WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

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June 30, 2022
revised August 15, 2022

Lumio Solar
12600 Challenger Parkway, Suite 200
Orlando, FL 32826

Scott Wyssling, PE

Digitally signed by Scott Wyssling, PE
DN: C=US, S=Utah, L=Alpine, O=Wyssling Consulting, OU=Engineering, CN="Scott Wyssling, PE", E=swyssling@wysslingconsulting.com
Reason: I am the author of this document
Location: your signing location here
Date: 2022.08.15 11:09:32-06'00'
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Re: Engineering Services
Wilson Residence
169 Southwest Friendship Way, Lake City FL
12.400 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

A. Site Assessment Information

1. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.

B. Description of Structure:

Roof Framing:	Prefabricated wood trusses at 24" on center. All truss members are constructed of 2 x 4 dimensional lumber.
Roof Material:	Composite Asphalt Shingles
Roof Slopes:	27 +/- degrees
Attic Access:	Accessible
Foundation:	Permanent

C. Loading Criteria Used

- **Dead Load**
  - Existing Roofing and framing = 7 psf
  - New Solar Panels and Racking = 3 psf
  - TOTAL = 10 PSF
- **Live Load** = 20 psf (reducible) – 0 psf at locations of solar panels
- **Ground Snow Load** = 0 psf
- **Wind Load** based on ASCE 7-16
  - Ultimate Wind Speed = 120 mph (based on Risk Category II)
  - Exposure Category B

Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the FBC 2020 7th Edition, including provisions allowing existing structures to not require strengthening if the new loads do not exceed existing design loads by 105% for gravity elements and 110% for seismic elements. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.

D. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent Unirac installation manual. If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. The maximum allowable withdrawal force for a $^{5}/_{16}$" lag screw is 235 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of 2½", the allowable capacity per connection is greater than the design withdrawal force (demand). Considering the variable factors for the existing roof framing and installation tolerances, the connection using one $^{5}/_{16}$" diameter lag screw with a minimum of 2½" embedment will be adequate and will include a sufficient factor of safety.
3. Considering the wind speed, roof slopes, size and spacing of framing members, and condition of the roof, the panel supports shall be placed no greater than 48" on center.
4. Panel supports connections shall be staggered to distribute load to adjacent framing members.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the *FBC 2020 7th Edition*, current industry standards and practice, and is based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,

Scott E. Wyssling, PE
Florida License No. 81558

THIS PLAN HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY SCOTT WYSSLING, PE USING A DIGITAL SIGNATURE AND DATE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES

SCOTT E WYSSLING
LICENSE
No. 81558
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Wyssling Consulting, PLLC
76 N Meadowbrook Drive Alpine UT 84004
Florida License # RY34912

Date Signed 08-15-22

LEGEND

X - MODULE STRING ID	LC - LOAD CENTER
(E) - EXISTING	SP - SUBPANEL
(N) - NEW	JB - JUNCTION BOX
M - UTILITY METER	SCT - STRING CENTER TAP
MSP - MAIN SERVICE PANEL	----- - CONDUIT
ACD - AC DISCONNECT	BAT - ENERGY STORAGE
CB - COMBINER BOX	ICD - INTERCONNECTION DEVICE
	BUL - BACK UP LOADS PANEL

ADHESIVE FASTENED SIGNS:

- ANSI Z535.4-2011 PRODUCT SAFETY SIGNS AND LABELS, PROVIDES GUIDELINES FOR SUITABLE FONT SIZES, WORDS, COLORS, SYMBOLS, AND LOCATION REQUIREMENTS FOR LABELS. NEC 110.21(B)(1).
- THE LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. NEC 110.21(B)(3).
- ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT.

WARNING
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL LOCATION:
COMBINER BOX/ EMT ENCLOSURES/ AC DISCONNECT/ MAIN SERVICE PANEL
PER CODE: NEC 2017, 690.13(B)

EMERGENCY RESPONDER
SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN THE ENTIRE PV SYSTEM

LABEL LOCATION:
RAPID SHUTDOWN (AC DISCONNECT)
PER CODE: NEC 690.56 (C)(1) & NFPA1 11.12.2.1.1.1.1, 11.12.2.1.4

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
CONDUIT/ RACEWAY/ ENCLOSURES/ COMBINER BOX/ AC DISCONNECT
PER CODE: NEC2017, 690.31(G)(3)(4)

PHOTOVOLTAIC AC DISCONNECT

LABEL LOCATION:
AC DISCONNECT/ BREAKER/ POINTS OF CONNECTION
PER CODE: NEC2017, 690.13(B)

PHOTOVOLTAIC AC DISCONNECT
RATED AC OUTPUT CURRENT 37.5 A
NOMINAL OPERATING AC VOLTAGE 240 V

LABEL LOCATION:
AC DISCONNECT
PER CODE: NEC2017, 690.53

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION:
RAPID SHUTDOWN (AC DISCONNECT)
PER CODE: NEC 690.58 (C)(3)

WARNING
DUAL POWER SOURCE
SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL LOCATION:
POINT OF INTERCONNECTION
PER CODE: NEC 2017, 705.12(B)

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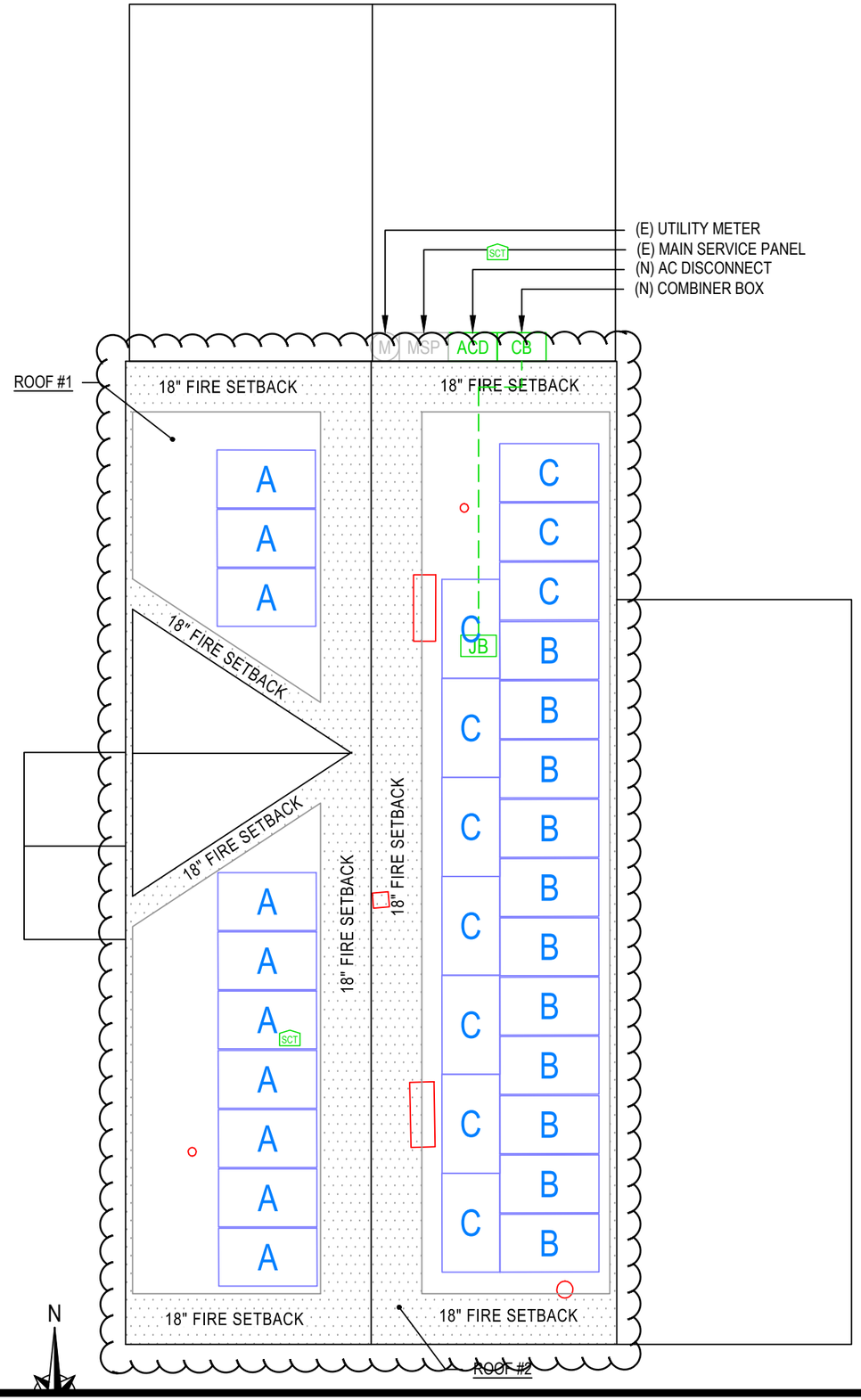

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SCOTT E WYSSLING LICENSE No. 81558 STATE OF FLORIDA PROFESSIONAL ENGINEER

Wyssling Consulting, PLLC
76 N Meadowbrook Drive Alpine UT 84004
Florida License # RY34912

Date Signed 08-15-22

1 | ROOF PLAN WITH STRING LAYOUT
E-1 | SCALE: NTS

AKE SOLAR

ATLANTIC KEY ENERGY LLC
7006 STAPOINT CT
STE B
WINTER PARK, FL 32792
+1 (407) 988-0273

PROJECT NAME & ADDRESS

CHRISTINE WILSON
RESIDENCE
169 SW FRIENDSHIP WAY
LAKE CITY, FL 32024

ENGINEER CONTACT INFORMATION

SCOTT WYSSLING
LICENSE# 81558
76 N MEADOWBROOK DR.,
ALPINE, UT 84004

SIGNATURE WITH SEAL

REVISIONS

DESCRIPTION	DATE	REV
LAYOUT CHANGE	8/9/22	A

Drawn by:	D.G.
Checked by:	S.W.
Date:	6/28/22

SHEET NAME
STRING LAYOUT & SIGNAGE

SHEET NUMBER
E-1