UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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AFFORDABLE WIRE MANAGEMENT, LLC,
Petitioner,

v.

CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND HANDICAPPED, INC.,
Patent Owner.

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IPR2024-00139
Patent 10,177,551

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**DECLARATION OF WILLIAM F. BROOKS, PE**
**IN SUPPORT OF PATENT OWNER'S RESPONSE**

I, William F. Brooks, declare as follows:

## I. Introduction

1. I am a licensed Electrical Professional Engineer and Mechanical Professional Engineer in California, and currently the Principal Engineer of Brooks Engineering, located in Vacaville, CA. I founded Brooks Engineering in 2005 to provide consulting engineering services to a wide variety of clients in the solar/photovoltaic (PV) industry.

2. My career in the PV industry spans thirty-six (36) years. I am considered to be one of the foremost experts in the PV industry. My work has been in all segments of the PV industry, including, specifically, including design, development and installation of utility-scale solar plants. My experience in the area of utility-scale solar plants has included substantial field experience, having inspected and visited dozens of utility-scale solar plants throughout my career. I have provided training to more than 17,000 electricians, PV system installers, building officials, and inspectors. In addition, I have acted as a consultant for the design and installation of PV systems. I have written multiple guides and articles regarding the design, installation, maintenance, and safety of PV systems that continue to be relied upon by industry installers, inspectors, and owners. A core focus of my career in the PV industry is code development and compliance, including the National Electric Code (NEC), Institute of Electrical and Electronics

Engineers (IEEE), and National Fire Protection Association (NFPA) standards. As a result of my mastery of these standards, some of which I personally drafted myself, I am regularly consulted by clients and customers to assist with navigating code issues and ensuring that PV systems, including utility-scale solar plants, are compliant with safety and code requirements.

3. I am providing this declaration in support of the Patent Owner's Response of Cambria County Association for the Blind and Handicapped, Inc. ("CAB") in connection with IPR2024-00178, concerning U.S. Patent No. 11,349,291 (the "'291 Patent"), and IPR2024-00139, concerning U.S. Patent No. 10,177,551 (the "'551 Patent"), both pending before the U.S. Patent and Trademark Office, Patent Trial and Appeal Board (the "Board").

4. I understand that CAB obtained a patent from the United States Patent and Trademark Office (USPTO) for its above-ground messenger wire supported cable management system using messenger wire supported cable hangers to support and separate the various kinds of electrical cables within a solar installation array. I understand that the '291 Patent relates to CAB's above-ground messenger wire supported cable management system.

5. I further understand that CAB obtained a patent from the USPTO for its integrated grounding system that uses a messenger wire both as a support structure to support cable hangers and electrical cables and as an equipment

grounding conductor for the system. I understand that the '551 Patent relates to CAB's integrated grounding system.

6. I understand that Petitioner Affordable Wire Management, LLC ("AWM") filed two petitions for *inter partes* review (the "Petition") to challenge the validity of the claims of the '291 Patent and the '551 Patent.

7. I am personally knowledgeable about the matters stated herein and am competent to make this declaration. The information presented herein is based on my knowledge, background, education, training, and experience in the solar industry.

8. The following is my written declaration concerning my knowledge of CAB's above-ground cable management system that it introduced to the solar industry in the 2013 timeframe. CAB's above-ground cable management system was the first cable management system in the solar industry to use messenger wire supported cable hangers to support and separate the various kinds of electrical cables within a solar installation array. CAB retained Brooks Engineering to evaluate CAB's above-ground cable management system and prepare a white paper concerning how CAB's above-ground cable management system complied with NEC requirements and standards. I understand that a version of the white paper that I prepared for CAB has been submitted as an exhibit in IPR2024-00139 relating to the '551 Patent. I will discuss this white paper in more detail below.

9. I will also discuss in this declaration my knowledge of CAB's integrated grounding system. I will also explain in more detail below how CAB retained Brooks Engineering to evaluate its integrated grounding system and to update the white paper that I previously prepared for CAB's above-ground cable management system to include how CAB's integrated grounding system complies with NEC requirements and standards.

10. I have no financial interest in CAB or in the outcome of these IPR proceedings or any other legal proceeding involving CAB, the '291 Patent, or the '551 Patent. I am being compensated for my time in preparing this declaration and providing any follow-up information as necessary in these proceedings at the rate of $350.00/hour. To the extent I testify at deposition or other proceeding, I will be compensated at the rate of $450.00/hour. My compensation is not dependent on the outcome of these IPR proceedings, or any other proceeding involving CAB, the '291 Patent, or the '551 Patent.

## II. <u>Solar Industry Background and Experience</u>

11. A summary of my relevant experience follows. More details of my background and experience, including my relevant work and projects, professional affiliations, and publications are included in my resume, a true and accurate copy of which is submitted herewith as **EX2034**.

12. In 1986, I earned a Bachelor of Science (B.S.) with a major in mechanical engineering, *magna cum laude*, from North Carolina State University. In 1992, I earned a Master of Science in Mechanical Engineering from North Carolina State University.

13. From 1988 through 1998, I worked as a Solar Engineering Specialist for the North Carolina Solar Center, located in Raleigh, North Carolina. In 1988, I was one of four founding members of the North Carolina Solar Center. As Solar Engineering Specialist and founding member, I coordinated all engineering-related activities for the center, including analytical studies and the evaluation of solar products in development.

14. During the time I spent with the North Carolina Solar Center, solar installations were almost all off-grid, i.e., they were not connected to the utilities that provided electrical power to customers. For various reasons, including safety concerns, there was at that time resistance on the part of the utility companies to connect solar-generated power to the grid. I spent a substantial amount of time working with utility company engineers to convince them that any safety concerns could adequately be addressed, and that it would be entirely safe to connect these installations to the grid.

15. In 1998, California adopted a solar energy rebate program. Given the significance of this program to the growth of the solar industry, I relocated from

North Carolina to California when this program started. From 1998 to 2004, I worked as a Project Engineer for Endecon Engineering located in San Ramon, California. At that time, Endecon Engineering was one of the most experienced engineering consulting firms specializing in grid-connected PV systems.

16. At the time I moved to California, nearly all solar installations were residential. As Project Engineer at Endecon, I developed and directed technical training programs for PV system installers and code officials at the California Energy Commission to get solar-generated power connected to the grid. I continued to work with utility companies and other entities in the PV industry to promote the interconnection of solar-generated power to the grid and was involved in preparing interconnection standards and agreements. I also provided consulting services related to PV systems to private companies and governmental organizations.

17. While at Endecon Engineering, I also collaborated with the North American Board of Certified Energy Practitioners to develop national PV installation standards. In 2000, I was appointed the technical facilitator of Electric Rule 21 (the California interconnection standards for distributed energy technologies). Of the total power generation in California, approximately 90% is centralized power. The additional 10% (which is comprised mostly of solar but

also wind and small scale natural gas) is connected to the utility grid based on this Electric Rule 21 standard.

18. In 2005, I established Brooks Engineering to provide consulting engineering services to a wide variety of clients, both private and governmental, in the solar industry. Through Brooks Engineering, I provide consulting services in the areas of code compliance, fire investigation, permitting, inspection, interconnection, safety, system design, technical manual development, systems analysis, operations, maintenance, and troubleshooting of PV systems.

19. In addition to my work experience above, I am a member of a number of electrical and PV-related organizations that focus on technical and code issues that impact not only the solar industry, but the electrical industry, generally.

20. Since 2009, I have served as a member of the National Electric Code, Code-Making Panel No. 4, responsible for Articles 690, 691, 694, 705, and 710 of the NEC. In addition, within the Code-Making Panel No. 4, I was the chair of the NFPA firefighter safety task force and chair of the NFPA Large-Scale PV Electrical Supply Station task group. As chair of the NFPA Large-Scale PV Electrical Supply Station task group, I assisted in the drafting of NEC Article 691, governing large-scale (i.e., utility-scale) PV electric supply stations.

21. I was the lead on the Code Official Panel for the Solar America Building Codes Committee for the United States Department of Energy.

22. I was a member of the technical review committees for IEEE-929 ("Recommended Practice for Utility Interface of Photovoltaic (PV) Systems"), and IEEE-1547 ("Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces").

23. I am a member of the Technical Committees for multiple UL Standards. UL Standards are set by UL Solutions, the recognized authority responsible for establishing safety and code requirements for nearly every industry, including solar and other forms of power generation. Within solar, these UL Standards ensure the safe and code compliant installation of PV arrays. Specifically, I am a panel member for UL1703 ("Flat-Plate Photovoltaic Modules and Panels"), UL1741 ("Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources"), UL2703 ("Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels"), UL3741 ("ANSI/CAN/UL Photovoltaic Hazard Control") and UL9540 ("Energy Storage Systems and Equipment").

24. I am a member of the International Electrotechnical Commission (IEC) TC 82 Working Group 3 and Working Group 6. The TC82 Working Groups are responsible for the preparation and establishment of international standards for PV components and systems.

25. Given my extensive knowledge of PV codes and regulations, as well as PV system safety, I have personally been called upon to investigate several dozen PV-related fires to determine the root cause of those fires.

26. I also train PV industry professionals, including engineers, electricians, PV system installers, building officials, and inspectors on numerous issues and topics relevant to the industry. The training I conduct includes, but is not limited to, the following topics: code compliance; design and configuration of solar arrays; proper cable management in a solar array; effective and safe installation of wiring systems, including selection of appropriate wire sizes; and general safety and protective measures, including system grounding and circuit overcurrent protection.

27. I have authored dozens of publications on topics within the PV industry including the NEC, PV system installation, fire safety, fault detections, and inspection guidelines. A list of some of my publications to date is included within my resume. *See* **EX2034**.

## III. <u>Growth of the Solar Industry</u>

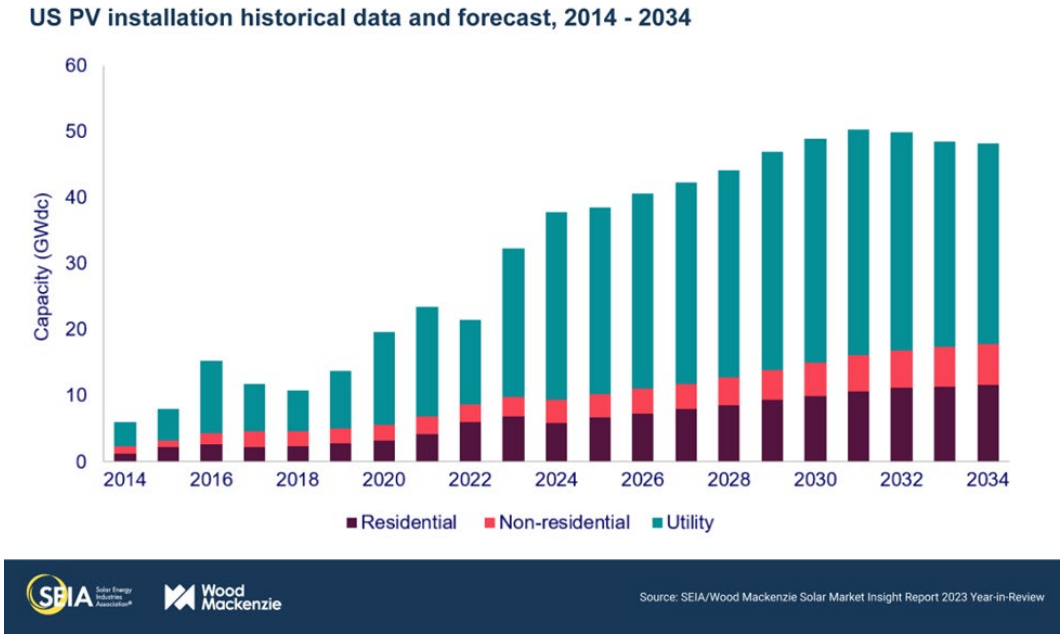
28. In my capacity as a consultant and professional engineer in the solar industry, I have acquired substantial personal knowledge concerning the solar industry generally, including, specifically, the growth of utility-scale solar power plants over the past 20 years.

29. While there were a couple solar plant installations in California in the 1980s, utility-scale solar power plants generally began to be developed in the U.S. in the mid-2000s. The solar industry typically measures the size of solar projects and the growth of the solar industry in terms of the wattage power rating of that solar power project. In the 2005 to 2006 timeframe, the typical solar power installation was rated at around 1 megawatt. In the 2008 to 2009 timeframe, the solar industry started to see multi-megawatt projects, including the Nellis Air Force installation in Nevada, which was 14 megawatts. In the 2010 to 2011 timeframe, the industry started to see solar power installations with wattage power ratings of over 100 megawatts. Today, the larger solar power installations have wattage power ratings of 500 or more megawatts.

30. A reliable source of solar industry growth is from the Solar Energy Industries Association ("SEIA"). SEIA is an industry lobbying group located in Washington, DC. Amongst its many functions in the solar industry, SEIA collects, compiles, analyzes, and publishes data, information, and written analyses of the solar industry. Specifically, SEIA collects, compiles, analyzes, and publishes analyses and reports on the growth of the solar industry. This published information is typically available on SEIA's website (seia.org).

31. SEIA published its Solar Market Insight Report 2023 Year in Review (**EX2035**) and made it available on its website at https://www.seia.org/research-

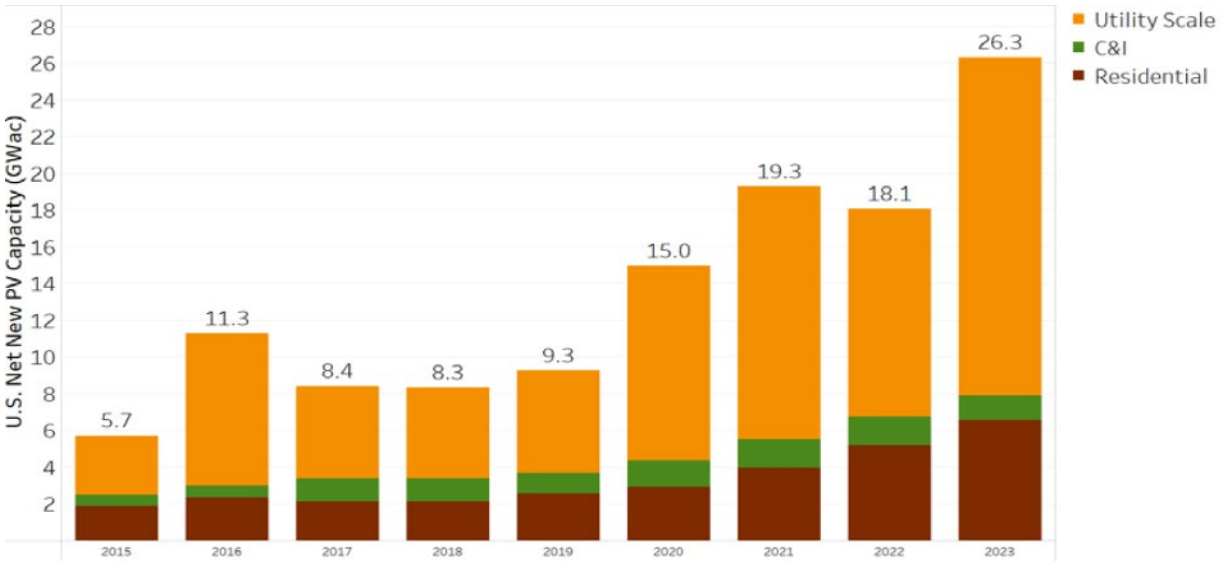
resources/solar-market-insight-report-2023-year-review#:~:text=Solar%20accounted%20for%2053%25%20of,%2C%20growing%2013%25%20over%202022. This version of the report available online presents a summary of the complete version of the report that SEIA publishes. Included within this online version of the report is a chart titled "US PV installation historical data and forecast, 2014 - 2034", included below. This chart details the amount of historical and projected capacity in watts in the solar industry for every year from 2014 to 2034, which includes the total amount in gigawatts and broken down by the various segments of the solar industry (residential, non-residential, and utility).




**EX2035**, at 12 (excerpted).

32. Another reliable source of industry data is the National Renewable Energy Laboratory ("NREL") of the United States Department of Energy. NREL specializes in the research and development of renewable energy, energy efficiency, energy systems integration, and sustainable transportation. In this capacity, NREL collects, compiles, and analyzes data from the solar industry. NREL also publishes various reports sharing data about the solar industry and its analysis of that data.

33. In May 2024, NREL published a report titled "Spring 2024 Solar Industry Update" (**EX2036**), publicly available at https://www.nrel.gov/docs/fy24osti/90042.pdf. Various portions of this report analyze and publish the growth of the solar industry in the United States from 2010 through 2023. The report at page 24 includes a chart titled "U.S. Installation Breakdown Annual: EIA ($GW_{ac}$)", set forth below, that identifies year-to-year growth in solar capacity in the U.S., in terms of "U.S. Net New PV Capacity (GWac)."




*Id*., at 24 (excerpted).

34. The chart above can itself be accessed in interactive format online at https://public.tableau.com/app/profile/jarett.zuboy/viz/PVCapacitybySegment/Dashboard1, by hovering the cursor over the various bars in the graph, to obtain more information broken down by the three segments of the solar industry: utility (i.e., utility-scale installations), C&I (commercial and industrial), and residential. This view provides the exact amount of new PV capacity for each segment of the solar industry. The amount of new PV capacity in utility in a given year would therefore measure the growth of the segment of the solar industry within which CAB operates, i.e., utility-scale solar.

35. As the SEIA and NREL charts show, there was increased solar capacity growth from 2014 to 2016, then a dip in growth from 2016 to 2017, with growth remaining relatively stagnant until 2020 when growth resumed. This

pattern reflects federal energy tax credits that were offered in 2014, which were used to fund solar installations through 2016. Because of political and economic concerns at the time, there was a fear that the tax credits would be revoked in 2017. As a result, numerous projects that would have been slated for 2017, as much as 3-4 GW in total, were fast-tracked and installed in 2016. Even some projects that would have been slated for 2018 were pushed up to 2016. As it turns out, the tax credits were not revoked as feared, but because of the fast-tracking of projects in 2016, growth flattened out in 2017 and 2018. In addition, there was significant concern in 2017 of tariffs being imposed on countries like China, where many solar components were being manufactured. This further subdued growth in 2018 and 2019. Growth resumed in 2020. COVID actually contributed to the growth in solar capacity in 2020 and 2021, as during this time solar installations were among the only construction projects being installed. Solar growth again dipped from 2021 to 2022 because of a significant increase in postponed operational dates. These delays resulted from restrictions in importing PV modules into the U.S., as well as COVID-related supply chain issues. Growth resumed again in 2023, as additional federal subsidies under the Inflation Reduction Act passed in August 2022 brought more infusion of capital and increased investments for utility-scale solar projects.

## IV. Introduction to CAB's Above-Ground Cable Management System

36. In October 2013, I attended the Solar Power International ("SPI") trade show in Chicago, Illinois. Since the mid-1990s, SPI has been one of the solar industry's leading trade shows and is held at various cities throughout the U.S. Solar experts and professionals throughout the industry routinely attend the SPI trade shows. As an engineer and consultant in the solar industry, I have attended the SPI show every year since its inception.

37. I first learned of CAB at the 2013 SPI show. At that show, CAB had an exhibit showcasing its idea of an above-ground cable management system for solar applications. I stopped at the exhibit and met CAB and learned about CAB's proposed system that would use cable hangers suspended from a messenger wire to support various kinds of electrical cables between the solar panels and the inverter.

38. At that time, CAB was the first and only company in the solar industry who had offered an above-ground cable management system using messenger wire supported cable hangers to support cables in a solar installation array.

39. In a solar plant installation, DC collector cables collect the DC current from the numerous solar cells included within the solar panels. These DC cables ultimately need to extend along a route to an inverter, where the DC current is converted to AC current where it can then be connected to the grid. The DC cables

that come off solar panels are referred to as "string" cables. There are various combiner boxes along the route to the inverter. At each combiner box along the way, the DC string cables extending from corresponding rows of solar panels are collected in the combiner box and combined into a "feeder" cable. When all the string cables coming off all the rows of the solar panels are combined into feeder cables, the feeder cables are then fed into an inverter, which converts the DC current to AC current. The AC current is then connected to the grid.

40. In addition to the DC cables, there may be other kinds of cables within the solar array, including AC current cables and data cables. These cables are typically supported together with or in close proximity to the DC cables.

41. Prior to 2014, the predominant method of supporting the various kinds of cables within a solar installation array was to bury the cables underground in trenches (commonly known as "trenching"). Trenching involves digging the trenches and burying conductors underground or placing them in conduit (PVC pipes enclosing the conductors). Direct burial of conductors is expensive and inefficient. Installing conductors in buried conduit is even more so. Among the problems with trenching are the significant labor required in digging the trenches and burying the cables. Furthermore, trenching poses problems over time because the cables are not easily accessible when repairs or maintenance are required,

which creates more cost and inefficiencies in needing to dig the conductors back up.

42. The only cable management alternative to trenching at that time was the use of metal cable trays, which were employed on a much fewer number of installations. Cable trays are primarily useful for rooftop applications, and even then they are more expensive than buried cables or conduits. Cable trays are not as effective or efficient for utility-scale solar energy plants, since their costs are much higher.

43. At the 2013 SPI show, CAB requested that Brooks Engineering evaluate CAB's above-ground cable management system and prepare a white paper analyzing whether CAB's above-ground cable management system complied with electrical code requirements. I understood at that time that CAB wanted to use the white paper to help promote their new cable management system to the industry. I agreed that Brooks Engineering would perform the services as CAB requested. After the 2013 SPI show, I began working on the white paper.

44. I prepared an initial version of the white paper in January 2014 titled "Cable Management in Solar PV Arrays: A Review of Requirements in the National Electrical Code and how CAB Cable Rings and Saddles Meet These Requirements" dated January 13, 2014.

45. The primary focus of the white paper was to show how the installation of CAB's cable rings and saddles suspended from a messenger wire in a solar PV array would comply with the NEC and electrical installation standards. The NEC does not contain a lot of guidance on management of cables exposed in open air. However, the NEC contains several references to such systems and requirements for safe wiring practices that can be used to develop best practices for above-ground, exposed solar cable systems in PV systems. In the white paper, I set forth the NEC requirements and industry-standard installation practices that were or could be applicable to CAB's above-ground cable management system. I then evaluated CAB's above-ground cable management system in light of those NEC requirements and industry-standard practices.

46. Ultimately, I concluded that CAB's above-ground cable management system using cable rings and saddles suspended from a messenger wire was compliant with the NEC and other industry-standard installation practices, such as set forth in ANSI/NECA.

47. Then, on July 22, 2014, CAB informed me that it had developed designs for its cable hangers to provide separation of AC from DC cables, and which would also provide a separate carrier surface for data/communication cables. CAB requested that I update my initial white paper to evaluate their new designs in

light of the new NEC requirements specifically requiring separation of AC and DC cables. I agreed to do so.

48. I prepared the updated white paper dated September 18, 2014. I understand that a copy of this updated version of my white paper has been introduced into evidence as **EX1006** in IPR2024-00139. This updated version includes additional analysis and evaluation of how CAB's above-ground cable management system sufficiently separates AC and DC cables to be compliant with the NEC.

49. CAB was able to use this updated version of the white paper in furtherance of its attempts to gain industry acceptance of an above-ground cable management system that the industry had not seen before. Given this unfamiliarity with the kind of cable management system that CAB was offering, together with the challenges that were already well known relating to cable management in solar installations, it took much effort to overcome industry resistance to CAB's unconventional system.

## V. CAB's Integrated Grounding System

50. In January 2018, CAB informed me that it had developed a new "integrated grounding system". This system used the messenger wire not only to support the cable hangers suspended from it, but also as an equipment grounding conductor for clearing a ground fault or voltage surge in the system. The NEC

refers to an equipment grounding conductor as providing an "effective ground fault current path." *See, e.g.,* 2008 NEC, **EX1007** in IPR2024-00139, Art. 250.2, 250.4.

51. Prior to this time, I had never seen or heard of a messenger wire being used as a support structure *and* grounding conductor, in any kind of electrical system. Messenger wires were commonly understood to support other wires or conductors, such as in a service drop from a pole to a building, and could be lashed into phase conductors, but in those instances it does not act as a grounding conductor.

52. Prior to CAB's introduction of its integrated grounding system, in order to protect against issues such as lightning strikes, electrical shorts, or undesirable current, a grounding conductor separate from a messenger wire was required to provide that effective ground fault current path. For example, as the '551 Patent discusses in the context of a solar installation, a separate grounding conductor needed to run adjacent the messenger wire, and that separate grounding conductor bonded to each metal pile by a bonding jumper.

53. These grounding conductors and bonding jumpers are made of highly conductive material, such as copper, and can be very expensive. CAB's new integrated grounding system that offers the ability to use a messenger wire as a

grounding conductor as well as a support structure provides significant cost savings, both in terms of material and labor.

54. In March 2018, CAB again asked me to evaluate its integrated grounding system in relation to the NEC, and to prepare a corresponding and corresponding white paper of CAB's integrated grounding system. I then updated my previous existing white papers to include CAB's use of a messenger wire support structure that had also been evaluated as both an equipment grounding conductor and grounding electrode conductor. **EX2037** is a true and accurate copy of my updated white paper titled "Cable Management in Solar PV Arrays: A Review of Requirements in the 2017 and 2020 Editions of the National Electrical Code and how CAB Solar Hangers Meet These Requirements" and dated November 25, 2020.

55. I understand that in IPR2024-00139 relating to the '551 Patent, AWM has argued that my white paper from September 18, 2014 (**EX1006**), discloses a messenger wire that also serves as a grounding conductor. I understand that AWM has pointed to an image from CAB's website that I included on the cover page of that white paper purporting to show a steel messenger wire connected to metal hardware and a metal pile, as well as my reference in the white paper to a "grounded steel messenger wire," to support its argument.

56. My September 2014 white paper (**EX1006**) in no way discloses or suggests the use of a messenger wire acting as a grounding conductor in addition to supporting the cable hangers.

57. I have been informed that the parties and the Board have defined a "person of ordinary skill in the art" to be a person with a bachelor's degree in a pertinent discipline, such as electrical engineering, civil engineering, mechanical engineering or equivalent with 2-3 years of experience in electrical utility systems planning, and design, with more or less experience depending on the level of education. No such person with that level of skill would look at the depiction on the cover page of my white paper, which was taken from CAB's website, and conclude that the purported messenger wire connected to metal hardware and a metal pile is acting as a grounding conductor.

58. First, what is depicted on the cover page of my white paper (which was taken from the CAB website) is a mock-up that CAB prepared to demonstrate a messenger wire and single carrier cable ring and saddle hangers. This mock-up was done at an installation in Carlisle, Pennsylvania, back in 2013. The cable rings and saddles, messenger wire, and hardware used to support the messenger wire to the pile were all erected on the site by CAB. A person with the defined level of skill would immediately suspect, if not assume, that the CAB hangers, messenger wire and hardware were not part of an actual installation.

59. A person of that level of skill would recognize from the appearance of what is depicted as a messenger wire appears more to be a wire rope, which would never be used in this kind of "installation" to support cable hangers and current wires.

60. More importantly, any person familiar with solar plant installations would instantly recognize that the depicted messenger wire is incorrectly oriented as shown. The messenger wire and hangers would be understood to be supporting the current wires along the "home run" on the way to the inverter, running at the end of the solar panel rows and perpendicular to the solar panels, not under the solar panels and parallel with them.

61. In addition, any person familiar with these kinds of installations would know that what is depicted in the photograph as the messenger wire, hardware components coupling the messenger wire to the metal piles and the piles all need to be bonded, and from how the mounting hardware is depicted in the photograph, would be dubious as to whether that is the case as shown. At the very least, such a person would question whether what CAB constructed as a mock-up is an actual installation.

62. Moreover, a person of such skill level would not assume that the depicted messenger wire is a grounding conductor simply because a separate grounding conductor is not shown. As I stated above, a person of ordinary skill at

this time familiar with solar plant installations would not have understood messenger wires to be used as grounding conductors, and, therefore, would have had no reason to assume that the depicted messenger wire was intended to act as a grounding conductor. Rather, knowing that a grounding conductor would be an essential part of any such system, such a person would much more likely assume that there would be a separate grounding conductor that would not even be shown in the area depicted in the photograph. At the very least, a person familiar with these kinds of installations would inquire about the grounding conductor, rather than assume that the messenger wire was the grounding conductor. If anything, the absence of a separate grounding conductor would raise further doubts of what this photograph is intended to show.

63. I also understand that AWM and the Board have pointed to my reference in my white paper to a "grounded steel messenger wire" (**EX1006**, at 14). My reference to a "grounded steel messenger wire" in no way discloses or suggests that the messenger wire is acting as a grounding conductor. The reference to a "grounded steel messenger wire" is in the context of whether CAB's metallic cable rings and saddles could be installed without a listing for bonding and grounding. I was explaining that no such listing would be necessary. This is because even if the insulation on the electric cables were to be damaged such that the metal rings and saddles could become energized, they would nevertheless

remain at or near ground potential because they would be in full contact with the messenger wire, *which itself would be grounded.* This does not mean that the messenger wire is a grounding conductor. Rather, it is a separate grounding conductor that grounds all the bonded metallic support components, including the messenger wire. And because the messenger wire is itself grounded, there is no concern about not being in compliance with NEC safety requirements.

64. This portion of my white paper is referring to the grounding and bonding of the *cable supports*. A person with the defined level of skill would understand that it has nothing to do with the grounding conductor that provides an effective ground fault current path.

65. Also, as I noted above, I updated my white paper in November 2020, to include a discussion about CAB's new grounding messenger wire. *See* **EX2037**, at 12. I specifically described that grounding messenger wire as having been evaluated and certified as "both an equipment grounding conductor (EGC) and grounding electrode conductor (GEC)". This language, which clearly discloses a messenger wire that acts as an equipment grounding conductor as well as a support structure for the cable hangers, is explicitly different than the language in my 2014 white paper that simply refers to a "grounded messenger wire," and a person with the level of skill as defined in this proceeding would understand the difference between the terms "grounded" and "grounding".

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine, imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

William F. Brooks

Dated: 8 August 2024