KNOXVILLE HISTORIC ZONING COMMISSION
STAFF REPORT - CERTIFICATE OF APPROPRIATENESS APPLICATION

PROPERTY ADDRESS: 813 Deery St 37917 **FILE NO.: 8-K-16-HZ**

DISTRICT: Fourth and Gill H-1

MEETING DATE: 8/18/2016

APPLICANT: Benjamin Auerbach Prime Renovations (owner)

LEVEL OF WORK: Level II. Installation of solar panels

PROPERTY DESCRIPTION: Queen Anne (1891)

Two-story frame with weatherboard and imbricated shingle wall covering. Hip roof with lower cross gables, side hipped roof dormer, rear shed roof dormer, raised panels, brackets, fishscale shingles and square vent in front and side gables, asphalt shingle roof covering. Queen Anne-over-one double-hung windows. One-story full front and side wrap-around porch with turned wood columns, checkered pediment over front steps with raised square applied motif and brackets forming segmental arches. Vertically corbelled stuccoed brick interior offset chimney. Brick foundation. Cut-away bay on north elevation with applied sunburst in central wall rather than window.

DESCRIPTION OF WORK:

LEVEL I
Repair and restore 15 original wood double-hung windows. Replace rotted siding between upper and lower levels of rear porches. Replace porch flooring with 1x4 wood tongue-and-groove. Replace plywood ceiling on lower rear porch with wood beadboard. Replace ashalt shingles in-kind on ear porch roof and entire house.

LEVEL ll
Installation of eighteen (18) ~39.5"x66" reflective solar panels on southeast face of side-gabled roof. Panels (in black) are to be flush-mounted to a metal rail system, also black, parallel at less than 6 inches above the roof shingles. They will have an anti-glare finish that will minimize their reflectivity. An inverter and second power meter will be installed on the side of the house alongside the existing power meter and above the power box.

APPLICABLE DESIGN GUIDELINES:

Fourth and Gill Design Guidelines, adopted by the Knoxville City Council on April 20, 1999 and June 29, 1999.
MECHANICAL GUIDELINES

3. Solar collectors should not be visible from public streets.

PROPOSED SOLAR PANEL GUIDELINES for FOURTH & GILL
Contemporary solar additions to building roofs have no historic counterpart and make a strong impact of the visual character of existing buildings. While both goals of historic preservation and energy conservation are important, care must be taken that one is not achieved at the expense of the other.

In designing and obtaining permission to install solar technology on a historic home, the applicant is to consider the following preferences and requirements for design and placement of solar devices. These provisions are designed to minimize irreversible visual and structural impact of the devices on the historic appearance of the building.

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The Historic Zoning Commission is under no obligation to approve projects that do not adhere strictly to these guidelines, and may require that more preferred alternatives be pursued as a condition of project approval.

Requirements:

Solar technology should not be visible from public streets or, if visible, should be installed on an accessory building, a rear facing elevation, or a side elevation that does not face onto a public street.

In all cases, regardless of the location of the solar installation -

1.Solar collectors and mounting systems should be compatible in color to the property's roof materials.

2.Framing equipment associated with the installation of solar technology, including brackets, edging around solar collectors, and other metal features, should be treated, color clad, or covered to be made as unobtrusive as possible and to minimize contrast between the solar collectors and equipment and any roofing materials.

3.Slope, elevation and position relative to existing architectural features should be minimally visible from public streets.

4.Historic roofing materials or features, including dormers and chimneys, may not be irrevocably altered or removed for the solar installation.

6.For roof-mounted solar installations:
The solar equipment should be mounted parallel to the roof slope and not more than six inches above the roof, as measured vertically from the top of the equipment to the roof surface. With the provided exception of building-integrated solar technologies, solar equipment should not be located forward of any point of a roof slope facing a public street, and no closer than 1/3 the depth of the main body of the roof if there is no slope toward the street (see diagrams).

COMMENTS:

The proposed guidelines for solar panels date to 2012 and were reviewed and accepted by the Fourth and Gill Neighborhood Organization Board of Directors at that time, but they were not officially approved and adopted by City Council. It is anticipated that these guidelines will be included in the next Design Guidelines update effort to be approved by City Council.

STAFF FINDINGS:

1) The solar equipment will be mounted parallel to the roof slope and not more than six inches high above the roof, as measured from the bottom of the equipment to the roof surface.

2) The solar equipment is proposed to be mounted closer than 1/3 the depth of the main body of the roof (see diagrams). The panels will be visible from Deery Street if placed on the side-gabled roof surface. If placed on the rear 2/3s of the side gabled roof, and on the back porch roof, the panels will be less noticeble. The street to the rear of the house, Morgan Street, is 50 feet away from the back of the house as shown on the accompanying map.

3) The framing equipment associated with the installation of solar technology, including brackets, edging around solar collectors, and other metal features, will be color clad with black to be made less obtrusive and to minimize contrast between the solar collectors and the roof shingles. The glass panels will be treated with an anti-reflective coating, but will still present a somewhat glossy surface.

4) No historic roofing materials or features, including the two chimneys, will be irrevocably altered or removed for the solar installation. No changes to the existing roof or siding of the house will be necessary to support the installation of the panels. No trees will be removed or pruned.

STAFF RECOMMENDATION:

Staff recommends approval of the proposed solar roof panels with the conditions that they are mounted only on the rear 2/3s of the side-gabled surface of the roof and on the rear porch roof.

HISTORIC ZONING COMMISSION

8-K-16-HZ

APPLICATION FOR CERTIFICATE OF APPROPRIATENESS

813 Deery St 37917

Fourth and Gill H-1

Original Print Date: 3/21/2016 Revised:

Metropolitan Planning Commission * City / County Building * Knoxville, TN 37902

Petitioner: Benjamin Auerbach Prime Renovations

N

0 250

Feet

Certificate (File) No: 8-K-16-HZ

APPLICATION FOR CERTIFICATE OF APPROPRIATENESS
KNOXVILLE/KNOX COUNTY HISTORIC ZONING COMMISSION

Please print all information:

1. NAME OF APPLICANT: Benjamin Miller Auerbach (on behalf of Aries Energy)

Address: 813 Deery Street, Knoxville, TN 37917

Telephone: 410-458-8026 E-mail address: auerbach@utk.edu

Relationship to Owner: Owner

2. NAME OF OWNER: Benjamin Miller Auerbach

Address: 813 Deery Street, Knoxville, TN 37917

Telephone: 410-458-8026 E-mail address: auerbach@utk.edu

3. LOCATION OF PROPERTY:

Address: 813 Deery Street Tax ID/Lot/Parcel No: Lot 409, VANGILDER & HENDERSONS ADDITION

4. LEVEL OF WORK (circle Level)

Level I Routine repair, replacement of non-original materials in-kind; removal of artificial siding or late additions; installation of gutters, storm windows/doors, screen doors, satellite dishes, or signage; demolition of a noncontributing structure; renewal of COA

Level II Major replacement of materials or architectural elements; construction of addition or outbuilding

Level III Construction of a new primary building; subdivision of individually designated property

Level IV Demolition or relocation of a contributing structure

5. DESCRIPTION OF WORK: (See Part 2 of this application for additional information that is required for submittal with the application. (A copy of all information which is submitted with an application must be retained by the Knoxville/Knox County Historic Zoning Commission.)

Installation of 18 solar panels or southeast-facing roof. Please see attached document.

6. SIGNATURE OF APPLICANT: _____ Date: 1 August 2016

Return application to: MPC, Knoxville/Knox County Historic Zoning Commission, Suite 403, City/County Building, 400 Main Street, Knoxville, Tennessee 37902 or **Fax:** 865-215-2068. **Incomplete applications will not be accepted.**

FOR STAFF USE ONLY
Date Received _____ . Approved _____ Disapproved _____ Approved As Modified _____ .
Date Acted On _____ .

Certificate of Appropriateness Application for 813 Deery Street

This document describes the proposed installation of a solar power panels to the southern-facing roof at 813 Deery Street. This system will provide approximately 5.22 kilowatts per year, and is expected to significantly offset the current electric use provided by the Knoxville Utility Board. Installation will be completed by ARiES Energy. A full copy of their proposal is attached to this application (Appendix A).

813 Deery Street is a two-story, Queen Anne period house built in 1891. For much of its early history it was a rectory for the Epiphany Episcopal Church. In successive years, it was a single-family dwelling, and then was turned into a multiple-tenant rental before being restored to a single-family dwelling in the 1990s. Throughout this history, most of the original features of the house have been preserved, including its four mantels, built-in cabinets in the kitchen, fifteen stained-glass windows, and wood details throughout the house.

The Fourth and Gill Neighborhood Organization Board of Directors approved guidelines for the installation of solar panels in 2012 (attached as Appendix B). These guidelines have not yet been adopted into the Design Guidelines by the city government, as they await being added after a more complete revision of the neighborhood guidelines is considered. Nevertheless, all attempts have been made to cohere to the guidelines adopted in 2012 by the neighborhood organization.

The design of the system has been made in an attempt to minimize the impact on the visual character of the house while optimizing the power production of the solar system. The proposed installation of solar panels will be on the south-facing aspect of the house, which faces the house at 811 Deery Street (Figure 1). This installation will consist of 17 300-watt panels, each 39.4” x 65.95”. They will be flush-mounted to a rail system attached to the roof, and will project less than six inches total above the roof. See Figures 2-5 for renderings of the solar panel installation as viewed from the southeastern view from the street. All materials (rails and solar panel framing) will be black to match the color of the roof. They also have an anti-glare finish that will minimize their reflectivity. An inverter and second power meter will be installed on the side of the house alongside the existing power meter and above the power box.

It is not anticipated that the installation of the solar panels will have any irreversible structural or visual impacts on the house. The roof on 813 Deery Street is not composed of historic roofing materials, and has no historic features remaining except for two chimneys, neither of which will be impacted by the solar panel installation. No changes to the existing roof or siding of the house will be necessary to support the installation of the panels. No trees will be removed or pruned.

ARiES Energy and the owner (Benjamin Auerbach) have initiated a Participation Agreement Request with the TVA Green Power Providers program. It is anticipated that this request will be granted within the next three weeks, which will grant permission to have the system installed and connected to the power grid.

Figure 1. Existing (a) southern and (b) front elevations of 813 Deery Street

(a)

(b)

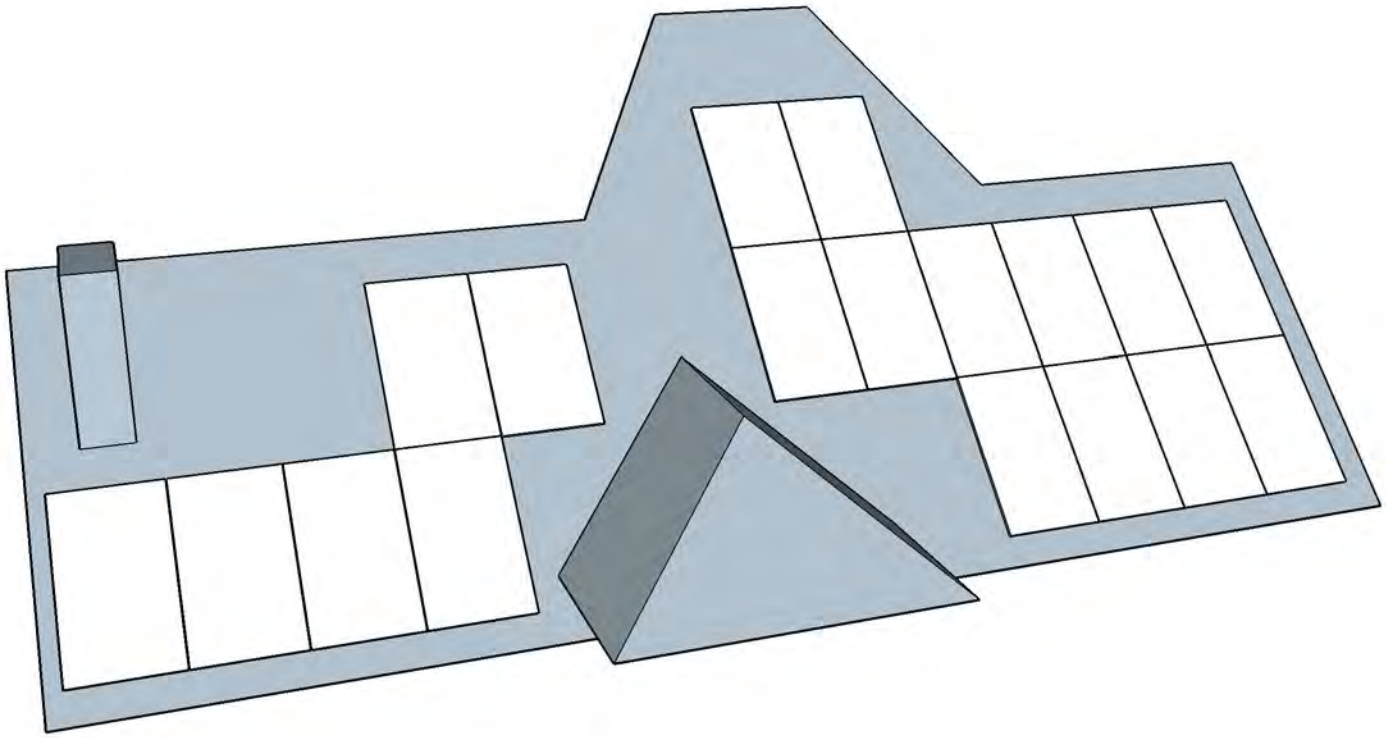
Figure 2. Southeastern elevation of 813 Deery Street with rendering of solar panel installation. Note that solar panel framing and rails will be black in the final installation.

Figure 3. Close up rendering of installation of solar panel system on 813 Deery Street

Figure 4. Rendering of the installation as viewed from the sidewalk in front on 811 Deery Street.

Figure 5. Close up detail of Figure 4.

APPENDIX A



ARiESENERGY
RESOURCEFULLY POWERING THE WORLD

Conceptual Drawing
Client: Ben Auerbach
Address: 813 Deery Street
Knoxville, TN 37917
18 Solarworld 290W Black Modules - 5.22 kW
Roof Mounted - DPW PowerRail Racking

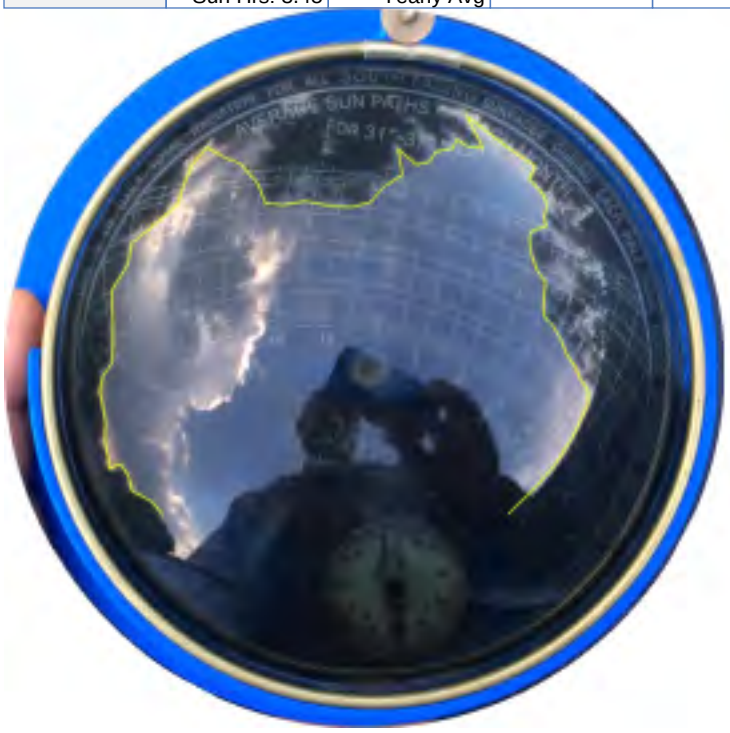
ARiES Energy
Solar Site Analysis Report

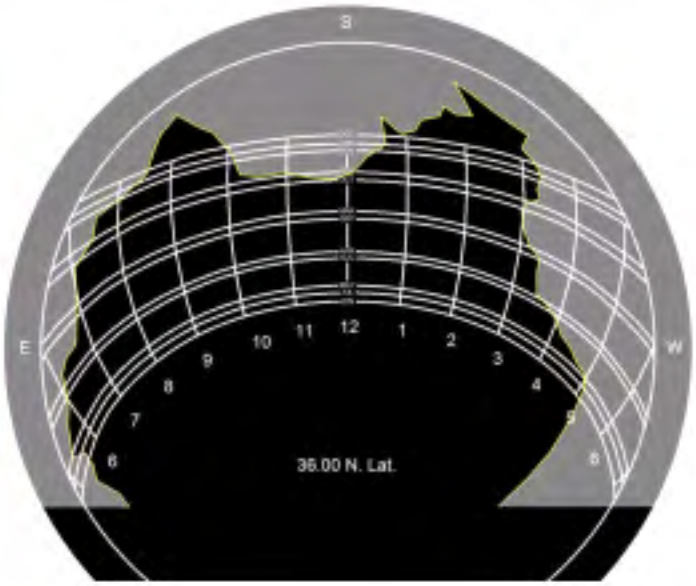
Layout Point 1

Image File: File_000.jpeg

Solar Obstruction Data

Month	Actual Shaded Solar Radiation Azimuth=211.3 Tilt=45.0 kWh/m²/day	Unshaded % of Actual Site Azimuth=211.3 Tilt=45.0	Actual Shaded AC Energy (kWh) Azimuth=211.3 Tilt=45.0	Actual Unshaded AC Energy (kWh) Azimuth=211.3 Tilt=45.0
January	1.62	49.3 %	224.07	458.89
February	2.48	63.2 %	307.16	488.22
March	3.49	75.3 %	463.95	614.65
April	4.27	79.8 %	533.81	667.08
May	4.53	91.6 %	576.71	626.49
June	4.84	91.7 %	586.67	635.67
July	4.78	91.4 %	588.11	636.92
August	4.34	81.5 %	537.70	658.82
September	3.93	79.2 %	479.38	602.77
October	3.48	78.1 %	446.15	570.90
November	2.05	53.6 %	264.64	494.62
December	1.56	48.5 %	205.18	430.54
Totals	41.38 Effect: 72.3 % Sun Hrs: 3.45	76.0 % Unweighted Yearly Avg	5,213.53	6,885.58





Notes: [None]

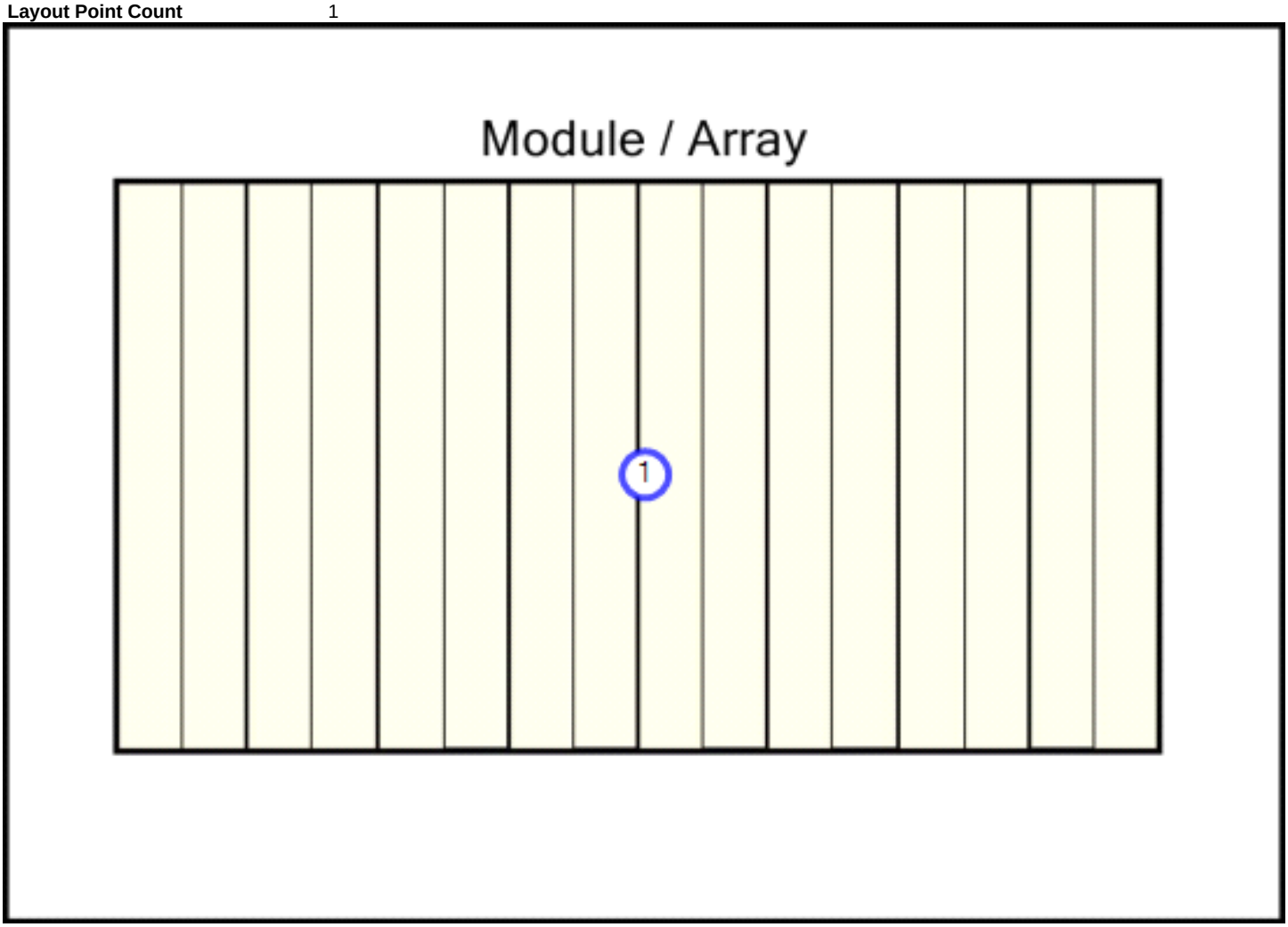
ARiES Energy
Site Report

Report Name	
Report Date	7/20/2016
Declination	-5d 42m
Location	Knoxville, TN 37917
Lat/Long	35.995 / -83.917
Weather Station	Knoxville-McGhee Tyson AP, TN, Elevation: 961 Feet, (35.817 / -83.983)
Site Distance	13 Miles
Report Type	PV
Array Type	Fixed Angle
Tilt Angle	45.00 deg
Ideal Tilt Angle	36.00 deg
Azimuth	211.30 deg
Ideal Azimuth	180.00 deg
Electric Cost	0.1 ($/kWh)
Module Make	SolarWorld
Module Model	SW 290 Mono
Module Type	Standard
Module Count	18
DC Rate (per module)	290.0 Watts
TSRF	72.3 %
STC System Size	5.22 kW
Inverter Make	SolarEdge Technologies
Inverter Model	SE5000 (240V) w/ -ER-US or A-US
Inverter Count	1
Inverter Efficiency	98.0 %
System Loss Percentage	11.4 %
AC Energy Efficiency	71.5 %
Layout Configuration	Single Picture
Layout Point Count	1

Notes: [None]

ARiES Energy
System Picture Layout

Layout Type	Single Picture
Layout Point Count	1



ARiES Energy
Summary Report

Solar Obstruction Data

Month	Actual Shaded Solar Radiation Azimuth=211.3 Tilt=45.0 kWh/m²/day	Unshaded % of Actual Site Azimuth=211.3 Tilt=45.0	Actual Shaded AC Energy (kWh) Azimuth=211.3 Tilt=45.0	Actual Unshaded AC Energy (kWh) Azimuth=211.3 Tilt=45.0
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Notes: [None]

ENERGY SOLUTION - SOLAR PV

A PROPOSAL TO: Ben Auerbach

ON: 8/8/16

PROPERTY LOCATION: 813 Deery St Knoxville, TN 37917

GENERATE REVENUE

Get paid by your utility company!

ADD VALUE TO YOUR PROPERTY

Maximize the value of your roof!

PROTECT THE ENVIRONMENT

Energy without a carbon emission!

SYSTEM SIZE AND PRODUCTION

System Size		**5.22 kW**
Annual production		**5214.78 kWh**

This system will generate:

Annual Revenue of **based on $.10 retail*	**$**	**521.48**
Revenue Over 20 Years **with 2% annual increase in retail rate*	**$**	**12,607.65**

This system will cost:

Out of Pocket Payment	**$**	**16,223.00**

Incentives

Federal Tax Credit (30%)	**-$**	**4,866.90**
Final Cost	**$**	**11,356.10**

OTHER INFORMATION

SCOPE OF WORK

18 Solworld SW 290 Black Modules *25 Year Warranty for 80% of Original Production*

18 Solaredge P300 DC Power Optimizers

Solaredge SE5000A-US Inverter with Power Optimizers *12 Year Warranty*

http://www.solaredge.us/files/pdfs/products/inverters/se-single-phase-us-inverter-datasheet

DPW Roof Mounting

SolarEdge Online Production Monitoring

INCENTIVE INFORMATION

TVA Green Power Providers Program

http://www.tva.com/greenpowerswitch/providers/participant

TIMELINE

Submit CRR to TVA Green Power Providers Program, wait for approval

Conduct technical site vist and shading analysis, review secondary proposal

After CRR approval finalize TVA and local utility paperwork

After PA approval, TVA GPP participant has 180 days to comission system

ARiES Energy estimates no more than 3 months to finalize plans, secure financing, and order materials

After above steps have been completed no more than 2 weeks of physical installation

Sunmodule® Plus
SW 275-290 MONO BLACK

SOLARWORLD
REAL VALUE

TUV Power controlled:
Lowest measuring tolerance in industry

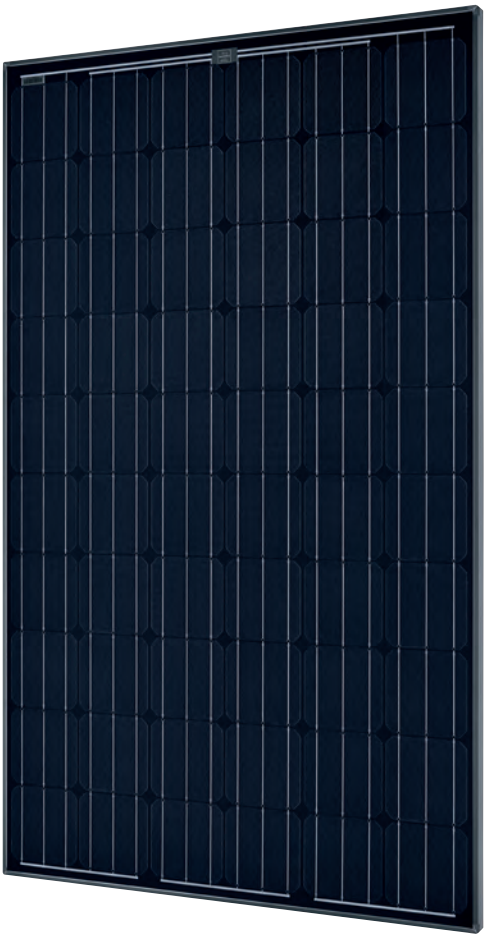
Every component is tested to meet
3 times IEC requirements

Designed to withstand heavy
accumulations of snow and ice

Sunmodule Plus:
Positive performance tolerance

25-year linear performance warranty
and 10-year product warranty

Glass with anti-reflective coating



World-class quality
Fully-automated production lines and seamless monitoring of the process and material ensure the quality that the company sets as its benchmark for its sites worldwide.

SolarWorld Plus-Sorting
Plus-Sorting guarantees highest system efficiency. SolarWorld only delivers modules that have greater than or equal to the nameplate rated power.

25-year linear performance guarantee and extension of product warranty to 10 years
SolarWorld guarantees a maximum performance digression of 0.7% p.a. in the course of 25 years, a significant added value compared to the two-phase warranties common in the industry, along with our industry-first 10-year product warranty.**

* Solar cells manufactured in U.S.A. or Germany. Modules assembled in U.S.A.
** in accordance with the applicable SolarWorld Limited Warranty at purchase.
www.solarworld.com/warranty

- Qualified, IEC 61215
- Safety tested, IEC 61730
- Blowing sand resistance, IEC 60068-2-68
- Ammonia resistance, IEC 62716
- Salt mist corrosion, IEC 61701
- Periodic inspection

- Periodic inspection
- Power controlled

UL 1703

ISO 9001
ISO 14001
Certified

Home Innovation
NGBS GREEN CERTIFIED

MADE IN USA
OF US & IMPORTED PARTS*

solarworld.com

Sunmodule® Plus
SW 275-290 MONO BLACK

SOLARWORLD
REAL VALUE

PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)*

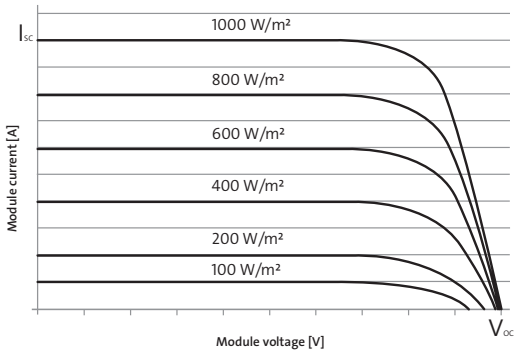
		SW 275	SW 280	SW 285	SW 290
Maximum power	P_{max}	275 Wp	280 Wp	285 Wp	290 Wp
Open circuit voltage	V_{oc}	39.4 V	39.5 V	39.7 V	39.9 V
Maximum power point voltage	V_{mpp}	31.0 V	31.2 V	31.3 V	31.4 V
Short circuit current	I_{sc}	9.58 A	9.71 A	9.84 A	9.97 A
Maximum power point current	I_{mpp}	8.94 A	9.07 A	9.20 A	9.33 A
Module efficiency	η_m	16.40 %	16.70 %	17.00 %	17.30 %

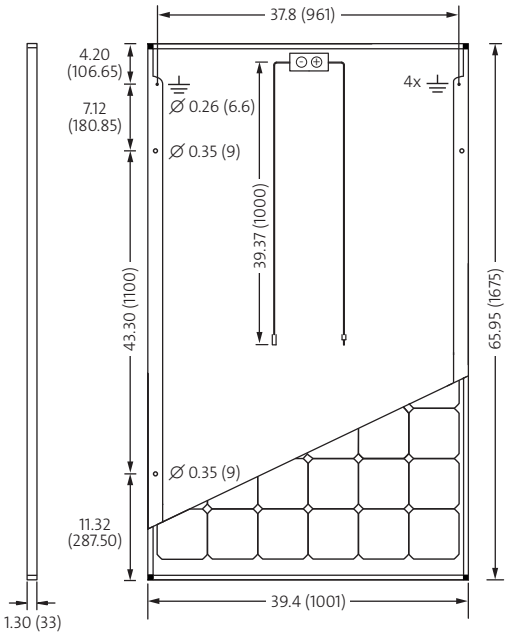
*STC: 1000W/m², 25°C, AM 1.5

PERFORMANCE AT 800 W/M², NOCT, AM 1.5

		SW 275	SW 280	SW 285	SW 290
Maximum power	P_{max}	203.1 Wp	207.2 Wp	211.1 Wp	215 Wp
Open circuit voltage	V_{oc}	35.7 V	35.8 V	36.0 V	36.2 V
Maximum power point voltage	V_{mpp}	28.1 V	28.3 V	28.4 V	28.5 V
Short circuit current	I_{sc}	7.75 A	7.85 A	7.96 A	8.06 A
Maximum power point current	I_{mpp}	7.22 A	7.33 A	7.43 A	7.54 A

Minor reduction in efficiency under partial load conditions at 25° C: at 200 W/m², 100% of the STC efficiency (1000 W/m²) is achieved.





COMPONENT MATERIALS

Cells per module	60	*Front*	Low-iron empered glass with ARC (EN 12150)
Cell type	Monocrystalline	*Frame*	Black anodized aluminum
Cell dimensions	6.17 in x 6.17 in (156.75 x 156.75 mm)	*Weight*	39.7 lbs (18.0 kg)

THERMAL CHARACTERISTICS

NOCT	48 °C
TCI_{sc}	0.044 % / °C
TCV_{oc}	-0.31 % / °C
TCP_{mpp}	-0.44 % / °C
Operating temp	-40 to +85 °C

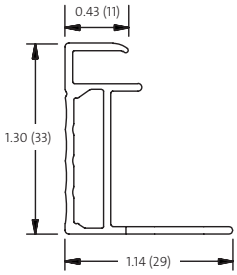
ADDITIONAL DATA

Power sorting	-0 Wp/+5 Wp
J-Box	IP65
Connector	PV wire per UL4703 with H4/UTX connectors
Module fire performance	(UL 1703) Type 1

PARAMETERS FOR OPTIMAL SYSTEM INTEGRATION

Maximum system voltage SC II / NEC		1000 V
Maximum reverse current		25 A
Number of bypass diodes		3
*Design loads**	*Two rail system*	113 psf downward, 64 psf upward
*Design loads**	*Three rail system*	178 psf downward, 64 psf upward
*Design loads**	*Edge mounting*	178 psf downward, 41 psf upward

* Please refer to the Sunmodule installation instructions for the details associated with these load cases.



- Compatible with both "Top-Down" and "Bottom" mounting methods
- ⏚ Grounding Locations:
  – 4 locations along the length of the module in the extended flange.

All units provided are imperial. SI units provided in parentheses.
SolarWorld AG reserves the right to make specification changes without notice.

APPENDIX

CASH FLOW STATEMENT

Energy Cost Escalation Rate: **2.00%**

YEAR	BEGINNING BALANCE	SYSTEM REBATES	SOLAR REVENUE	% ROI NET
1	-$16,223.00	$4,866.90	$521.48	33%
2	-$10,834.62		$531.65	5%
3	-$10,302.98		$542.01	5%
4	-$9,760.96		$552.58	5%
5	-$9,208.38		$563.36	5%
6	-$8,645.02		$574.34	5%
7	-$8,070.68		$585.54	5%
8	-$7,485.13		$596.96	6%
9	-$6,888.17		$608.60	6%
10	-$6,279.57		$620.47	6%
11	-$5,659.10		$632.57	6%
12	-$5,026.53		$644.90	6%
13	-$4,381.62		$657.48	6%
14	-$3,724.14		$670.30	6%
15	-$3,053.84		$683.37	6%
16	-$2,370.47		$696.70	6%
17	-$1,673.77		$710.28	7%
18	-$963.49		$724.13	7%
19	-$239.35		$738.25	7%
20	$498.90		$752.65	7%

EXAMPLE LOAN

Loan Term (Years) 20

Interest Rate 3.50%

Down Payment $4,866.90

Year	LOAN BALANCE	SYSTEM REBATES	LOAN PAYMENT	SOLAR REVENUE	NET CASH FLOW
1	$10,022.01	$4,866.90	-$501.10	$521.48	$4,887.28
2	$9,520.91		-$501.10	$531.65	$30.55
3	$9,019.81		-$501.10	$542.01	$40.91
4	$8,518.71		-$501.10	$552.58	$51.48
5	$8,017.61		-$501.10	$563.36	$62.26
6	$7,516.51		-$501.10	$574.34	$73.24
7	$7,015.41		-$501.10	$585.54	$84.44
8	$6,514.31		-$501.10	$596.96	$95.86
9	$6,013.21		-$501.10	$608.60	$107.50
10	$5,512.10		-$501.10	$620.47	$119.37
11	$5,011.00		-$501.10	$632.57	$131.47
12	$4,509.90		-$501.10	$644.90	$143.80
13	$4,008.80		-$501.10	$657.48	$156.38
14	$3,507.70		-$501.10	$670.30	$169.20
15	$3,006.60		-$501.10	$683.37	$182.27
16	$2,505.50		-$501.10	$696.70	$195.60
17	$2,004.40		-$501.10	$710.28	$209.18
18	$1,503.30		-$501.10	$724.13	$223.03
19	$1,002.20		-$501.10	$738.25	$237.15
20	$501.10		-$501.10	$752.65	$251.55

This financial model has built in assumptions. An accurate final price can only be provided after a detailed site visit and communication with the local Authorities having Jurisdiction. Items that may affect the final price may include but are not limited to: relocation/new utility service drop, exceedingly long wire runs from & between equipment, roof warranty claims/certifications, and working conditions/locations that limit access or require use of specialized equipment.

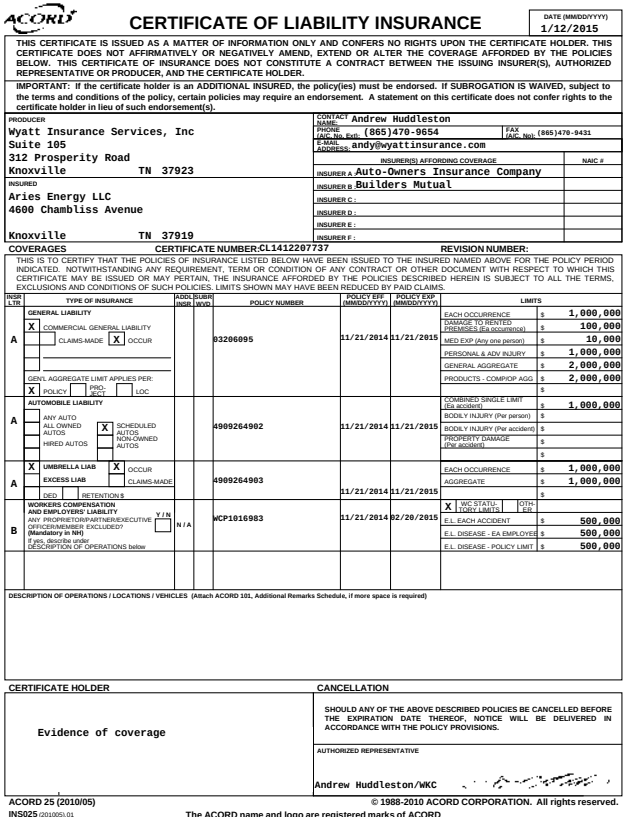
The information presented here provides an unofficial overview of financial incentives and other policies. It does not constitute professional tax advice or other professional financial guidance, and it should not be used as the only source of information when making purchasing decisions, investment decisions or tax decisions, or when executing other binding agreements.

REFERENCES AND QUALIFICATIONS

RANDY DEBORD
Owner
McFarland Medical, Inc.
(423) 586-2500

TED L. WAMPLER, JR.
President and COO
Wampler's Farm Sausage
(865) 986-2056

LAWRENCE AND ANGELA CARICO
Owner of 7kW Residential Solar System
(865) 457-7804



ACORD

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 1/12/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Wyatt Insurance Services, Inc
Suite 105
312 Prosperity Road
Knoxville TN 37923

CONTACT NAME: Andrew Huddleston
PHONE (A/C, No, Ext): (865)470-9654 FAX (A/C, No): (865)470-9431
E-MAIL ADDRESS: andy@wyattinsurance.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A: Auto-Owners Insurance Company	
INSURER B: Builders Mutual	
INSURER C:	
INSURER D:	
INSURER E:	
INSURER F:	

INSURED
Aries Energy LLC
4600 Chambliss Avenue
Knoxville TN 37919

COVERAGES CERTIFICATE NUMBER: CL1412207737 REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE / X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY / PRO-JECT / LOC			03206095	11/21/2014	11/21/2015	EACH OCCURRENCE	$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 1,000,000
							GENERAL AGGREGATE	$ 2,000,000
							PRODUCTS - COMP/OP AGG	$ 2,000,000
								$
A	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS HIRED AUTOS X SCHEDULED AUTOS NON-OWNED AUTOS			4909264902	11/21/2014	11/21/2015	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
							BODILY INJURY (Per person)	$
							BODILY INJURY (Per accident)	$
							PROPERTY DAMAGE (Per accident)	$
								$
A	X UMBRELLA LIAB / X OCCUR EXCESS LIAB / CLAIMS-MADE DED / RETENTION $			4909264903	11/21/2014	11/21/2015	EACH OCCURRENCE	$ 1,000,000
							AGGREGATE	$ 1,000,000
								$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N N/A If yes, describe under DESCRIPTION OF OPERATIONS below			WCP1016983	11/21/2014	02/20/2015	X WC STATU-TORY LIMITS / OTH-ER	
							E.L. EACH ACCIDENT	$ 500,000
							E.L. DISEASE - EA EMPLOYEE	$ 500,000
							E.L. DISEASE - POLICY LIMIT	$ 500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

CERTIFICATE HOLDER
Evidence of coverage

CANCELLATION
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
Andrew Huddleston/WKC

ACORD 25 (2010/05)
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INSTALLED CAPACITY AS OF 8/8/16

447 kW

State of Tennessee 32316 10097114

BOARD FOR LICENSING CONTRACTORS

CONTRACTOR

PHG MANAGEMENT SERVICES, LLC

This is to certify that all requirements of the State of Tennessee have been met.

ID NUMBER: 65924
LIC STATUS: ACTIVE
EXPIRATION DATE: May 31, 2018
AGLM UNLIMITED; BC-B ; BC-C

IN-1313
DEPARTMENT OF COMMERCE AND INSURANCE

MEMBER QUALITY CONTRACTOR NETWORK

energyright solutions TVA

PHG Energy

is now on the TVA master list of contractors that have qualified for Quality Contractor Network (QCN) membership. The QCN is committed to the promotion and authorized installation of quality weatherization and HVAC measures including air sealing, insulation, windows and qualified HVAC systems for residential customers through the TVA energy right solutions™ program.

Christopher K Smith — Signature
January 26, 2016 — Date
#547713 — QCN Number

NABCEP
Raising Standards. Promoting Confidence.

PHOTOVOLTAIC ENTRY LEVEL EXAM
PASSING SCORE ACHIEVEMENT

Tait Beaty

The individual named above has demonstrated a basic knowledge of the fundamental principles of the application, design, installation and operation of grid-tie and stand-alone photovoltaic systems.

10/09/2013
DATE

Richard Lawrence, Executive Director

TERMS AND CONDITIONS

Any alteration or deviation from above specifications involving extra costs, will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements are contingent upon strikes, accidents or delays beyond our control. Owner is to carry fire, tornado and other necessary insurance upon above work.

ARiES Energy, LLC
4600 Chambliss
Knoxville, TN 37919

SOLAR (PV & THERMAL)

This Cost Estimate does not include labor or materials for roof construction or upgrades, structural assessments or upgrades and engineering or engineering requirements. The Cost Estimate does not include labor or materials for upgrades to the existing electrical systems that may be required in order for interconnection with utility grid. The Cost Estimate does not include labor or materials for upgrades to the existing networking or internet delivery system that may be required in order for the PV system to be commissioned. The system specified in this proposal depends upon the availability of the PV panels, inverter(s), mounting systems and other equipment. Should any of the equipment not be available, an equivalent replacement will be used.

The quoted cost(s) is valid for 15 days from the proposal date. If an invoice is not paid in full upon completion, the invoice will be assessed with a service charge of 1.5% per month, which calculates to 18% per year. If the collection process becomes necessary, any and all legal fees will be added to the uncollected amount and the process of collection will take place in Knox County, Tennessee.

PAYMENT TERMS

- 20% Due at Signing
- 50% Due at Materials Order
- 15% Due at Start of Construction
- 15% Due When the System is Selling Power

ACCEPTANCE OF PROPOSAL

The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

ARiES Energy, LLC proposes to design, build, and install a 5.22 kilowatt (kW) solar photovoltaic (PV) system located at: 813 Deery St Knoxville, TN 37917

Total System Price Including Estimated Sales Tax:	**$ 16,223.00**	**Certain utiilties and municipalities may require additional fees not included in this proposal for engineering and interconnection*

Print_____ Print_____

Sign_____ Sign_____

Date_____ Date_____

APPENDIX B

Solar

Contemporary solar additions to building roofs have no historic counterpart and make a strong impact of the visual character of existing buildings. While both goals of historic preservation and energy conservation are important, care must be taken that one is not achieved at the expense of the other.

In designing and obtaining permission to install solar technology on a historic home, applicant is to consider the following preferences and requirements for design and placement of solar devices. These provisions are designed to minimize irreversible visual and structural impact of the devices on the historic appearance of the building.

Historic Zoning Commission is under no obligation to approve projects that do not adhere strictly to these guidelines, and may require that more preferred alternatives be pursued as a condition of project approval.

Applicant must provide manufacturer's pamphlets showing a typical installation, and a full rendering of the installation showing the visual impact on the historic building.

Preferences

It is preferred that mature trees not be removed in order to increase sun exposure for a solar installation.

Requirements

Solar technology should not be visible from public streets or, if visible, should be installed on an accessory building, a rear facing elevation, or a side elevation that does not face onto a public street.
Exception:
In the event that street-facing elevations are the only reasonable placement possible, the solar installation should be non-reflective and fully integrated with the building envelope or cladding.

In all cases, regardless of the location of the solar installation -

1. Solar collectors and mounting systems should be compatible in color to the property's roof materials.

2. Framing equipment associated with the installation of solar technology, including brackets, edging around solar collectors, and other metal features, should be treated, color clad, or covered to be made as unobtrusive as possible and to minimize contrast between the solar collectors and equipment and any roofing materials.

3. Slope, elevation and position relative to existing architectural features should be minimally visible from public streets.

4. Historic roofing materials or features, including dormers and chimneys, may not be irrevocably altered or removed for the solar installation.

5. For free-standing solar installations:
   a. Collectors should be located in the rear yard and should not be located in either front or side yards. Specific locations should be chosen to minimize visibility from all public streets.
   b. Free-standing, pole-mounted systems should be placed a distance equal to at least 110% of their height from property lines.

6. For roof-mounted solar installations:
   a. On a sloped roof:
      The solar equipment should be mounted parallel to the roof slope and not more than six inches above the roof, as measured vertically from the top of the equipment to the roof surface. With the provided exception of building-integrated solar technologies, solar equipment should not be located forward of any point of a roof slope facing a public street or closer than 1/3 the depth of the main body of the roof if there is no slope toward the street (see diagrams)
   b. On a flat roof:
      The equipment should be set back from the roof edge, and visibility from ground level should be minimal.

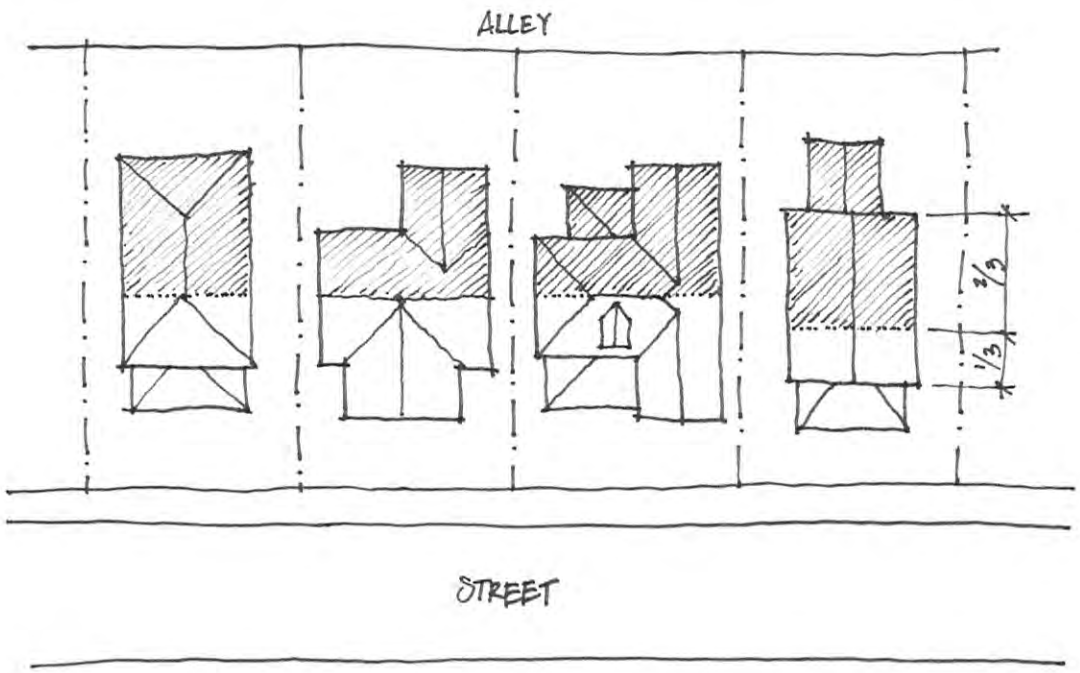
Wind Technology

In designing and obtaining permission to install wind technology, applicant should adhere to the following requirements for design and placement of wind devices. These provisions are designed to minimize the visual and irreversible impact of the devices on the historic appearance and integrity of the building and property.

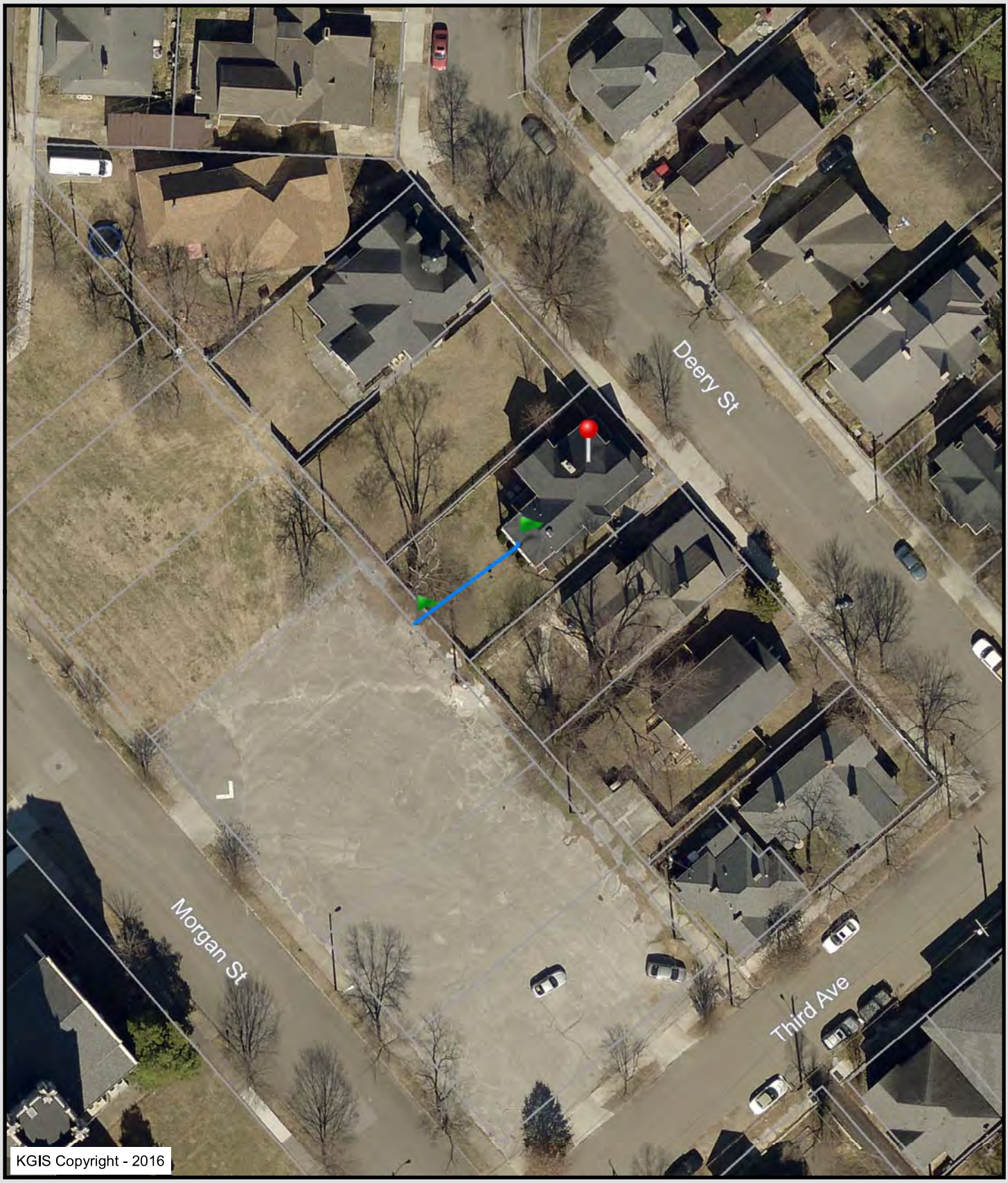
1. Wind turbines that are directly attached to the home or other historic structure are prohibited.

2. Free-standing turbines or other wind energy systems should not be installed in yards adjacent to the public street or right-of-way.

3. Free-standing, pole-mounted systems should be placed a distance equal to at least 110% of the height of the pole away from property lines and historic structures.



SHADING INDICATES ACCEPTABLE SOLAR LOCATION



813 Deery Street

4th and Gill H-1

aerial showing parking lot 50 feet to rear

Knoxville - Knox County - KUB Geographic Information System

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0 25 50 100

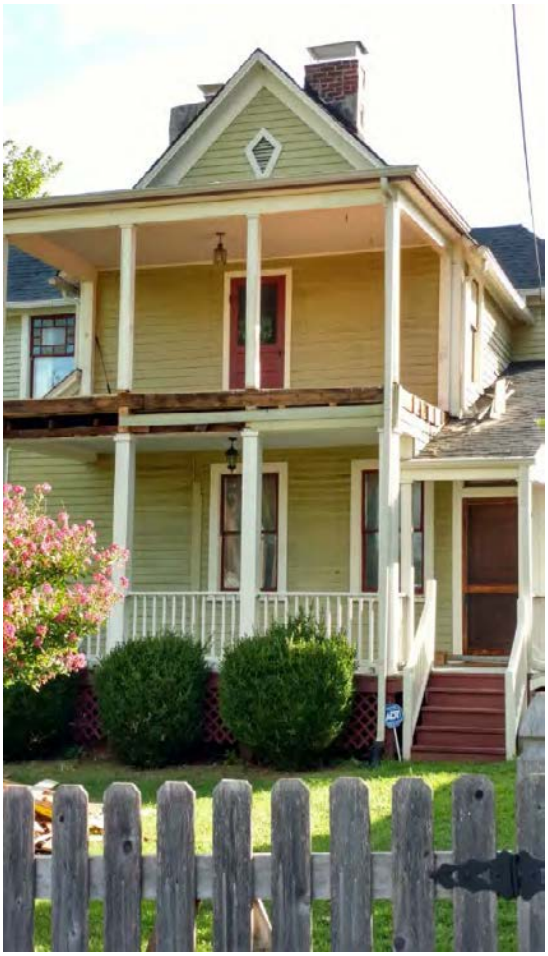
ft

813 Deery Street showing the streetscape when approaching from the southeast

813 Deery Street approaching from the northwest

813 Deery Street rear façade as viewed from parking lot along Morgan Street - looking northwest

813 Deery Street rear façade as viewed from Morgan Street (~150 away)



813 Deery close-up from rear of house standing in parking lot. (~50 away)