Figure 7-2: Bristol Facilities

Bristol Facility	Utility Tariff	Net Metering Credit Value	Annual kWh Consumption	Annual Electricity Costs
Town Hall - 9 Court St	C-06	$ 0.1416	25,000	$ 3,539
Fire Defiance	C-06	$ 0.1416	12,598	$ 1,783
Fire Dreads	C-06	$ 0.1416	21,255	$ 3,009
Fire Everreadys	C-06	$ 0.1416	25,000	$ 3,539
Recreation Beach	C-06	$ 0.1416	25,000	$ 3,539
Maritime Center	C-06	$ 0.1416	25,000	$ 3,539
Reynolds	C-06	$ 0.1416	23,586	$ 3,339
Byfield	C-06	$ 0.1416	25,000	$ 3,539
Senior Center	C-06	$ 0.1416	25,000	$ 3,539
Town Hall - 10 Court St	G-02	$ 0.0987	161,360	$ 15,933
DPW - 111 Mt Hope	G-02	$ 0.0987	80,600	$ 7,958
Police - Metacom	G-02	$ 0.0987	145,840	$ 14,400
Fire HQ	G-02	$ 0.0987	186,680	$ 18,433
Recreation QG	G-02	$ 0.0987	50,000	$ 4,937
Rogers Free Library	G-02	$ 0.0987	41,204	$ 4,068
Mt Hope High School	G-02	$ 0.0987	813,322	$ 80,275
Remaining Undocumented Load at C-06	C-06	$ 0.1416	654,813	$ 92,702
Remaining Undocumented Load at G-02	G-02	$ 0.0987	654,813	$ 64,630
		Totals	**2,996,071**	**$ 332,704**
		Average Electricity Price / kWh	**$ 0.111**	

highlight means an estimate based on available data

Figure 7-3: Barrington Facilities

Barrington Facility	Utility Tariff	Net Metering Credit Value	Annual kWh Consumption	Annual Electricity Costs
Bay Spring Com Ctr	C-06	$ 0.1416	25,000	$ 3,539
Sewer Police	C-06	$ 0.1416	25,000	$ 3,539
Barrington Middle School	G-02	$ 0.0987	829,920	$ 81,946
Hampden Meadows	G-02	$ 0.0987	204,988	$ 20,241
Library / Senior Center	G-02	$ 0.0987	335,520	$ 33,129
Nayatt Elementary	G-02	$ 0.0987	111,760	$ 11,035
Primrose Hill	G-02	$ 0.0987	119,160	$ 11,766
Public Safety Building	G-02	$ 0.0987	506,720	$ 50,034
Public Works	G-02	$ 0.0987	76,101	$ 7,514
Sowams Elementary	G-02	$ 0.0987	114,720	$ 11,327
Town Hall	G-02	$ 0.0987	166,020	$ 16,393
Sewer Walnut Rd	G-02	$ 0.0987	150,160	$ 14,827
Sewer Bay Spring	G-02	$ 0.0987	150,160	$ 14,827
		Totals	**2,815,229**	**$ 280,117**
		Average Electricity Price / kWh	**$ 0.100**	

highlight means an estimate based on available data

8. Attachments

8.1 Attachment A

TOWN OF BRISTOL and TOWN OF BARRINGTON, RI

INVITATION FOR RFQ/RFP
BID #850
PUBLIC-PRIVATE PARTNERSHIP FOR ON-SITE SOLAR PROJECTS

Attachment A
Town of Bristol

BID FORM

NAME AND ADDRESS OF BIDDING FIRM:

Conti Enterprises

2045 Lincoln Hwy

Edison, NJ 08817

I herein agree to abide by all requirements as detailed in the "Invitation for Bid #850".

Signature: _____

Printed Name & Title: Vice President, Solar Development

Date: 29 November 2016

INVITATION FOR RFQ/RFP
BID #850
PUBLIC-PRIVATE PARTNERSHIP FOR ON-SITE SOLAR PROJECTS

Attachment A
Town of Barrington

BID FORM

NAME AND ADDRESS OF BIDDING FIRM:

Conti Enterprises

2045 Lincoln Hwy

Edison, NJ 08817

I herein agree to abide by all requirements as detailed in the "Invitation for Bid #850".

Signature: _____

Printed Name & Title: Vice President, Solar Development

Date: 29 November 2016

8.2 Attachment B

TOWN OF BRISTOL and TOWN OF BARRINGTON, RI

INVITATION FOR RFQ/RFP
BID #850
PUBLIC-PRIVATE PARTNERSHIP FOR ON-SITE SOLAR PROJECTS

ATTACHMENT B
Non-COLLUSION AFFIDAVIT
To Be Completed, Notarized, and Submitted With Bid

State of Rhode Island
County of Bristol

" Conti Enterprises, Bidder, being first duly sworn, deposes and says that he or she is Owner of the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other Bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any Bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other Bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and further, that the Bidder has not , directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid."

29 November 2016	0915 in Edison, NJ
Date	(Signed at)
Conti Enterprises	
Bidder name (Person, Firm, Corp.)	Authorized Representative
2045 Lincoln Hwy	Eric K. Millard
Address	Representative's Name
Edison, NJ 08817	Vice President, Solar Development
City, State, Zip	Representative's Title

8.3 Attachment C

TOWN OF BRISTOL and TOWN OF BARRINGTON, RI

INVITATION FOR RFQ/RFP
BID #850
PUBLIC-PRIVATE PARTNERSHIP FOR ON-SITE SOLAR PROJECTS

ATTACHMENT C

BIDDER'S STATEMENT
REGARDING INSURANCE COVERAGE

BIDDER HEREBY CERTIFIES that the Bidder has reviewed and understands the insurance coverage requirements specified in the Invitation for Bid No. 850, Public – Private Partnership for On-Site Solar Projects. Should the Bidder be awarded the contract for the work, Bidder further certifies that the Bidder can meet the specified requirements for insurance and agrees to provide the Town with a certificate of insurance which names the Town of Bristol and the Town of Barrington as an Additional Insured for the work specified.

Insurance Required:

- Workman's Compensation in compliance with statutory limits
- Comprehensive General Liability Insurance of at least $1,000,000.

Conti Enterprises
Name of Bidder (Person, Firm, or Corporation)

Signature of Bidder's Authorized Representative

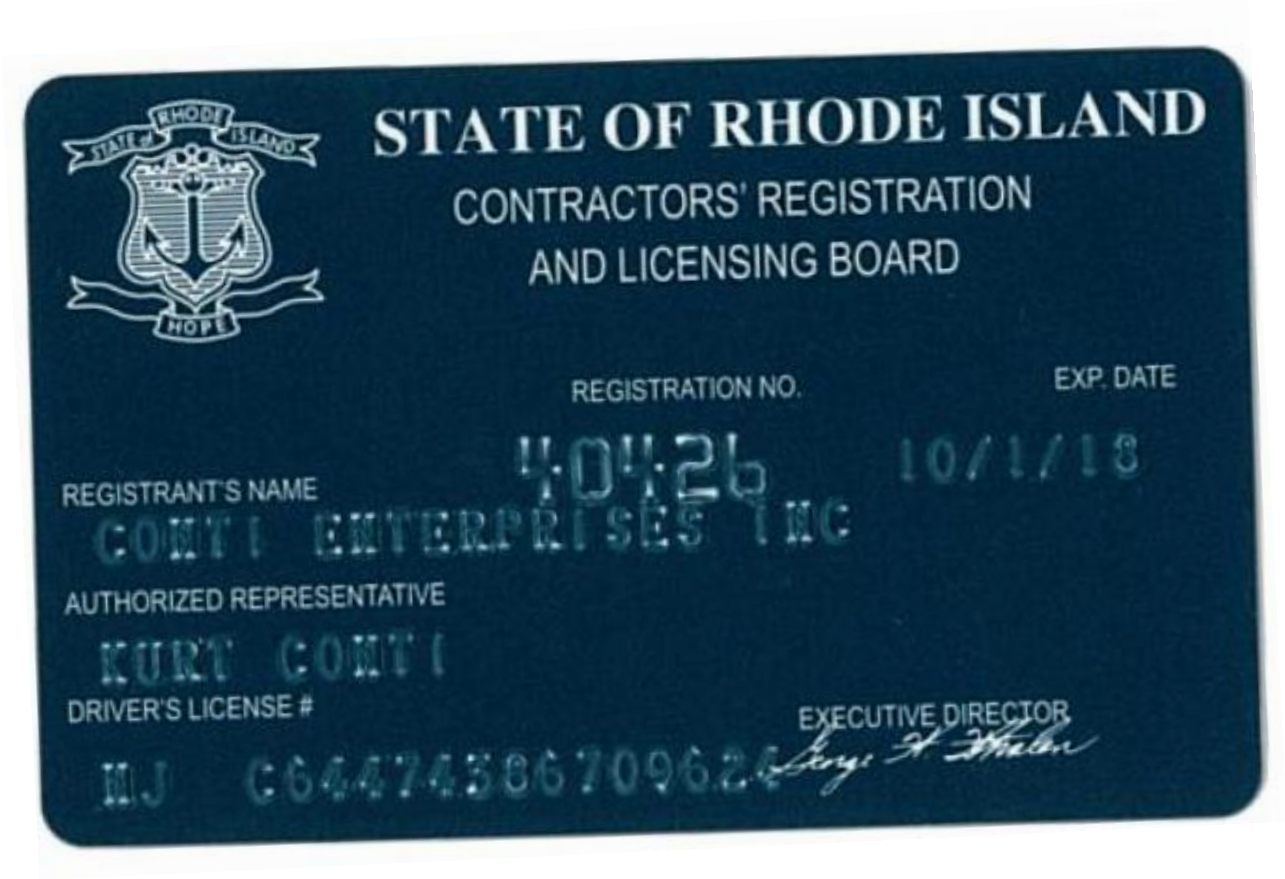
Eric K. Millard, Vice President, Solar Development
Name & Title of Authorized Representative

29 November 2016
Date of Signing

8.4 Attachment D

Project summaries and references are provided in **Section 3** of this proposal.

8.5 Rhode Island Contractor's License



8.6 PV Specification Sheet

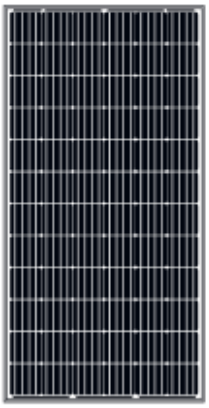
As noted in Section 1.3, we have not made final equipment selection for this project. Conti works with a stable of Tier 1 equipment suppliers in order to offer the most competitive pricing, and we will make the final selection for equipment when the project is closer to construction.

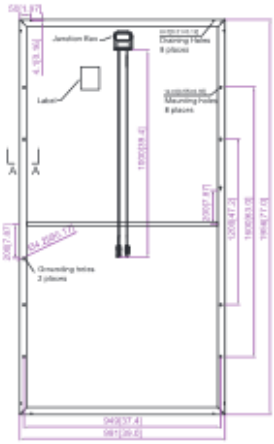
We have included specification sheet for the JA Solar JAM6 350 Module, which we have used in past projects and will consider for the Bristol and Barrington projects.

JA SOLAR

JAM6(K)-72/330-350/PR

Engineering Drawings





■ customized cable length available upon request

MECHANICAL PARAMETERS

Cell (mm)	Almost Full Square Mono 156.75x156.75
Weight (kg)	26.5 (approx)
Glass Thickness	4 mm
Dimensions (L×W×H) (mm)	1956×991×45
Cable Cross Section Size (mm^2)	4
No. of Cells and Connections	72 (6×12)
Junction Box	IP67, 3 diodes
Connector	MC4 Compatible
Packaging Configuration	23 Per Pallet

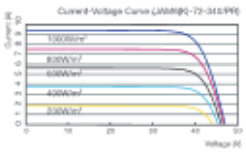
WORKING CONDITIONS

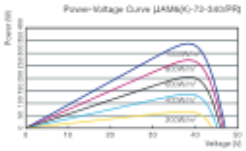
Maximum System Voltage	DC 1000V (IEC)
Operating Temperature	-40℃~+85℃
Maximum Series Fuse	15A
Maximum Static Load, Front Maximum Static Load, Back	5400Pa (112 lb/ft²) 2400Pa (50 lb/ft²)
NOCT	45±2℃
Application Class	Class A

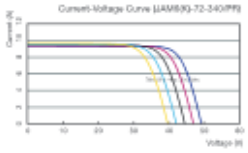
ELECTRICAL PARAMETERS

TYPE	JAM6(K) -72-330/PR	JAM6(K) -72-335/PR	JAM6(K) -72-340/PR	JAM6(K) -72-345/PR	JAM6(K) -72-350/PR
Rated Maximum Power at STC (W)	330	335	340	345	350
Open Circuit Voltage (Voc/V)	46.49	46.68	46.86	47.05	47.24
Maximum Power Voltage (Vmp/V)	37.78	37.96	38.18	38.39	38.58
Short Circuit Current (Isc/A)	9.31	9.38	9.46	9.54	9.61
Maximum Power Current (Imp/A)	8.73	8.83	8.91	8.99	9.07
Module Efficiency [%]	17.02	17.28	17.54	17.80	18.06
Power Tolerance (W)	-0~+5W				
Temperature Coefficient of Isc (αIsc)	+0.060%/℃				
Temperature Coefficient of Voc (βVoc)	-0.300%/℃				
Temperature Coefficient of Pmax (γPmp)	-0.390%/℃				
STC	Irradiance 1000W/m^2, Cell Temperature 25℃, Air Mass 1.5				

I-V CURVE







NOCT

TYPE	JAM6(K) -72-330/PR	JAM6(K) -72-335/PR	JAM6(K) -72-340/PR	JAM6(K) -72-345/PR	JAM6(K) -72-350/PR
Max Power (Pmax) [W]	241.26	244.92	248.57	252.23	255.89
Open Circuit Voltage (Voc) [V]	42.77	42.97	43.18	43.39	43.61
Max Power Voltage (Vmp) [V]	34.52	34.79	35.06	35.33	35.59
Short Circuit Current (Isc) [A]	7.57	7.63	7.68	7.74	7.81
Max Power Current (Imp) [A]	6.99	7.04	7.09	7.14	7.19
Condition	Under Normal Operating Cell Temperature, Irradiance of 800 W/m^2, spectrum AM 1.5, ambient temperature 20℃, wind speed 1 m/s				

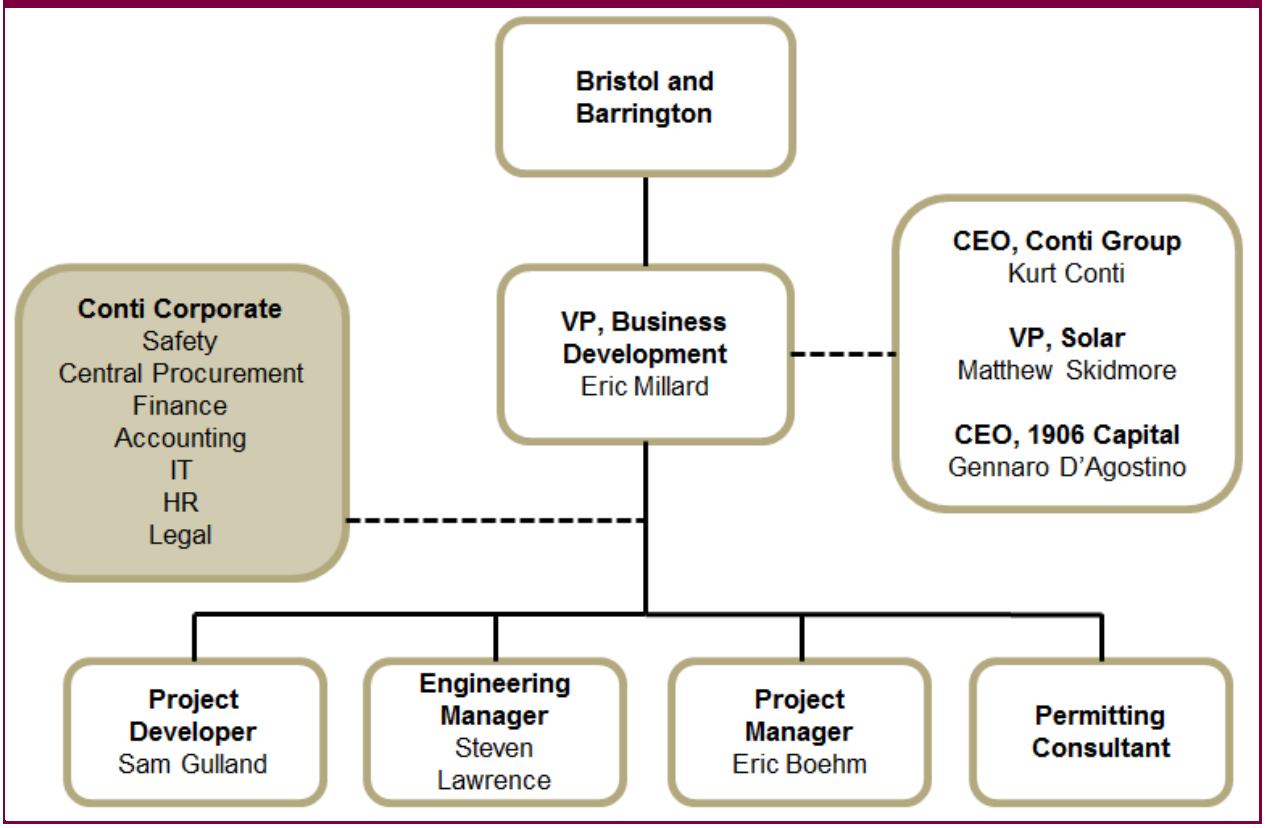
Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

JA Solar 05.2016

9. Project Team

9.1 Organizational Chart

Figure 9-1: Project Organizational Chart



9.2 Team Resumes

Matthew Skidmore

Vice President, Solar Division

Mr. Skidmore is a trained and experienced operations manager at developing, designing, and constructing large-scale solar ground, rooftop, carport solar PV systems and heavy highway infrastructure projects. He has overseen the management of projects for the public, private, and federal sector all around the country.

He has a wide range of experience in the management of direct construction activities, design consultants, and subcontractors, including projects of diverse size, scope, and nature. He reviews schedules, manpower loading requirements, material requisitions, safety policies and procedures, and has worked closely with a variety of client agencies on complex construction projects in different regions. His wide range of construction skills, coupled with broad experience in challenging infrastructure construction, provides him with a solid foundation for managing complex projects. To date, Mr. Skidmore has been involved with the project design and installation of over 100 MW of solar PV and the development of another 50 MW.

Education:

- BS, Civil Engineering, 2007, Bucknell University, PA

Professional Development:

- EIT
- American Society of Civil Engineers (ASCE)
- OSHA 10-Hr Constr. Safety
- OSHA 8-Hr Supervisor
- OSHA 30-Hr Construction S&H
- OSHA 8-Hr Refresher
- Excavation Competent Person
- Confined Space/Monitoring

Eric Millard

Vice President, Solar Business Development

Mr. Millard is Vice President of Business Development for Conti's Solar Division. He began as a Project Engineer and Project Manager on multiple complex projects in the Federal and private construction markets in the Northeastern US, including eight solar projects since 2013. His clients include national energy providers such as PSE&G and Constellation Energy, as well as the U.S. Army Corps of Engineers. Since then, Mr. Millard transitioned into project development, where he complements his technical knowledge with understanding of state electricity markets, financing techniques, and interconnection processes. He has developed large solar projects for public and private sectors, and using a PPA or merchant/utility off-takes.

Education

- MBA, UNC Chapel Hill, 2016
- BS, Mechanical Engineering, Boston University, 2007

Professional Development

- USACE CQCSM Training 2008
- American Society of Mechanical Engineers
- Society of American Military Engineers
- Conti Leadership Development Program
- OSHA HAZWOPER 40-hr, 2007

Sam Gulland

Project Developer, Solar

Mr. Gulland is a Project Developer in Conti's solar division. He served as an Army Infantry officer from 2010-2015, most recently in the 75th Ranger Regiment. He studied energy markets, policy, and project finance at the Clean Energy Leadership Institute.

His development focus is on utility-scale projects in New York State and in New England, and on partnering with the Department of Defense to improve on-base clean energy generation and base energy security. His project experience includes feed-in-tariffs, wholesale projects, and "net metering" arrangements in multiple U.S. markets.

Education

- BA, Princeton University, 2006

Professional Development

- US Army Ranger School, 2011
- Clean Energy Leadership Institute (Spring 2016 Fellow)

Eric Boehm

Project Manager, Solar

Mr. Boehm is an experienced project manager with direct project management and site field management experience for a number of varied and complex sites, including solar, environmental, building, civil and infrastructure projects, as well as security work. Since 2014, Mr. Boehm has installed over 30 MW of solar PV, and his project experience encompasses work for public- and private-sector clients in the New York City metropolitan area. He has a proven ability to manage and track large, complex projects requiring demanding schedules, fast-track production and the attention to detail that yields a quality construction product. His specific project experience is in HTRW (since 2007), railroad work (since 2005), bridges (since 2005), vertical construction (2005), and environmental (since 2008).

Education

- BS, Civil & Environmental Engineering, Villanova University, 2005

Professional Development

- OSHA 29 CFR 1910.120-40-Hour Basic Training
- 30-Hr Construction Safety & Health Training
- Confined Space/Monitoring
- Conti Leadership Development Program
- Dale Carnegie: Skills for Success Certification
- Dale Carnegie: How to Communicate with Diplomacy & Tact
- FMI: Contractor Selling Skills

Steven Lawrence

Senior Systems Engineer, Solar

Mr. Lawrence is an NABCEP Certified Solar PV InstallerTM with over 7 years of experience in the solar industry. He has successfully designed over 170 projects totaling 11MW that are fully operational located in NJ, NY, CT, PA, and CA. He also has designed 3.3MW of solar PV that is currently under construction in CA and MA and continues to provide field support to those installations. He is responsible for training new hires and mentoring their development as they learn how to design solar PV. He's developed templates and tools for code compliant and efficient designs. He is fluent in site surveys, submitting permits to the Authority Having Jurisdiction, interconnection, full system design and commissioning. Previously he worked at The Solar Center where he was the Engineering Manager in charge of handling all designs, all permits, all interconnections, and all surveys while overseeing a team of five. He was also responsible for the design and permitting of solar hot water systems.

Education

- BS, Mathematics, 2004
  New York University, NY
- BS, Mechanical Engineering, 2004
  Stevens Institute of Technology, NJ

Professional Associations:

- NABCEP Certified Solar PV Installer TM
- Engineering in Training, NJ