



# Field Validation of Equipotential Bonding Systems for Permanent In-ground Swimming Pools

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- > **Prepared For:** Pool Industry Council and Regulatory Stakeholders
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- > Testing Conducted By: Industrial Inspection and Analysis (IIA) ISO 9001:2015



## **Certification of Independence**

SunSmart Engineering hereby certifies that it was commissioned by the Pool Industry Council (PIC) to conduct an independent evaluation of equipotential bonding performance in residential swimming pools across Central Florida.

SunSmart Engineering affirms the following:

- It does not hold, nor will it seek to acquire, any financial interest in either the Pool Industry Council or any other associated organization or company.
- It has not entered into any agreement, express or implied, that would influence the outcome of this study.
- The objective of this study was not to endorse or discredit any particular bonding method or product, but rather to evaluate the field performance of different bonding configurations using standard electrical safety and engineering practices.
- The scope of this project was to observe and measure equipotential voltage performance in existing swimming pools. Any investigation into the cause of any unknown equipotential voltage sources or "stray current" was not in the scope of this study.
- All findings, interpretations, and conclusions in this report are the result of independent technical analysis, supported by data gathered through on-site measurement and scientifically accepted testing procedures, including protocols derived from the Electric Power Research Institute (EPRI) and the National Electrical Code (NEC).
- The data presented herein are offered in good faith, without prejudice, and are suitable for review by regulatory authorities, safety professionals, and industry stakeholders.



## **Acknowledgements**

SunSmart Engineering would like to thank the following organizations for their valuable contributions and support throughout this study. Any opinions, findings, conclusions, or recommendations expressed in this paper are those of the authors and do not necessarily reflect the views of any other party directly or indirectly involved.

- Pool Industry Council (PIC)
- Industrial Inspection and Analysis (ILA)
- Holland Pools & Spas Longwood, FL
- > Aqua Blue Pools & Spas Melbourne, FL
- Mad River Pool Construction Maitland, FL



Table of Contents	-
I. Executive Summary	
II. Technical Background	
Historical Timeline of Equipotential Bonding Requirements in Florida	
Key References:	
III. Human Shock Risk and Voltage Thresholds in Pool Environments	
Introduction	
Rationale for the 500-Ohm Load	13
Origins of the 1.0 VAC Threshold	13
Human Sensitivity to Electric Current	13
Human Body Resistance Context	14
Resistance Value Used	14
Industry Adoption and Best Practices	15
Conclusion	15
IV. Field Testing Procedure	15
Test Specimens	15
Testing Protocol Overview	17
Equipment Utilized	17
Continuity Testing	18
Voltage Gradient Test Method	18
Purpose of Multi-Voltage and Resistive Load Testing	19
V. Findings and Test Results	21
Table 1 - Site Descriptions	21
Table 2 - Soil Composition and Conductivity	22
Table 3 - Baseline Equipotential Voltage Readings	23
Table 3A - Summary of Median Baseline Equipotential Voltage Readings	23
Table 4 - Summary of Equipotential Voltage Readings Under Simulated Fault Condition	าร 25
Table 4A - Aggregate Statistical Summary	



Table 5 - V500 Voltage Summary by Bonding Type	27
Table 5A – Verification Testing of Pool #6	28
Table 5B – Summary of Differences Between Test #1 & #2 for Pool #6	29
Chart 1 – Equipotential Voltage Measurements at V500, 120 VAC	30
Chart 2 – Equipotential Voltage Measurements at V500, 120 VAC (Without Pool #6)	31
Table 6 - Equivalent Current (mA) by Pool, Voltage, and V500 Measurement	32
Table 6A - Summary of V500 Current by Bonding Type (at 120 VAC)	32
VI. Conclusions & Commentary	33
VII. Bibliography	34
Appendix A – Full Voltage Gradient Test Data by Pool	35
Test Pool #1	36
Test Pool #2	38
Test Pool #3	40
Test Pool #4	42
Test Pool #5	44
Test Pool #6	46
Test Pool #6b	48
Test Pool #7	50
Test Pool #8	52
Test Pool #9	54
Appendix B – Site Photos	56
Pool #1 - 10961 Prairie Hawk Dr, Orlando, FL 32837	57
Pool #2 – 667 Linville Falls Dr, West Melbourne, FL 32904	58
Pool #3 – 1906 Summerfield Rd, Winter Park, FL 32792	59
Pool #4 – 17909 Lookout Hill Rd, Winter Garden, FL 34787	60
Pool #5 – 13331 Sugarloaf Ct, Clermont, FL 34715	61
Pool #6 – 20451 Fieldcrest Ct, Clermont, FL 34715	62
Pool #7 – 5753 Timber Meadow Wy, St Cloud, FL 34771	63



Α	ppendix C – Industrial Inspection and Analysis (IIA) Test Report TR_18836-25	66
	Pool #9 – 590 Dinner St NE, Palm Bay, FL 32907	65
	Pool #8 – 1512 Pines End Pl, St Cloud, FL 34771	64



#### I. Executive Summary

This report summarizes the results of an equipotential bonding validation study conducted across nine residential pools in Central Florida between April 7 and June 12, 2025. The Pool Industry Council (PIC) commissioned SunSmart Engineering to conduct this independent testing. The objective of this study was not to determine strict code compliance, but rather to analyze and compare the real-world performance of different bonding methods used across pool construction types. Particular attention was given to understanding the behavior of #8 AWG copper wire loops, copper reinforcement grids, and inline water bond plates in operational field conditions.

SunSmart Engineering enlisted the assistance of Industrial Inspection and Analysis (ILA), an accredited third-party testing laboratory, who provided professional test technicians, calibrated equipment, and oversight of the testing at all sites.

While the National Electrical Code (NEC) does not specify a voltage performance threshold, a value of **1.0 VAC under 500 ohm load** has been widely adopted in technical literature and validation testing protocols (e.g., EPRI, IEEE, etc.) as a practical upper bound for safe equipotential bonding effectiveness. This threshold was used in the analysis below as a comparative metric, not as a legal or enforcement standard.

#### II. Technical Background

Equipotential bonding minimizes voltage gradients between conductive parts and surfaces within and around pool environments. This measure reduces shock hazard potential due to stray or fault currents. Bonding all conductive parts ensures voltage differences stay within tolerable limits for human safety. The Electric Power Research Institute (EPRI), IEEE, and Consumer Product Safety Commission (CPSC) have highlighted cases of pool electrocutions, primarily due to improper bonding of metallic parts and lighting fixtures. EPRI's research has established recommended methods for voltage gradient testing, which influenced state and industry guidelines.

NEC 680.26 establishes the requirements for equipotential bonding in and around permanently installed swimming pools. Its primary purpose is to <u>minimize</u> voltage gradients that could occur between conductive parts (e.g., pool water, decks, metal objects, electrical equipment) during a fault or leakage event. By electrically interconnecting all metallic and conductive components using a copper bonding conductor or approved methods, the code aims to prevent hazardous shock conditions and ensure safe touch and step potentials for pool users. **Figures 1 & 2** graphically detail this.



#### FIXED METAL PARTS

Within 5' horizontal and 12' vertical. Examples: Metal windows and doors, metal fences

#### METAL COMPONENTS

<60

Shall be made by exothermic welding, by listed pressure connectors or clamps that are labeled as being suitable

fasteners that engage not less than two threads or are secured with a nut, thread-forming machine screws that

engage not less than two-threads, or terminal bars. Sheet metal & self-drilling screws are NOT acceptable. †

for the purpose and that are made of stainless steel, brass, copper, or copper alloy, machine screw-type

All metallic parts of the pool structure, including reinforcing metal shall be bonded. † Exception: Where reinforcing steel is encapsulated with a nonconductive compound. † -Examples: Diving board support, ladders and rails

#### UNPAVED PERIMETER SURFACES

Shall have a copper conductor grid or copper ring bonded to the shell reinforcing

steel shall be bonded together by steel tie

wires or the equivalent. Concrete and plaster

shells are considered conductive. Vinyl and

fiberglass shells are non-conductive. †

CONDUCTIVE POOL SHELL Unencapsulated structural reinforcing

BONDING CONNECTIONS

#### UNDERWATER LIGHTING

Metal forming shells and mounting brackets of no-niche luminaires shall be bonded. t

BONDING CONDUCTOR REQUIREMENT 8 AWG or larger covered or bare solid copper conductor

#### Heater

Pump

ELECTRICAL EQUIPMENT Associated with the pool. Examples: Pumps, pool cover tracks and motors

† NFPA 70

#### PERIMETER SURFACES

Paved or unpaved surfaces shall be attached to the pool reinforcing steel at a min of four points uniformly spaced around the perimeter of the pool. †

Where structural reinforcing steel is not available or is encapsulated in a non-conductive compound, a copper conductor ring may be utilized. 8 AWG bare solid copper secured within or under the perimeter surface 4" to 6" below the subgrade. †

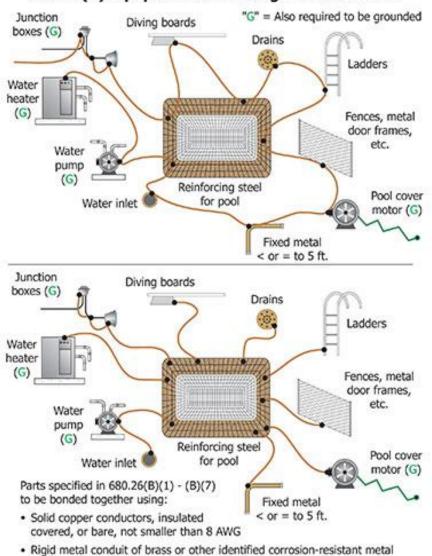
## **OUpCodes**

#### FIGURE 1 – EQUIPOTENTIAL BONDING OF SWIMMING POOLS (NEC 680.26)

18".to 24"

<36





#### 680.26(B) Equipotential Bonding - Bonded Parts

## FIGURE 2. EQUIPOTENTIAL BONDING GRID FORMS AN EQUIPOTENTIAL BONDING PLANE IN AND AROUND THE POOL AREA. THIS BONDING PLANE CAN BE ACHIEVED WITH ONE "ALTERNATIVE MEANS" BONDING JUMPER (TOP) OR MULTIPLE BONDING JUMPERS (BOTTOM).



#### Historical Timeline of Equipotential Bonding Requirements in Florida

The evolution of equipotential bonding requirements in Florida reflects a commitment to enhancing pool safety through alignment with national standards and empirical research.

#### 2005: Introduction of Equipotential Bonding in NEC

The 2005 edition of the National Electrical Code (NEC) introduced the term "equipotential bonding," replacing the earlier "common bonding grid." This change aimed to clarify the purpose of bonding in reducing voltage gradients in pool areas. NEC 680.26 outlined requirements for bonding conductive pool shells, perimeter surfaces, and metallic components.

#### 2007: Florida's Adoption of Alternative Bonding Methods

In response to legislative direction, Florida proposed Rule 9B-3.0477, allowing an alternative to the copper bonding grid specified in the 2005 NEC. The rule permitted the use of a single #8 AWG solid copper conductor for equipotential bonding under certain conditions, providing a cost-effective solution without compromising safety. <u>Florida Administrative Rules</u>

#### 2008: Inclusion of Pool Water Bonding

The 2008 NEC expanded bonding requirements to include an intentional bond to the pool water, recognizing that water itself could be a conductive path for stray voltages. This addition mandated a conductive surface area of at least 9 square inches in contact with the pool water, connected to the equipotential bonding system. Florida Building

#### 2011: Reinforcement of Bonding Requirements

The 2011 NEC reinforced existing bonding requirements and clarified the necessity of bonding for various pool components, including underwater lighting and fixed metal parts. These provisions aimed to address ambiguities and ensure comprehensive bonding practices. <u>Florida Building+1InterNACHI®</u> Forum+1

#### 2014: Florida Building Code Alignment

Florida's 5th Edition Building Code (2014) incorporated the updated NEC provisions, emphasizing the importance of equipotential bonding in reducing voltage gradients. The code mandated bonding for all



conductive pool shells, perimeter surfaces, and metallic components, aligning state requirements with national standards. Florida Building

#### 2016: Florida Building Commission Advisory

In 2016, the Florida Building Commission issued a fact sheet titled "Swimming Pool Electrical Safety," highlighting the critical role of equipotential bonding in pool safety. The document clarified when bonding is required and provided guidance on proper implementation. <u>Florida Building</u>

#### 2020: Emphasis on Bonding in Florida Building Code

The 7th Edition of the Florida Building Code (2020) continued to emphasize the necessity of equipotential bonding, incorporating the latest NEC standards. The code specified bonding requirements for existing pools, mandating the use of solid copper conductors not smaller than #8 AWG. <u>ICC Digital Codes+1ICC Digital Codes+1</u>

#### 2023: Current Standards and Practices

The 8th Edition of the Florida Building Code (2023) maintains stringent equipotential bonding requirements, ensuring that all new and existing pools adhere to safety standards. The code continues to reference NEC 680.26, mandating comprehensive bonding of all conductive components to mitigate electrical hazards.

### TIA 23-9

In the first printing of the 2023 NEC, § 680.26(B)(2)(b) allowed a single #8 AWG bare copper conductor ("copper ring") to serve as the alternate perimeter-bonding means whenever exposed reinforcing steel was absent or encapsulated, regardless of whether the overlying surface was concrete, masonry pavers, or bare soil. The conductor was to be located 450–600 mm (18–24 in.) from the pool wall and 100–150 mm (4–6 in.) below sub-grade, with only listed splices or exothermic welds permitted.

Tentative Interim Amendment 23-9 (Log 1687, effective 4/10/2023) rewrites § 680.26(B)(2) and withdraws that option for all *conductive paved portions* of the perimeter. The revised § 680.26(B)(2)(a) now requires one of three bonded assemblies under concrete, shotcrete, gunite, tile, or masonry-paver decks:

- Un-encapsulated structural reinforcing steel tied in accordance with § 680.26(B)(1)(a);
- ▶ ASTM 6 × 6-W2.0 × W2.0 welded-wire reinforcement or No. 3 rebar in a 300 mm (12 in.) grid; or



A listed #8 AWG copper or steel conductor grid, also in a 300 mm grid pattern, all located no more than 150 mm (6 in.) below finished grade.

The TIA in question was issued on 3/21/2023 for the NEC 2023 and required both the copper grid and any un-encapsulated steel mesh used for this purpose must carry a corrosion- and mechanical-performance listing. It was left to each AHJ whether to accept this TIA and/or when the effective date would be.

The single #8 AWG copper ring is retained—but only in re-designated § 680.26(B)(2)(b)—for <u>unpaved</u> <u>portions</u> of the perimeter surface, and then only where the area is "not intended to have direct access to swimmers." Depth is now referenced to <u>finished grade</u> instead of sub-grade, and the original lateral offset and burial depth remain unchanged.

Under the TIA, a linear #8 AWG copper ring can no longer be specified beneath concrete or paver decks. These surfaces must be bonded with either embedded reinforcing steel, welded-wire reinforcement, or a listed grid having two-dimensional continuity. The #8 AWG copper ring has been relegated to landscaped or otherwise non-traffic areas, reflecting test data that showed a single conductor to be inadequate for controlling touch-potential gradients in conductive decks.

#### **Key References:**

- NEC 680.26 (2023 Edition) Bonding requirements for permanently installed pools
- IEEE 1695-2024 Guide for Understanding, Diagnosing, and Mitigating Stray and Contact Voltage
- **EPRI** Field procedures for bonding validation
- Florida Building Commission Advisory (2016) Testing standards for equipotential planes
- CPSC Electrical Injury Reports (2002–2014)

A commonly referenced safety threshold is **1.0 VAC at a 500-ohm load**, approximating the human body's resistance in a wet environment. Voltages below this level are considered safe for barefoot human exposure.

### III. Human Shock Risk and Voltage Thresholds in Pool Environments

#### Introduction

Electrical safety in swimming pool environments is paramount due to the increased risk of electric shock in wet conditions. Equipotential bonding systems are designed to minimize voltage gradients, thereby reducing the risk of electric shock. However, the *National Electrical Code (NEC) Section 680.26* outlines general bonding requirements but does **not** specify a particular voltage limit for performance under fault conditions (see NEC 2023, Section 680.26).



To address this gap, industry stakeholders have adopted empirical benchmarks—most notably the **1.0** VAC across a 500-ohm load—to assess the effectiveness of bonding systems under real-world conditions.

#### Rationale for the 500-Ohm Load

The selection of a 500-ohm load in voltage gradient testing is based on approximating the **electrical resistance of the human body under wet conditions**. According to IEC 60479-1 (<u>https://webstore.iec.ch/en/publication/62980</u>), the total body impedance can vary significantly depending on factors such as skin moisture, contact area, and current path. In wet conditions, resistance can fall to approximately **500 ohms**, particularly for a hand-to-foot or foot-to-ground path—a common scenario for barefoot individuals in or near a pool. This approximation is therefore considered a **conservative and technically justified baseline** for simulating realistic shock scenarios.

#### Origins of the 1.0 VAC Threshold

The **1.0 VAC at 500-ohm load** threshold originates from a combination of **field validation studies** and **regulatory advisories**:

- The Electric Power Research Institute (EPRI) conducted extensive testing of stray and contact voltages in pool environments. Their findings demonstrated that even low-level voltage gradients (as low as 1.0 VAC) across a 500-ohm resistance could produce perceptible shocks, particularly in wet barefoot conditions (EPRI Recommendations).
- The Florida Building Commission, in its 2016 technical sessions, supported adoption of equipotential test protocols referencing the 1.0 VAC threshold as a practical safety benchmark (Florida Building Commission – Program Committees).

#### **Human Sensitivity to Electric Current**

The severity of an electric shock depends not just on voltage but also on the current path, duration, and impedance. Using Ohm's Law:

$$I = \frac{V}{R}$$

At 1.0 VAC and 500 ohms, current equals **2 mA**, which is *above the perception threshold* but **well below levels associated with serious harm**.



Current (mA)	Physiological Effect						
1	Threshold of perception						
5	Slight shock, not harmful						
10–20	Painful shock, loss of muscular control						
50–100	Ventricular fibrillation becomes possible						

These values are supported by international safety literature, including the IEEE, NFPA, and OSHA, and are formalized in IEC 60479-1.

#### Human Body Resistance Context

Based on conditions encountered around pools (wet skin, conductive deck, etc.), representative resistance values are as follows:

Condition	Typical Resistance (Ohms)
Dry skin (hand-to-hand)	1,000 - 100,000
Wet skin (hand-to-hand)	500 – 1,500
Foot-to-ground (wet surfaces)	300 - 1,000
Full-body path (wet conditions)	~500 (median)

Sources: IEC 60479-1, EPRI Testing Protocols, NFPA 70E

#### **Resistance Value Used**

Alternative values are sometimes proposed, but each has shortcomings in this context:

Load Value (Ohms)	Rationale
1,000	Suitable for dry environments but overestimates impedance for barefoot pool users
100	Overly conservative; does not reflect realistic human body impedance under wet conditions
500 (Used)	Balances realism and safety margin; widely used in standards for human shock simulations

This makes **500 ohms** the most appropriate reference load for voltage gradient testing in pool safety studies.



#### **Industry Adoption and Best Practices**

While not codified in the NEC, the 1.0 VAC at 500-ohm threshold is widely used in:

- > EPRI stray voltage field validation protocols for pools and wet areas (EPRI Field Guide)
- > ANSI/IEEE Std 80 (touch voltage guidelines for grounded systems)

By adopting this benchmark, engineers and inspectors can ensure bonding performance meets realistic and biologically informed safety criteria.

#### Conclusion

The **500-ohm load** simulates realistic human body resistance in wet pool conditions. Combined with the **1.0 VAC threshold**, it serves as a practical and empirically supported benchmark for assessing equipotential bonding systems. These parameters help confirm that voltage gradients in pool environments remain **far below levels capable of causing injury**, reinforcing the effectiveness of bonding designs even when small differences exist between construction methods.

#### **IV. Field Testing Procedure**

To better judge the performance of various electrical bonding methods in real-world scenarios a number of pools across the Central Florida area were measured and evaluated in April & June of 2025. The equipotential bonding evaluation was conducted to assess voltage gradients and bonding continuity across various residential pool types in accordance with empirical field standards, including EPRI guidelines and NEC Article 680.26.

#### **Test Specimens**

A total of nine residential pools were selected, categorized as follows:

- > (3) Steel-reinforced concrete pools with #8 AWG copper single-wire bonding ring
- > (3) Steel-reinforced concrete pools with copper bonding grid
- (3) Non-conductive (fiberglass) pools with inline water bonding systems with a water bond and
   #8 AWG copper perimeter loop.

All pools were assumed to be compliant with NEC 680.26 bonding and grounding provisions, with electrical equipment installed per applicable code and in operational condition. All pools were newly constructed, built by licensed contractors, and permitted and inspected by the local AHJ for code compliance with the 2023 Florida Building Code and 2020 National Electric Code. At the time of this study there were <u>no incidences of shocks or other electrical issues</u> reported by the owners or known to the author of this report.



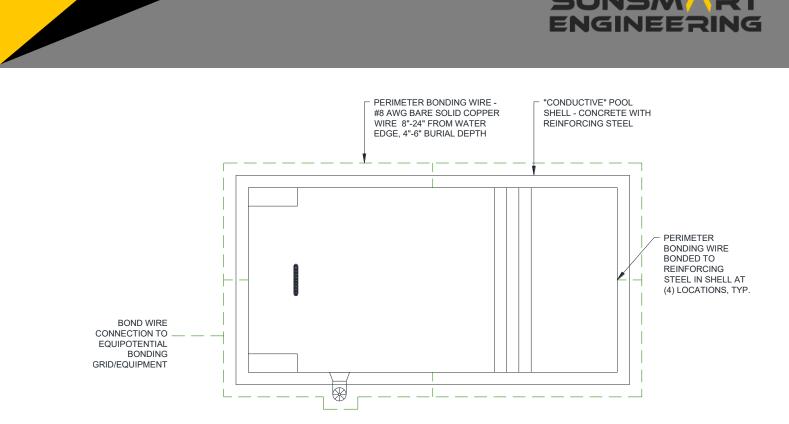
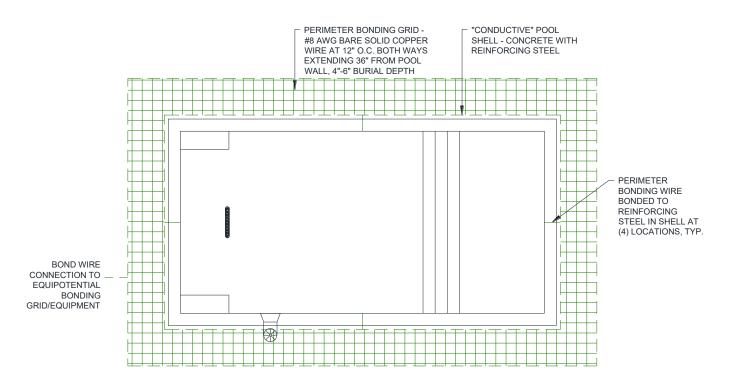
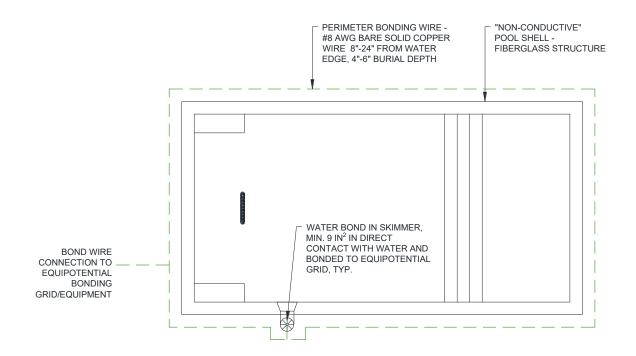


FIGURE 3 – CONDUCTIVE (CONCRETE) POOL WITH #8 COPPER PERIMETER BOND RING METHOD



#### FIGURE 4 – CONDUCTIVE (CONCRETE) POOL WITH #8 COPPER PERIMETER BOND GRID METHOD





## FIGURE 5 – NON-CONDUCTIVE (FIBERGLASS) POOL WITH #8 COPPER PERIMETER BOND RING & WATER BOND METHOD

#### **Testing Protocol Overview**

The testing was comprised of two components:

- 1. **Bonding Continuity Testing** Measuring ohmic resistance between several bonded components to verify low-resistance continuity.
- 2. **Voltage Gradient Testing** Simulating a fault current by energizing the bonding grid and measuring potential differences between the pool water and adjacent wetted decking.

Testing was non-invasive and performed only with owner permission, in partnership with the Pool Industry Council (PIC), which coordinated site access with several of its Licensed Swimming Pool Contractor members who were present during testing.

### **Equipment Utilized**

- > 1800 W, 15 A, 120 VAC Portable Power Supply
  - Used to provide power to the VARIAC unit during fault testing.
- Hewlett Packard 973A Multimeter (True RMS)
  - o Calibrated: 11/29/2023
  - Calibration Expires: 11/29/2025
- Staco 3PN2520-MOD AC Variable Power Supply (VARIAC)
  - o Calibration not required
  - o Input: 120 VAC
  - Output: 0-280 VAC, 5 A



- Copper lead wires and clamps
- Copper ground rod
- Copper plates

#### **Continuity Testing**

The purpose of continuity testing was to **verify proper electrical continuity and functional integrity of the bonding system** at each pool site. Resistance measurements were taken using a precision digital ohmmeter to ensure that all bonded metallic components maintain a low-resistance path to the equipment grounding system.

For each pool, continuity testing was performed between the equipment grounding conductor and **three distinct bonding points** at the pool equipment pad or subpanel area, typically including:

- Bond wire at the pump motor
- Heater chassis or bonding lug
- > Subpanel or control box bonding terminal

The target resistance for a properly functioning bonding system was <1.0 ohm, with most sites yielding readings well below that threshold, confirming effective electrical continuity throughout the bonding network.

#### Voltage Gradient Test Method

The voltage gradient test was based on procedures outlined in the **EPRI Equipotential Bonding Validation Protocol** (2015), with the following key steps:

#### 1. Instrumentation

- Digital voltmeter (sensitive to 0.0004 VAC, True RMS)
- $\circ$  Inline 200 $\Omega$  and 500 $\Omega$  resistive load configurations
- VARIAC voltage source (120 VAC / 0.5 A max)
- Copper contact bars (144 in<sup>2</sup>) for water and deck reference points
- Remote earth ground rod (driven into ground remote from equipment and pool)

#### 2. Pre-Test Baseline Measurement

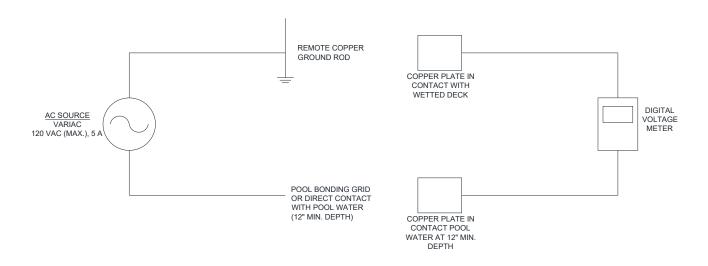
- All pools were tested with their equipment powered on and the circulation pump running as well as in an "off" state with all power circuits de-energized.
- Any pre-existing voltage gradients were measured between the water and wetted deck at 1–5 ft distances to establish a baseline with the pool equipment on and off.

#### 3. Measurement Procedure

- The bonding grid of the pool was energized using the VARIAC hot lead.
  - In the case of the (3) non-conductive, fiberglass pools the hot lead was placed directly in contact with the pool water at a minimum depth of 12". In these cases each pool had a water bonding plate in the skimmer.



- The VARIAC neutral was connected to a remote grounding electrode driven into the earth a minimum of 24".
- Measurements were taken between the water and wetted deck at 1, 2, 3, 4, and 5 ft distances from the water's edge.
  - While the NEC defines the "perimeter" surface as extending 3 ft. from the inside of the pool wall the tests were done to a distance of up to 5 ft. from the inside of the pool wall. This was done to align with previous testing published on the subject and because a person in the pool could conceivable reach out and touch the deck 5ft. from the water and still be in contact with the pool water.
- Each measurement was performed under:
  - Open-circuit (VOC)
  - At 200 ohms (V200)
  - At 500 ohms (V500)
- The test was repeated under three fault voltage levels: **60 VAC**, **90 VAC**, and **120 VAC**.



#### FIGURE 6 – SIMPLIFIED TEST SETUP DIAGRAM

#### Purpose of Multi-Voltage and Resistive Load Testing

To fully characterize the performance of each pool's equipotential bonding system under simulated fault conditions, tests were conducted using **three voltage levels**—**60 VAC**, **90 VAC**, and **120 VAC**—and under **three load conditions**: open circuit (VOC), 200-ohm, and 500-ohm resistive loads. These levels were selected to represent low, intermediate, and full-line fault stressors consistent with EPRI modeling protocols.



This approach served several purposes:

- **1. Simulating Varying Fault Severity** 
  - 60 VAC and 90 VAC represent moderate fault scenarios, such as partial line-to-ground faults or transient energy from external circuits.
  - > **120 VAC** reflects a full-phase fault, simulating the worst-case scenario of energized pool bonding infrastructure relative to remote earth.

Testing across these voltages allowed for:

- > Assessment of voltage gradient linearity and attenuation with distance.
- Identification of bonding systems that become unstable or nonlinear under higher stress conditions.

#### 2. Emulating Human Electrical Load

- > The **200** $\Omega$  and **500** $\Omega$  resistive loads simulate the impedance of the human body in contact with pool water and surrounding surfaces.
  - 500 ohms approximates the body resistance of a barefoot person in wet conditions (per IEC 60479-1 and EPRI methodology).
  - 200 ohms represents a conservative or worst-case human impedance for children or highly conductive conditions.

By comparing voltage measurements across these resistive loads, engineers can estimate the **current a person might be exposed to**, and thereby assess shock risk.

### 3. Validating Bonding System Effectiveness

- > A properly bonded system should:
  - Keep voltages low under increasing fault stress.
  - Exhibit a more or less linear response with increasing voltage and distance.
- Exhibit **consistent attenuation** of voltage with increasing distance from the pool edge. Multi-voltage and multi-load testing ensures a thorough evaluation of how the bonding system would perform during real-world electrical fault events, not just ideal conditions.



#### V. Findings and Test Results

#### Table 1 - Site Descriptions

Pool	•		Deck	Bonding		Test			
ID	Address	Address Pool Type Type Type		-	Soil Type Date(s)		T (°F)	H (%)	
1	10961 Prairie Hawk Dr, Orlando, FL 32837	Concrete	Concrete	#8 AWG Wire Loop	Myakka Fine Sand	4/7/2025	84	51	
2	667 Linville Falls Dr, West Melbourne, FL 32904	Concrete	Concrete	Copper Grid	Eau Gallie Fine Sand	4/8/2025 4/16/2025	66	75	
3	1906 Summerfield Rd, Winter Park, FL 32792	Concrete	Paver	Copper Grid	Smyrna Sand	4/9/2025 4/16/2025	65 / 76	70 / 30	
4	17909 Lookout Hill Rd, Winter Garden, FL 34787	Fiberglass	Paver	Inline Bonding	Candler Sand	4/9/2025 4/14/2025	74 / 69	41 / 62	
5	13331 Sugarloaf Ct, Clermont, FL 34715	Fiberglass	Concrete	Inline Bonding	Tavares Sand	4/14/2025	76	56	
6	20451 Fieldcrest Ct, Clermont, FL 34715	Fiberglass	Concrete	Inline Bonding	Tavares Sand	4/14/2025 6/12/2025	76 / 91	56 / 61	
7	5753 Timber Mdw Wy, St Cloud, FL 34771	Concrete	Concrete	#8 AWG Wire Loop	Pineda Fine Sand	4/15/2025	72	64	
8	1512 Pines End Pl, St Cloud, FL 34771	Concrete	Concrete	#8 AWG Wire Loop	Tavares Sand	4/15/2025	72	64	
9	590 Dinner St NE, Palm Bay, FL 32907	Concrete	Paver	Copper Grid	Eau Gallie Fine Sand	6/12/2025	89	57	

\*\*In-line bonding in fiberglass pools indicates a stainless-steel bonding plate in the skimmer providing a direct water bond to the equipotential grid. All fiberglass pools tested used a single #8 AWG copper wire for the perimeter bonding.



#### Soil Composition and Conductivity

Soil characteristics at each pool location influence the performance of bonding systems, particularly under fault current conditions. Factors such as moisture, composition, and texture affect electrical resistivity. Below is a summary of soil profiles based on USDA NRCS and Florida Geological Survey data for each site:

Pool ID	City	Soil Type Drainage Class		Electrical Conductivity (avg)				
1	Orlando	Myakka Fine Sand	Poorly Drained	Low to Moderate				
2	West Melbourne	Eau Gallie Fine Sand	Poorly Drained	Low to Moderate				
3	Winter Park	Smyrna Sand	Poorly Drained	Low to Moderate				
4	Winter Garden	Candler Sand	Excessively Drained	Low to Moderate				
5	Clermont	Tavares Sand	Excessively Drained	Low to Moderate				
6	Clermont	Tavares Sand	Excessively Drained	Low to Moderate				
7	St Cloud	Pineda Fine Sand	Poorly Drained	Low to Moderate				
8	St Cloud Pineda Fine Sand		Poorly Drained	Low to Moderate				
9	Palm Bay Pineda Fine Sand		Poorly Drained	Low to Moderate				

#### Table 2 - Soil Composition and Conductivity



#### Table 3 - Baseline Equipotential Voltage Readings

Pool		Equipmont	Maximum Voltage Reading			
	Location	Equipment	VOC	V200	V500	
ID		Status	(VAC)	(VAC)	(VAC)	
1	10961 Prairie Hawk Dr, Orlando	On	0.131	0.032	0.054	
_ <b>_</b>	10901 Flame Hawk DI, Offando	Off	0.176	0.059	0.117	
2	667 Linville Falls Dr, West	On	0.009	0.006	0.006	
2	Melbourne	Off	0.011	0.009	0.009	
3	1906 Summerfield Rd, Winter Park	On	0.005	0.003	0.004	
5	1900 Summerneid Ru, Winter Park	Off	0.008	0.007	0.008	
4	17909 Lookout Hill Rd, Winter	On	0.118	0.082	0.065	
4	Garden	Off	0.173	0.123	0.064	
5	13331 Sugarloaf Ct, Clermont	On	0.047	0.021	0.011	
5	15551 Sugarioar Ct, Clermont	Off	0.031	0.016	0.009	
6	20451 Fieldcrest Ct, Clermont	On	0.037	0.025	0.016	
0		Off	0.028	0.022	0.017	
7	5753 Timber Meadow Wy, St	On	0.011	0.017	0.032	
	Cloud	Off	0.008	0.010	0.011	
8	1512 Pines End Pl, St Cloud	On	0.043	0.015	0.014	
0	1512 FILLES ELLU FI, SUCIOUU	Off	0.017	0.012	0.011	
9	590 Dinner St NE, Palm Bay	On	0.016	0.003	0.003	
5	590 Diffier St NE, Pallit Bay	Off	0.010	0.004	0.001	

#### Table 3A - Summary of Median Baseline Equipotential Voltage Readings

Equipment Status	VOC Median (VAC)	V200 Median (VAC)	V500 Median (VAC)
On	0.043	0.025	0.020
Off	0.035	0.018	0.016

- > All baseline measurements were low, typically under 0.2 VAC.
- Turning pool equipment ON (e.g., pumps, lighting) resulted in only minor increases in measured voltage (typically <0.05 VAC). The low-level values could have also been affected by electrical current in the ground external to the pool environment.
- The small difference in V500 from OFF to ON conditions indicates that the bonding systems effectively suppressed operational voltage gradients
- The mean V500 voltage with equipment on was approximately 0.020 VAC, translating to 0.04 mA, well below any known safety concern.



- > No indication of circulating current or bonding deficiencies was detected due to equipment operation.
- > The minimal differences between on and off conditions suggest that bonding continuity and system integrity are sound across all tested pools.



Pool		Test Voltage	VOC	V200	V500
ID	Location	(VAC)	(VAC)	(VAC)	(VAC)
-		60	0.227	0.082	0.154
1	10961 Prairie Hawk Dr, Orlando	90	0.324	0.142	0.217
		120	0.446	0.193	0.260
	667 Linville Falle Dr. West	60	0.011	0.008	0.010
2	667 Linville Falls Dr, West Melbourne	90	0.011	0.008	0.005
	Melbourne	120	0.011	0.008	0.006
	1006 Summarfield Dd Winter	60	0.020	0.015	0.007
3	1906 Summerfield Rd, Winter Park	90	0.032	0.009	0.005
		120	0.042	0.020	0.010
	17909 Lookout Hill Rd, Winter Garden	60	0.155	0.115	0.073
4		90	0.248	0.187	0.117
		120	0.353	0.252	0.183
	13331 Sugarloaf Ct, Clermont	60	0.138	0.084	0.052
5		90	0.203	0.127	0.075
		120	0.257	0.174	0.105
		60	0.774	0.634	0.472
6	20451 Fieldcrest Ct, Clermont	90	1.548	1.076	0.745
		120	2.084	1.545	1.122
	E7E2 Timber Meadow M/v. St	60	0.021	0.024	0.021
7	5753 Timber Meadow Wy, St Cloud	90	0.032	0.037	0.030
		120	0.031	0.034	0.040
		60	0.027	0.015	0.012
8	1512 Pines End Pl, St Cloud	90	0.022	0.020	0.009
		120	0.052	0.044	0.016
		60	0.050	0.007	0.027
9	590 Dinner St NE, Palm Bay	90	0.082	0.031	0.031
		120	0.114	0.042	0.042

## Table 4 - Summary of Equipotential Voltage Readings Under Simulated Fault Conditions



Voltage	Load	Mean (VAC)	Std Dev	Min	Max	95% Confidence Interval
	VOC	0.142	0.229	0.007	0.774	0.176
60 VAC	V200	0.100	0.183	0.003	0.634	0.141
	V500	0.071	0.121	0.002	0.472	0.093
	VOC	0.246	0.452	0.009	1.548	0.347
90 VAC	V200	0.160	0.301	0.005	1.076	0.231
	V500	0.111	0.191	0.003	0.745	0.147
	VOC	0.343	0.620	0.007	2.084	0.477
120 VAC	V200	0.227	0.435	0.003	1.545	0.334
	V500	0.161	0.288	0.004	1.122	0.222

#### Table 4A - Aggregate Statistical Summary

#### Key Observations:

- V500 values remain well below 1.0 VAC for all pools except Pool #6 at 120 VAC (1.122 VAC), which is attributed to high soil moisture, site-specific conditions, or other anomalies.
- > The mean V500 at 120 VAC is 0.161 VAC, with 7 out of 9 pools below 0.25 VAC.
- The highest variability occurs in VOC readings at higher voltages (std. dev. 0.620 at 120 VAC), again due to Pool #6.
- Linear voltage response across the three fault levels confirms bonding effectiveness and field repeatability.



Donding Turo	Pools	V500 @ 60V	V500 @ 90V	V500 @	Mean V500
Bonding Type	Included	(VAC)	(VAC)	120V (VAC)	(All Voltages)
#8 AWG Wire Loop	Pools 1, 7, 8	0.154	0.217	0.260	0.210
Copper Grid	Pools 2, 3, 9	0.027	0.031	0.042	0.033
Water Bond Plate &					
Inline Bonding & #8	Pools 4, 5	0.073	0.117	0.183	0.124
Loop					
Pool #6 Only	Pool 6	0.472	0.745	1.122	0.780

#### Table 5 - V500 Voltage Summary by Bonding Type

- Pool #6 yielded results that are far outside of the normal range of the other pools tested. This may have been due to soil anomalies, issues with the pool bonding system, or other external circumstances.
- By isolating Pool #6, the performance of the fiberglass pools with water bond plate and #8
   AWG perimeter loop method under more typical conditions (Pools 4 and 5) shows average
   V500 values well within acceptable industry benchmarks.
- Aside from <u>Pool #6</u>, all bonding types, including #8 AWG loop and copper grid, remained below
   0.25 VAC across all voltages, with no outliers.



Voltage	Distance	Test #1 - 4/14/2025			Test #2- 6/12/2025			
voltage	from Water	VOC	V200	V500	VOC	V200	V500	
	1	0.751	0.634	0.472	0.805	0.249	0.451	
	2	0.772	0.593	0.385	0.812	0.243	0.498	
60 VAC	3	0.774	0.566	0.32	0.816	0.294	0.539	
	4	0.753	0.616	0.405	0.816	0.279	0.533	
	5	0.771	0.627	0.419	0.812	0.243	0.487	
	1	1.429	1.076	0.745	1.216	0.311	0.665	
	2	1.456	1.073	0.606	1.223	0.403	0.725	
90 VAC	3	1.521	0.947	0.497	1.222	0.423	0.826	
	4	1.548	0.942	0.632	1.226	0.376	0.757	
	5	1.533	0.938	0.647	1.232	0.326	0.757	
	1	1.981	1.545	1.122	1.643	0.477	1.158	
	2	2.081	1.435	0.848	1.641	0.496	1.163	
120 VAC	3	2.084	1.320	0.752	1.600	0.626	1.222	
	4	2.083	1.416	0.873	1.652	0.526	1.198	
	5	2.054	1.454	1.112	1.661	0.540	1.186	

#### Table 5A – Verification Testing of Pool #6

- Upon completion of all testing Pool #6 was found to be a major outlier due to the elevated voltage readings taken in comparison to the other eight pools. Because of this it was deemed necessary to return and perform confirmation testing to rule out equipment issues or other aspects that may have provided erroneous results.
- As Table 5A shows above the verification testing performed on 6/12 yielded readings that, more or less, confirm the original readings.
- Table 5B below displays the percentage and voltage differences between Test #1 and Test #2. The comparison indicates nearly equivalent or lower readings is Test #2 than Test #1 for VOC and V200 testing across all voltages. For V500 testing the second test yielded somewhat higher results than the original test.
- These differences notwithstanding, the verification measurements remained within the same general range as the original data and were significantly higher than in the other eight test sites.
- Based on this it can be assumed that the data collected is sound and indicates a potential issue with the bonding grid, an unknown electrical anomaly present in the ground, or some other external cause.

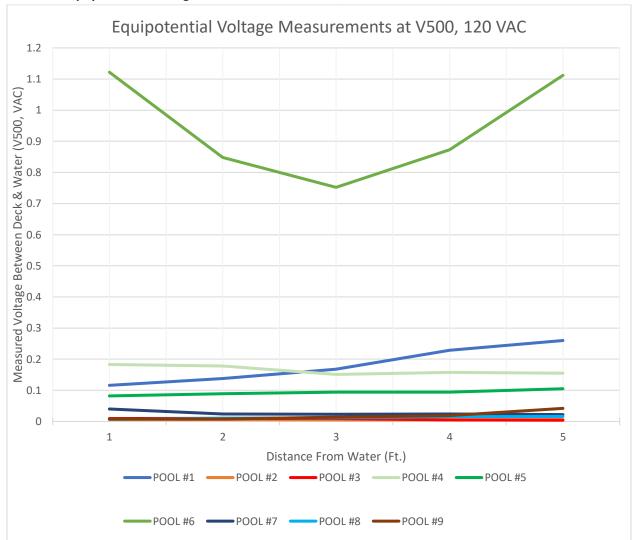


- It should be noted that even though the V500 readings at 120 VAC "fail" the threshold test they do seem to represent an "edge case" due to the slight voltage overage. According to the IEEE paper entitled "Determining Voltage Levels of Concern for Human and Animal Response to AC Current" written by Douglass Dorr, "The applicable voltage level that applies to the contact scenario and to the human species would yield a minimum voltage level of perception at 1.0 to 1.25 volts..." which would seem to indicate that the voltage threshold should be moved from 1 V to 1.25 V and also illustrates the range of "acceptable" touch voltage limits.
- Bonding continuity between the pool equipment and metal components (pool enclosure frame, handrail, etc.) was verified prior to voltage testing.
- There may have been other, unknown current sources in the ground on this property which may have contributed to the readings. Investigation into this or other causes of stray current was not performed or included in the scope of this study.

Voltage	Distance	% Diff. b	etween Test #2	& Test #1	Voltage Diff. b	etween Test #2 8	& Test #1 (VAC)
voitage	from Water	VOC	V200	V500	VOC	V200	V500
	1	7.2%	-60.7%	-4.4%	0.054	-0.385	-0.021
	2	5.2%	-59.0%	29.4%	0.040	-0.350	0.113
60 VAC	3	5.4%	-48.1%	68.4%	0.042	-0.272	0.219
	4	8.4%	-54.7%	31.6%	0.063	-0.337	0.128
	5	5.3%	-61.2%	16.2%	0.041	-0.384	0.068
	1	-14.9%	-71.1%	-10.7%	-0.213	-0.765	-0.080
90 VAC	2	-16.0%	-62.4%	19.6%	-0.233	-0.670	0.119
	3	-19.7%	-55.3%	66.2%	-0.299	-0.524	0.329
	4	-20.8%	-60.1%	19.8%	-0.322	-0.566	0.125
	5	-19.6%	-65.2%	17.0%	-0.301	-0.612	0.110
	1	-17.1%	-69.1%	3.2%	-0.338	-1.068	0.036
	2	-21.1%	-65.4%	37.1%	-0.440	-0.939	0.315
120 VAC	3	-23.2%	-52.6%	62.5%	-0.484	-0.694	0.470
	4	-20.7%	-62.9%	37.2%	-0.431	-0.890	0.325
	5	-19.1%	-62.9%	6.7%	-0.393	-0.914	0.074

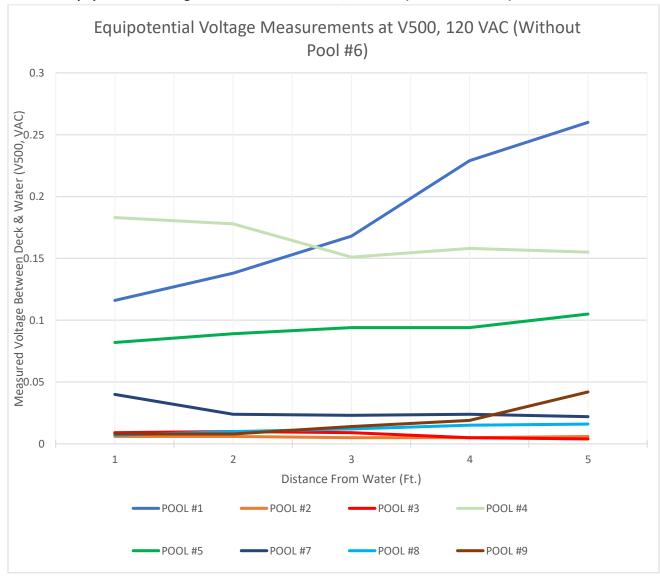
Table 5B – Summary of Differences Between Test #1 & #2 for Pool #6















Pool		Equivalent Current at V500 (	mA)
PUUI	60V	90V	120V
1	0.308	0.434	0.52
2	0.02	0.01	0.012
3	0.014	0.01	0.02
4	0.146	0.234	0.366
5	0.104	0.15	0.21
6	0.944	1.49	2.244
7	0.042	0.06	0.08
8	0.024	0.018	0.032
9	0.054	0.062	0.084

#### Table 6 - Equivalent Current (mA) by Pool, Voltage, and V500 Measurement

Table 6A - Summary of V500 Current by	y Bonding Type (at 120 VAC)
---------------------------------------	-----------------------------

Bonding Type	Pools Included	Max V500 (VAC)	I (mA) @ 500Ω	Pass/Fail (<1 mA)
#8 AWG Copper Wire Loop	1, 7, 8	0.260	0.520	Pass
Copper Grid (Steel- Reinforced)	2, 3, 9	0.042	0.084	Pass
Water Bond Plate & Inline Bonding with #8 AWG Loop	4, 5	0.183	0.366	Pass
Pool #6 Only	6	1.122	2.244	🛕 Questionable

- All pools except Pool #6 produced V500 currents well under 2 mA, which is widely regarded as a safe upper limit for barefoot human contact in wet conditions.
  - Pool #6 is listed as "Questionable" due to disagreements with safe voltage limits of either 1 V (2 mA at 500 Ω) or 1.25V (2.5 mA at 500 Ω) as presented in "Determining Voltage Levels of Concern for Human and Animal Response to AC Current"
- The pool's utilizing the copper grid perimeter bonding exhibited the lowest equipotential voltage (best performance) and resulting current of all pools tested.
- Pool #6 exceeded 2 mA, more than double the recommended limit. The root cause of this difference in comparison to the other pools has not been ascertained.
- The #8 AWG copper wire loop & copper grid bonding systems all demonstrated acceptable safety margins in typical conditions.
- The test validates that multiple bonding configurations can be compliant, provided they are properly installed and local conditions (e.g., soil, moisture) are managed or mitigated.



#### **VI. Conclusions & Commentary**

Based on the comprehensive field testing, voltage gradient measurements, and statistical analysis conducted across nine residential pools in Central Florida, this study concludes that **both bonding methods**—#8 AWG copper wire loop and the copper bonding grid— **can provide effective equipotential bonding when properly installed** under the fault conditions simulated and measured. The data show that under simulated fault conditions up to 120 VAC, nearly all measured V500 voltages yielded current levels well below 1 mA when modeled against a 500-ohm human resistance, a widely accepted safety benchmark. The only exception was a single pool (Pool #6) using the water bond plate method with a #8 AWG copper wire loop, which exhibited elevated readings attributable to unknown soil anomalies, issues with the pool bonding system, or other external circumstances. However, investigation into the root cause of this anomaly was not conducted or within the scope of this report. It should be noted that the homeowner may have had other buried electrical equipment on the property that may have contributed to this.

It is important to note that the pools evaluated in this study were not constructed under uniform conditions—they were located in different geographic areas, built by different contractors, and employed varying construction materials and installation practices. These variations introduce field variables that are not fully controlled, and naturally affect bonding system performance. Despite this, the measured results across all systems and sites consistently fell within or near the thresholds considered safe for human contact, reinforcing the overall reliability of equipotential bonding when executed per accepted design principles. During testing, the soil on the property was found to be mostly dry having not experienced precipitation in the preceding time before testing. No additional soil wetting was done during testing.

While the copper grid perimeter bonding method produced the lowest equipotential voltage values overall (**in the pools tested**), no system categorically "failed" to keep equipotential voltage levels within what can be considered "safe" parameters. Again, these were the specific results from these specific pools and differences may arise in these comparisons if a larger sample size of pools were used. These findings indicate that **both the #8 AWG copper wire loop and the copper bonding grid can meet performance expectations for voltage mitigation in residential pools** when installed properly. This report does not advocate for any specific system but provides a neutral, data-driven evaluation to assist stakeholders in making informed engineering and safety decisions.



#### VII. Bibliography

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- 4. Consumer Product Safety Commission, Electric Shock Drowning Incidents, 2002–2014
- 5. NFPA Journal, "Current Risk: Understanding Pool Bonding Hazards", 2016
- 6. IEEE Transactions on Industry Applications, Studies on Fault Current Paths in Wet Environments
- 7. IEEE 1695-2024 Guide for Understanding, Diagnosing, and Mitigating Stray and Contact Voltage
- D. Dorr, "Determining Voltage Levels of Concern for Human and Animal Response to AC Current," in Proceedings of the IEEE PES Transmission and Distribution Conference and Exposition, 2009, pp. 1–6. doi: 10.1109/TDC.2009.5167483



Appendix A – Full Voltage Gradient Test Data by Pool



POOL INFORMATION			
Pool ID	Test Pool #1		
Location	10961 Prairie Hawk Dr, Orlando, FL 32837		
Pool Type (Concrete/Fiberglass/Vinyl)	Concrete with Concrete Deck		
Bonding Type (Wire Loop/Copper Grid)	#8 copper wire loop		
Date of Test	4/7/2025		
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)		
Witnessed By	Richard Moseley (Holland Pools)		

TO EQUIPMENT GROUND					
Location 1 2 3					
Description	Pump Lug to Pool Panel	Lighting Transformer to Pool Panel	Lighting J-box to Pool Panel		
Bonding Continuity (Ω)	1.4	0.2	0.3		

<b>Baseline Equipotential Voltag</b>	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC					
Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor						
1	0.037	0.012	0.018			
2	0.051	0.017	0.025			
3	0.091	0.026	0.038			
4	0.126	0.028	0.042			
5	0.131	0.032	0.054			

Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC					
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.069	0.038	0.038		
2	0.113	0.047	0.052		
3	0.144	0.056	0.077		
4	0.171	0.055	0.093		
5	0.176	0.059	0.117		



Simulated Fault Test: 60 VAC -	Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.084	0.033	0.036		
2	0.124	0.048	0.051		
3	0.169	0.051	0.079		
4	0.182	0.076	0.108		
5	0.227	0.082	0.154		

Simulated Fault Test: 90 VAC -	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 $\Omega$ Resistor		
1	0.091	0.056	0.073		
2	0.119	0.068	0.107		
3	0.162	0.103	0.141		
4	0.234	0.115	0.176		
5	0.324	0.142	0.217		

Simulated Fault Test: 120 VAC	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.128	0.069	0.116		
2	0.218	0.084	0.138		
3	0.314	0.104	0.168		
4	0.399	0.143	0.229		
5	0.446	0.193	0.260		

Observations	12' x 28' pool - Weather: 84 F, 51% humidity at time of test (10:00 AM) - Voltage test done connected from main bonding wire at pump to remote earth rod

## Test Completed by:

Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



POOL INFORMATION			
Pool ID	Test Pool #2		
Location	667 Linville Falls Dr, West Melbourne, FL 32904		
Pool Type (Concrete/Fiberglass/Vinyl)	Concrete with Concrete Deck		
Bonding Type (Wire Loop/Copper Grid)	Copper Grid		
Date of Test 4/8/2025 & 4/16/2025			
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)		
Witnessed By	Albert Underwood, Dustin Underwood (Aqua Blue Pools)		

TO EQUIPMENT GROUND				
Location 1 2 3				
Description	Pump Lug to Pool Panel	Lighting Transformer to Pool Panel	Lighting J-box to Pool Panel	
Bonding Continuity (Ω)	0.1	0.1	0.1	

Baseline Equipotent	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC			
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor	
1	0.005	0.004	0.004	
2	0.006	0.006	0.005	
3	0.006	0.005	0.006	
4	0.007	0.004	0.004	
5	0.009	0.004	0.004	

Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC						
	Open Circuit 200 Ω Re		esistor 500		Ω Resistor	
Distance from Water (ft)	4/8	4/16	4/8	4/16	4/8	4/16
1	0.007	0.011	0.007	0.005	0.003	0.003
2	0.007	0.009	0.007	0.005	0.004	0.005
3	0.005	0.01	0.007	0.008	0.004	0.009
4	0.007	0.009	0.005	0.009	0.004	0.001
5	0.006	0.01	0.006	0.009	0.004	0.009



Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC			
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 $\Omega$ Resistor
1	0.011	0.005	0.002
2	0.009	0.005	0.007
3	0.009	0.008	0.008
4	0.01	0.007	0.01
5	0.01	0.005	0.006

Simulated Fault Tes	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor					
1	0.01	0.008	0.003		
2	0.011	0.008	0.003		
3	0.01	0.006	0.004		
4	0.011	0.005	0.005		
5	0.01	0.005	0.005		

Simulated Fault Tes	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC			
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 $\Omega$ Resistor	
1	0.010	0.003	0.006	
2	0.011	0.008	0.006	
3	0.008	0.008	0.005	
4	0.007	0.006	0.005	
5	0.007	0.006	0.006	

Observations	4/8/2025 - 66 F, 75% humidity, Heavy rain prior to test, ground was saturated. Low soil impedance caused the fuse in the VARIAC to blow when starting ground fault testing. Rescheduling ground-fault testing for 4/16/2025 4/16/2025 - 76 F, 54% humidity
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## Test Completed by:

Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



POOL INFORMATION		
Pool ID Test Pool #3		
Location	1906 Summerfield Rd, Winter Park, FL 32792	
Pool Type (Concrete/Fiberglass/Vinyl)	Concrete with Paver Deck	
Bonding Type (Wire Loop/Copper Grid)	Copper Grid	
Date of Test	4/7/2025	
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)	
Witnessed By	Brad Quehl (Holland Pools), Richard Smith (SunSmart Engineering)	

TO EQUIPMENT GROUND			
Location 1 2 3			3
Description	Pump Lug to Pool Panel	Lighting Transformer to Pool Panel	Lighting J-box to Pool Panel
Bonding Continuity (Ω)	0.2	0.2	0.3

Baseline Equipotential Voltag	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC				
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor				
1	0.005	0.002	0.002		
2	0.005	0.003	0.002		
3	0.005	0.002	0.002		
4	0.005	0.002	0.002		
5	0.005	0.002	0.004		

Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC			
Distance from Water (ft)	Open Circuit	200 $\Omega$ Resistor	500 Ω Resistor
1	0.005	0.005	0.001
2	0.005	0.003	0.002
3	0.005	0.002	0.002
4	0.006	0.002	0.002
5	0.006	0.001	0.002



Simulated Fault Test: 60 VAC	Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC			
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor	
1	0.368	0.212	0.045	
2	0.829	0.259	0.163	
3	2.568	0.289	0.331	
4	3.562	0.481	0.463	
5	6.81	0.235	0.772	

Simulated Fault Test: 90 VAC -	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor				
1	1.072	0.255	0.112		
2	0.909	0.328	0.144		
3	4.33	1.456	0.436		
4	7.84	1.601	1.135		
5	9.67	2.983	1.746		

Simulated Fault Test: 120 VAC	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor				
1	1.818	0.312	0.045		
2	2.217	0.476	0.115		
3	2.856	0.958	0.276		
4	9.170	1.976	0.712		
5	13.840	3.664	0.834		

Observations	14' x 22' pool - Weather: 65 F, 70% humidity at time of test (10:00 AM) - Voltage test done connected from main bonding wire at pump to remote earth rod - Power source for VARIAC was from non-GFCI outlet in home

## Test Completed by:

Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



	POOL INFORMATION		
Pool ID	Test Pool #4		
Location	17909 Lookout Hill Rd, Winter Garden, FL 34787		
Pool Type (Concrete/Fiberglass/Vinyl)	Fiberglass with Paver Deck		
Bonding Type (Wire Loop/Copper Grid)	In-line bonding, water bond plate in skimmer		
Date of Test	4/9/2025 & 4/14/2025		
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)		
Witnessed By	Michael Ramee (Mad River Pools)		

TO EQUIPMENT GROUND				
Location 1 2 3				
Description	Pump Lug to Pool Panel	Lighting Transformer to Pool Panel	Heat Pump Lug to Pool Panel	
Bonding Continuity (Ω)	0.4	0.2	0.4	

Baseline Equipotent	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC					
Distance from Water (ft)	Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor					
1	0.084	0.063	0.048			
2	0.091	0.071	0.043			
3	0.089	0.067	0.036			
4	0.108	0.082	0.065			
5	0.118	0.079	0.053			

Baseline Equipotentia	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC					
	Open Circuit 200 Ω Res		tesistor 500 Ω Resist		Resistor	
Distance from Water (ft)	4/9	4/14	4/9	4/14	4/9	4/14
1	0.093	0.126	0.068	0.094	0.052	0.062
2	0.109	0.141	0.059	0.099	0.027	0.064
3	0.103	0.156	0.056	0.096	0.046	0.053
4	0.124	0.163	0.056	0.102	0.045	0.043
5	0.136	0.173	0.062	0.123	0.046	0.056

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Simulated Fault Tes	Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor					
1	0.153	0.115	0.072		
2	0.138	0.102	0.073		
3	0.138	0.106	0.037		
4	0.151	0.097	0.047		
5	0.155	0.095	0.072		

Simulated Fault Tes	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC					
Distance from Water (ft)	Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor					
1	0.224	0.187	0.116			
2	0.241	0.162	0.107			
3	0.229	0.116	0.106			
4	0.228	0.152	0.112			
5	0.248	0.168	0.117			

Simulated Fault Tes	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor					
1	0.322	0.252	0.183		
2	0.341	0.245	0.178		
3	0.345	0.252	0.151		
4	0.353	0.242	0.158		
5	0.351	0.205	0.155		

Observations	15' x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool water to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (10:00 AM, 4/14)
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### Test Completed by:

Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



POOL INFORMATION					
Pool ID	Pool ID Test Pool #5				
Location 13331 Sugarloaf Ct, Clermont, FL 34715					
Pool Type (Concrete/Fiberglass/Vinyl)	Fiberglass with Concrete Deck				
Bonding Type (Wire Loop/Copper Grid) In-line bonding, water bond plate in skimmer					
Date of Test 4/14/2025					
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)				
Witnessed By Michael Ramee (Mad River Pools)					

TO EQUIPMENT GROUND				
Location 1 2 3				
Description	Pump Lug to Pool Panel	Lighting Controller to Pump Lug	Chlorinator to Pool Panel	
Bonding Continuity (Ω)	0.2	0.2	0.3	

Baseline Equipotential Voltage M	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC					
Distance from Water (ft)	Distance from Water (ft) Open Circuit 200 Ω Resistor 500 Ω Resistor					
1	0.040	0.019	0.007			
2	0.039	0.017	0.008			
3	0.042	0.016	0.010			
4	0.045	0.021	0.010			
5	0.047	0.021	0.011			

Baseline Equipotential Voltage N	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC					
Distance from Water (ft)	Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor					
1	0.027	0.015	0.005			
2	0.028	0.014	0.005			
3	0.027	0.014	0.006			
4	0.030	0.015	0.009			
5	0.031	0.016	0.008			



Simulated Fault Test: 60 VAC - E	Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 $\Omega$ Resistor	500 $\Omega$ Resistor		
1	0.135	0.081	0.049		
2	0.126	0.080	0.042		
3	0.094	0.084	0.041		
4	0.138	0.064	0.052		
5	0.135	0.056	0.046		

Simulated Fault Test: 90 VAC - E	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 $\Omega$ Resistor	500 Ω Resistor		
1	0.190	0.127	0.062		
2	0.191	0.123	0.071		
3	0.195	0.117	0.075		
4	0.197	0.117	0.066		
5	0.203	0.121	0.052		

Simulated Fault Test: 120 VAC - E	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.257	0.169	0.082		
2	0.230	0.159	0.089		
3	0.245	0.155	0.094		
4	0.248	0.164	0.094		
5	0.238	0.174	0.105		

Observations	12' x 31' pool - Weather: 76 F, 56% humidity at time of test (11:00 AM) - Water bonding plate installed in skimmer - Voltage test done connected directly to pool water to remote earth rod

#### Test Completed by:

Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



PC	POOL INFORMATION		
Pool ID	Test Pool #6		
Location	20451 Fieldcrest Ct, Clermont, FL 34715		
Pool Type (Concrete/Fiberglass/Vinyl)	Fiberglass with Concrete Deck		
Bonding Type (Wire Loop/Copper Grid)	In-line bonding, water bond plate in skimmer		
Date of Test	t 4/14/2025		
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)		
Witnessed By			

TO EQUIPMENT GROUND				
Location 1 2 3				
Description	Pump Lug to Pool Panel	Heat Pump Lug to Pump Lug	Lighting Transformer to Pool Panel	
Bonding Continuity (Ω)	0.5	0.2	0.2	

Baseline Equipotential Voltage M	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 $\Omega$ Resistor	500 Ω Resistor		
1	0.023	0.022	0.014		
2	0.027	0.019	0.015		
3	0.032	0.025	0.014		
4	0.025	0.019	0.015		
5	0.037	0.021	0.016		

Baseline Equipotential Voltage Me	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 $\Omega$ Resistor	500 Ω Resistor		
1	0.028	0.017	0.017		
2	0.023	0.018	0.015		
3	0.025	0.017	0.015		
4	0.023	0.021	0.014		
5	0.024	0.022	0.017		



Simulated Fault Test: 60 VAC - E	Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 $\Omega$ Resistor		
1	0.751	0.634	0.472		
2	0.772	0.593	0.385		
3	0.774	0.566	0.320		
4	0.753	0.616	0.405		
5	0.771	0.627	0.419		

Simulated Fault Test: 90 VAC - I	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 $\Omega$ Resistor		
1	1.429	1.076	0.745		
2	1.456	1.073	0.606		
3	1.521	0.947	0.497		
4	1.548	0.942	0.632		
5	1.533	0.938	0.647		

Simulated Fault Test: 120 VAC - I	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 $\Omega$ Resistor		
1	1.981	1.545	1.122		
2	2.081	1.435	0.848		
3	2.084	1.320	0.752		
4	2.083	1.416	0.873		
5	2.054	1.454	1.112		

Observations	15' x 30' pool - Weather: 76 F, 56% humidity at time of test (11:45 AM) - Water bonding plate installed in skimmer - Voltage test done connected directly to pool water to remote earth rod	

#### **Test Completed by:**

Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



POOL INFORMATION		
Pool ID Test Pool #6b		
Location 20451 Fieldcrest Ct, Clermont, FL 34715		
Pool Type (Concrete/Fiberglass/Vinyl) Fiberglass with Concrete Deck		
Bonding Type (Wire Loop/Copper Grid) In-line bonding, water bond plate in skimmer		
Date of Test 6/12/2025		
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)	
Witnessed By	Michael Ramee (Mad River Pools), Adam Alstott (Tropical Pools)	

TO EQUIPMENT GROUND			
Location 1 2 3			
Description			
Bonding Continuity (Ω)			

Baseline Equipotential Voltage M	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC				
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor				
1					
2					
3					
4					
5					

Baseline Equipotential Voltage N	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC				
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor				
1					
2					
3					
4					
5					



Simulated Fault Test: 60 VAC - E	Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor				
1	0.805	0.249	0.451		
2	0.812	0.243	0.498		
3	0.816	0.294	0.539		
4	0.816	0.279	0.533		
5	0.812	0.243	0.487		

Simulated Fault Test: 90 VAC - E	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resisto				
1	1.216	0.311	0.665		
2	1.223	0.403	0.725		
3	1.222	0.423	0.826		
4	1.226	0.376	0.757		
5	1.232	0.326	0.757		

Simulated Fault Test: 120 VAC - E	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC					
Distance from Water (ft)	Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor					
1	1.643	0.477	1.158			
2	1.641	0.496	1.163			
3	1.600	0.626	1.222			
4	1.652	0.526	1.198			
5	1.661	0.540	1.186			

	15' x 30' pool - Weather: 91 F, 61% humidity at time of test (1:00
	PM) - Water bonding plate installed in skimmer - Voltage test
	done connected directly to pool water to remote earth rod. ONLY
Observations	FAULT VOLTAGE TESTING CONDUCTED TO CONFIRM PREVIOUS
Observations	MEASURMENTS. Homeowner present stated that he had installed
	24 VAC lights to the screen enclosure which was bonded to the
	pool. He stated some of this voltage may be increasing the
	voltage present in the pool.

## Test Completed by:

Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



POOL INFORMATION		
Pool ID Test Pool #7		
Location 5753 Timber Meadow Wy, St Cloud, FL 34771		
Pool Type (Concrete/Fiberglass/Vinyl) Concrete with Concrete Deck		
Bonding Type (Wire Loop/Copper Grid) #8 copper wire loop		
Date of Test 4/15/2025		
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)	
Witnessed By	Richard Moseley (Holland Pools)	

TO EQUIPMENT GROUND					
Location 1 2 3					
Description	Pump Lug to Lighting J- box	Lighting Transformer to Pump Lug	Lighting Transformer to Pool Panel		
Bonding Continuity (Ω)	0.1	0.3	0.2		

Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC							
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor						
1	0.011	0.007	0.032				
2	0.007	0.008	0.012				
3	0.010	0.017	0.016				
4	0.009	0.011	0.012				
5	0.008	0.009	0.010				

Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC							
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor						
1	0.008	0.008	0.008				
2	0.006	0.008	0.008				
3	0.008	0.008	0.011				
4	0.007	0.009	0.010				
5	0.008	0.010	0.009				



Simulated Fault Test: 60 VAC - E	Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC						
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor						
1	0.021	0.022	0.013				
2	0.018	0.024	0.016				
3	0.017	0.020	0.015				
4	0.021	0.017	0.021				
5	0.016	0.021	0.019				

Simulated Fault Test: 90 VAC - E	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC						
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor						
1	0.024	0.025	0.030				
2	0.029	0.025	0.026				
3	0.024	0.027	0.020				
4	0.032	0.027	0.023				
5	0.028	0.037	0.019				

Simulated Fault Test: 120 VAC - E	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC						
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor						
1	0.030	0.029	0.040				
2	0.022	0.030	0.024				
3	0.027	0.028	0.023				
4	0.031	0.027	0.024				
5	0.029	0.034	0.022				

#### Test Completed by:

Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



POOL INFORMATION			
Pool ID	Test Pool #8		
Location	1512 Pines End Pl, St Cloud, FL 34771		
Pool Type (Concrete/Fiberglass/Vinyl)	Concrete with Concrete Deck		
Bonding Type (Wire Loop/Copper Grid)	#8 copper wire loop		
Date of Test	4/15/2025		
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)		
Witnessed By	Richard Moseley (Holland Pools)		

TO EQUIPMENT GROUND					
Location 1 2 3					
Description	Pump Lug to Pool Panel	Lighting J-box to Pump Lug	Lighting Transformer to Pool Panel		
Bonding Continuity (Ω)	0.8	0.5	0.5		

Baseline Equipotential Voltage Mea	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC					
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor					
1	0.015	0.006	0.004			
2	0.015	0.007	0.004			
3	0.037	0.008	0.010			
4	0.043	0.015	0.014			
5	0.037	0.012	0.009			

Baseline Equipotential Voltage Mea	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC					
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor					
1	0.012	0.012	0.005			
2	0.015	0.007	0.005			
3	0.017	0.010	0.006			
4	0.016	0.011	0.011			
5	0.017	0.009	0.009			



Simulated Fault Test: 60 VAC - Equ	Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC					
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resisto					
1	0.012	0.014	0.005			
2	0.016	0.015	0.008			
3	0.016	0.011	0.012			
4	0.021	0.010	0.009			
5	0.027	0.011	0.006			

Simulated Fault Test: 90 VAC - Equ	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.012	0.012	0.007		
2	0.016	0.014	0.007		
3	0.016	0.015	0.008		
4	0.019	0.016	0.009		
5	0.022	0.020	0.006		

Simulated Fault Test: 120 VAC - Equ	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 $\Omega$ Resistor	500 Ω Resistor		
1	0.022	0.007	0.007		
2	0.030	0.010	0.010		
3	0.046	0.022	0.012		
4	0.052	0.038	0.015		
5	0.046	0.044	0.016		

Observations	15' x 30' pool - Weather: 72 F, 64% humidity at time of test (11:00 AM) - Voltage test done connected from main bonding wire at pump to remote earth rod

## Test Completed by:

Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



POOL INFORMATION		
Pool ID Test Pool #9		
Location	590 Dinner St NE, Palm Bay, FL 32907	
Pool Type (Concrete/Fiberglass/Vinyl)	Concrete with Concrete Deck	
Bonding Type (Wire Loop/Copper Grid)	Copper Grid	
Date of Test	6/12/2025	
Tested By	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering)	
Witnessed By		

TO EQUIPMENT GROUND				
Location 1 2 3				
Description	Heater to Pump	Pump to Controller	Lighting Xfrmr to Controller	
Bonding Continuity (Ω)	0.1	0.1	0.3	

Baseline Equipotential Voltage Mea	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.007	0.001	0.001		
2	0.016	0.003	0.001		
3	0.012	0.002	0.002		
4	0.008	0.003	0.002		
5	0.009	0.003	0.003		

Baseline Equipotential Voltage Me	Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.006	0.004	0.001		
2	0.006	0.003	0.001		
3	0.007	0.002	0.001		
4	0.007	0.001	0.001		
5	0.010	0.001	0.001		



Simulated Fault Test: 60 VAC - Equ	Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC					
Distance from Water (ft)	Distance from Water (ft)Open Circuit200 Ω Resistor500 Ω Resistor					
1	0.008	0.006	0.007			
2	0.008	0.003	0.009			
3	0.010	0.005	0.010			
4	0.029	0.007	0.019			
5	0.050	0.006	0.027			

Simulated Fault Test: 90 VAC - Equ	Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.010	0.005	0.005		
2	0.009	0.004	0.005		
3	0.018	0.007	0.010		
4	0.046	0.013	0.023		
5	0.082	0.019	0.031		

Simulated Fault Test: 120 VAC - Equ	Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.010	0.005	0.008		
2	0.011	0.003	0.008		
3	0.018	0.002	0.014		
4	0.060	0.002	0.019		
5	0.114	0.003	0.042		

12K gallon free-form pool, 89 F, 57% humidity at time of test (10:00 AM) - Voltage test done connected from main bonding wire at pump to remote earth rod

## Test Completed by:

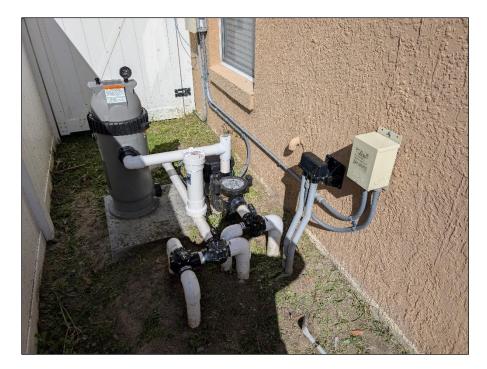
Name:	Kristoffer Costa	Name:	John Antonelli
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineering



**Appendix B – Site Photos** 







Pool #1 - 10961 Prairie Hawk Dr, Orlando, FL 32837







Pool #2 – 667 Linville Falls Dr, West Melbourne, FL 32904

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Pool #3 – 1906 Summerfield Rd, Winter Park, FL 32792







Pool #4 – 17909 Lookout Hill Rd, Winter Garden, FL 34787

SunSmart Engineering | www.sunsmartengineering.com Page 60 of 66



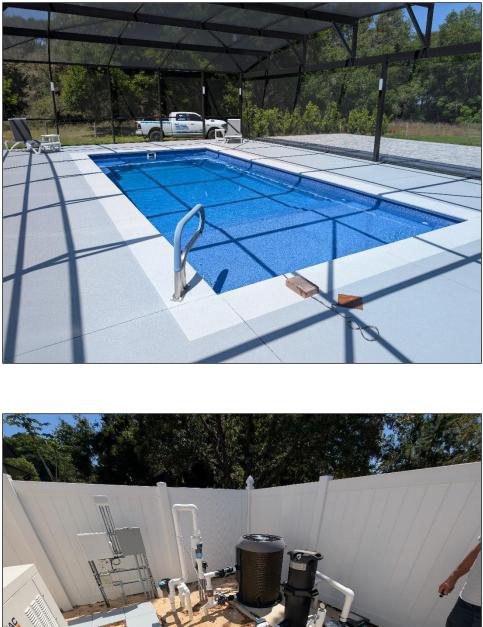




Pool #5 – 13331 Sugarloaf Ct, Clermont, FL 34715

SunSmart Engineering | www.sunsmartengineering.com Page 61 of 66







Pool #6 – 20451 Fieldcrest Ct, Clermont, FL 34715

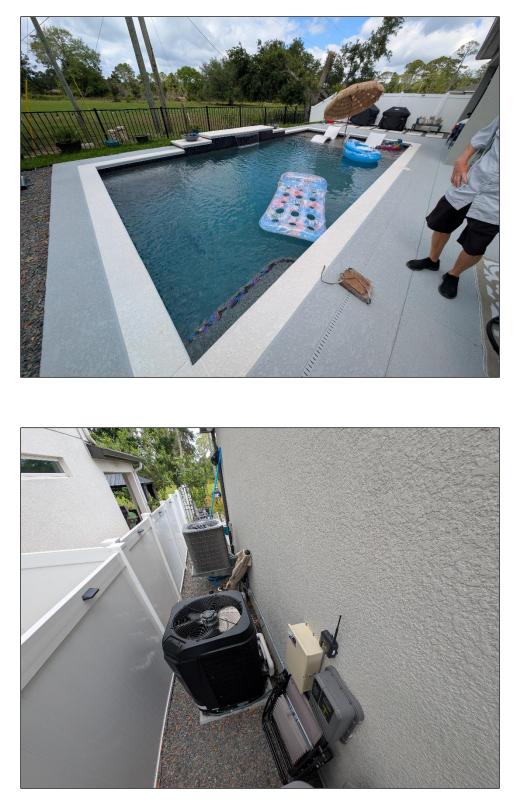






Pool #7 – 5753 Timber Meadow Wy, St Cloud, FL 34771





Pool #8 – 1512 Pines End Pl, St Cloud, FL 34771







Pool #9 – 590 Dinner St NE, Palm Bay, FL 32907



## Appendix C – Industrial Inspection and Analysis (IIA) Test Report TR\_18836-25

Test Report# TR\_18836-25\_Pool Bonding Test\_ Revision: 1





# Test Report: Pool Bonding Test Applicant: SunSmart Engineering

Signature:	Into D. Bog	Sr. EMC Engineer EMC-003838-NE
Name & Title:	Tim Royer, EMC Engineer	GINE
Date of Signature _	6/11/2025	
Signature:	Kth Ch	
Name & Title:	Kristoffer Costa, EMC Technicia	n
Date of Signature	6/11/2025	

This test report relates only to the items tested as identified and is not valid for any subsequent changes or modifications made to the equipment under test.



## Table of Contents

1.	1	APPLICA	ANT INFORMATION	3
	1.1	Test	Result Summary	3
2.	I	LOCATIO	ON OF TESTING	4
	2.1	Test	LABORATORY	4
3.	-	TEST SA	MPLE(S) (EUT/DUT)	4
	3.1	Desc	RIPTION OF THE LOCATION	5
	3.2	Test	Setup of Location	6
4.	-	test me	THODS & APPLICABLE REGULATORY LIMITS	7
	4.1	Test	methods/Standards/Guidance	7
5.	1	MEASUF		7
6.	F	enviro	NMENTAL CONDITIONS	7
7.	I	LIST OF	TEST EQUIPMENT AND TEST FACILITY	8
8.	-	TEST RE	SULTS	9
	8.1	Volt	AGE GRADIENT TESTING	
	8.2	Bone	ding System Continuity Testing (Resistance to Ground)	
	8.3	Test	Дата	
	ξ	8.3.1	Test Data, Pool #1, 10961 Prairie Hawk Dr, Orlando, FL	
		8.3.2	Test Data, Pool #2, 667 Linville Falls Dr. W. Melbourne, FL	
		8.3.3	Test Data, Pool #3a, 1906 Summerfield Road Winter Park, FL	
		8.3.4	Test Data, Pool #3b, RECHECK, 1906 Summerfield Road Winter Park, FL	
		8.3.5	Test Data, Pool #4, 17909 Lookout Hill Rd, Winter Garden, FL	
		8.3.6	Test Data, Pool #5, 13331 Sugarloaf Ct, Clermont, FL	
		8.3.7	Test Data, Pool #6a, 20541 Fieldcrest Ct, Clermont, FL	
		8.3.8	Test Data, Pool #6b, RECHECK, 20541 Fieldcrest Ct, Clermont, FL	
	8	8.3.9	Test Data, Pool #7, 5753 Timber Meadow Way, St Cloud, FL	
	8	8.3.10	Test Data, Pool #8, 1512 Pines End Pl, St Cloud, FL	
	8	8.3.11	Test Data, Pool #9, 590 Dinner St NE Palm Bay, FL	
9.	/	ANNEX-	B – TEST SETUP PHOTOGRAPHS	24
10	. ł	HISTOR	Y OF TEST REPORT CHANGES	24



## 1. Applicant Information

Applicant:SunSmart EngineeringAddress:255 Primera BoulevardSuite 160Lake Mary FL 32746 United States

## 1.1 Test Result Summary

The following test procedure was used EPRI Equipotential Bonding Validation Procedure. Full test results are available in this report.

No additions to the test methods were needed. There were no deviations, or exclusions from the test methods. No test results are from external providers or from the customer. The test results relate only to the items tested. Timco does not offer opinions and interpretations, only a pass/fail statement.

Applicable Clauses from Part 15.236		
Clauses Description of the requirements		Result:
	Voltage Gradient Testing	See Data
2020 NEC 250.53	Bonding System Continuity Testing (Resistance to Ground)	See Data



## 2. Location of Testing

## 2.1 Test Laboratory

Timco Engineering Inc. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA").Located at IIA's permanent laboratory located at 13146 NW 86<sup>th</sup> Drive, Suite 400, Alachua, Florida 32615.

FCC test firm # 578780 FCC Designation # US1070 FCC site registration is under A2LA certificate # 0955.01 ISED Canada test site registration # 2056A EU Notified Body # 1177 For all designations see A2LA scope # 0955.01

## 3. Test Sample(s) (EUT/DUT)

The test sample was received: 2/7/2025

Dates of Testing: 4/7/2025-4/9/2025, 4/14/2025-4/16/2025, 5/26/2025, 6/10/2025



## 3.1 Description of the Location

Testing was performed at the following locations:

- 1. 10961 Prairie Hawk Dr, Orlando, FL 32837
  - 1. Owner Noel Ramsaroop
  - 2. Pool Type Concrete #8 wire bonding
  - 3. Contractor Holland Pools
- 2. 667 Linville Falls Dr. W. Melbourne, FL 32904
  - 1. Owner Colwell
  - 2. Pool Type Concrete Copper Grid Bonding
  - 3. Contractor Aqua Blue Pools
  - 4. Gate Code #8600
- 3. 1906 Summerfield Road Winter Park, FL 32792
  - 1. Owner Dane Norman
  - 2. Pool Type Concrete Copper Grid Bonding
  - 3. Contractor Holland Pools
- 4. 17909 Lookout Hill Rd, Winter Garden, FL 34787
  - 1. Owner –Kyle Creeden
  - 2. Pool Type Fiberglass
  - 3. Contractor Mad River Pool Construction Inc.
- 5. 13331 Sugarloaf Ct, Clermont, FL 34715
  - 1. Owner –Elizabeth & Jim Agar
  - 2. Pool Type Fiberglass
  - 3. Contractor Mad River Pool Construction Inc.
- 6. 20451 Fieldcrest Ct, Clermont, FL 34715
  - 1. Owner Raymond Eme
  - 2. Pool Type Fiberglass
  - 3. Contractor Mad River Pool Construction Inc.
- 7. 5753 Timber Meadow Way, St Cloud, FL 34771
  - 1. Owner Steve Mitchell
  - 2. Pool Type Concrete
  - 3. Contractor Holland Pools
- 8. 1512 Pines End Pl, St Cloud, FL 34771
  - 1. Owner Cooke
  - 2. Pool Type Concrete
  - 3. Contractor Holland Pools
- 9. 590 Dinner St NE Palm Bay, FL 3290
  - 1. Owner -Hanlon
  - 2. Pool Type Concrete Copper Grid Bonding
  - 3. Contractor Aqua Blue Pools



## 3.2 Test Setup of Location

Equipment, antenna, and cable arrangement. The setup of the equipment and cable or wire placement on the test site that produces shall be shown clearly and described. Information on the orientation of portable equipment during testing shall be included. Drawings or photographs may be used for this purpose.

Test Setups are included in the test report.



### 4. Test methods & Applicable Regulatory Limits

#### 4.1 Test methods/Standards/Guidance

The measurement was performed as per EPRI Equipotential Bonding Validation Procedure. Full test results are available in this report.

#### Limits and Regulatory Limits:

- 1) NEC 6890.26
- 2) 2020 NEC 250.53

#### 5. Measurement Uncertainty

Parameter	Uncertainty (dB)
Conducted Measurements	± 3.14 dB
Note: The uncertainties provided in this table represent	nt an expanded uncertainty expressed at
approximately the 95% confidence level using a cover	age factor of K=2.

#### 6. Environmental Conditions

#### Temperature & Humidity

Measurements performed at the test site did not exceed the following:

	Parameter	Measurement
Temperature		21 C +/- 5%
Humidity		80% +/- 5%
Barometric Press	sure	30.22 in Hg
Note: Specific	environmental conditions that are appl	icable to a specific test are available in the test result
	sect	ion.



## 7. List of Test Equipment and Test Facility

The test equipment used identified by type, manufacturer, serial number, or other identification and the date on which the next calibration or service check is due.

Description of the firmware or software used to operate EUT for testing purposes.

A complete list of all test equipment used shall be included with the test report. The manufacturer's model and serial numbers, and date of last calibration, and calibration interval shall be included.

#### List of Test Equipment

Test Equipment							
Туре	Device	Manufacturer	Model	SN#	Current Cal	Cal Due	
Multimeter	Digital Multimeter	Fluke	77	35053830	11/29/23	11/28/2026	
Power Supply	AC Variable Power Supply, 50/60 Hz, Single Ph., 120 V in, 0- 280 V out, 5 A	Staco	3PN2520- MOD	N/A	NCR	NCR	



### 8. Test Results

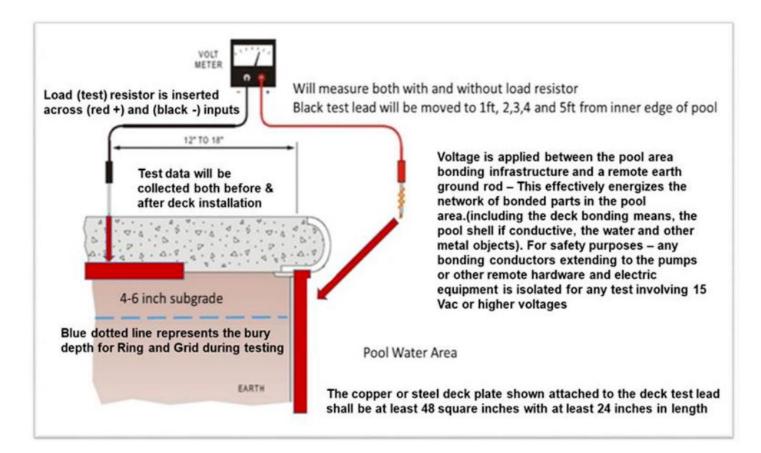
The results of the test are usually indicated in the form of tables, sample calculations, as appropriate for each test procedure.

A description and/or a block diagram of the test setup is usually provided.



### 8.1 Voltage Gradient Testing

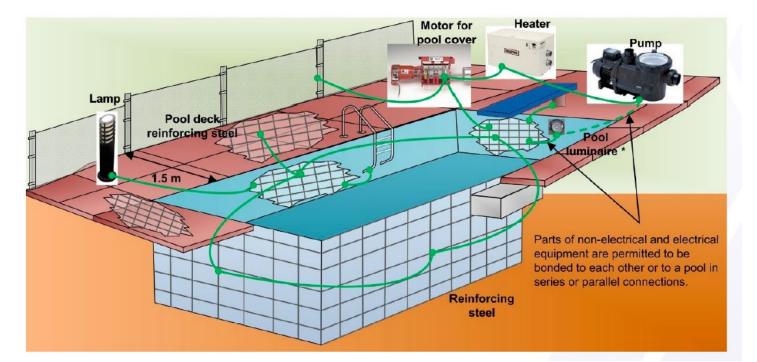
Test procedure from 2025-2-10 FSPA EPB Test Procedure.





## 8.2 Bonding System Continuity Testing (Resistance to Ground)

Limits from 2020 NEC 250.53, test procedure from 2025-2-10 FSPA EPB Test Procedure.





## 8.3 Test Data



#### 8.3.1 Test Data, Pool #1, 10961 Prairie Hawk Dr, Orlando, FL

	Pool Bonding & Equipo	otential Voltage Test Form	
		IFORMATION	
	Test Pool #1		
	10961 Prairie Hawk Dr, Orlando, FL 3	2837	
Type (Concrete/Fiberglass/Vinyl)			
ng Type (Wire Loop/Copper Grid)			
Date of Test			
Tested By	Kristoffer Costa (IIA), John Antonelli	(SunSmart Engineering)	
Witnessed By	Richard Moseley (Holland Pools)		
,			
	CONTIN	UITY TESTING	
	TO REMOTE EA	ARTH GROUND ROD	1
Location		2	3
Description			
Bonding to Earth Ground (Ω)			
	TO EQUIPI	MENT GROUND	1
Location	1	2	3
Description		Lighting Transformer to Pool Panel	Lighting J-box to Pool Panel
Bonding to Equip. Ground (Ω)	1.4	0.2	0.3
		ts - POOL EQUIPMENT ON (Water-to-De	
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.037	0.012	0.018
2	0.051	0.017	0.025
3	0.091	0.026	0.038
4	0.126	0.028	0.042
5	0.131	0.032	0.054
	Equipotential Voltage Measuremen	ts - POOL EQUIPMENT OFF (Water-to-D	eck) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.069	0.038	0.038
2	0.113	0.047	0.052
3	0.144	0.056	0.077
4	0.171	0.055	0.093
5	0.176	0.059	0.117
Simulat	ted Fault Test: 60 VAC - Equipotentia	al Voltage Measurements (Water-to-Dec	ck) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.084	0.033	0.036
2	0.124	0.048	0.051
3	0.169	0.051	0.079
4	0.182	0.076	0.108
5	0.227	0.082	0.154
Simulat	ed Fault Test: 90 VAC - Equipotentia	al Voltage Measurements (Water-to-Dec	ck) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.091	0.056	0.073
2	0.119	0.068	0.107
3	0.162	0.103	0.141
4	0.234	0.115	0.176
5	0.324	0.142	0.217
Simulat	ed Fault Test: 120 VAC - Equipotenti	al Voltage Measurements (Water-to-De	ck) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.128	0.069	0.116
2	0.218	0.084	0.138
3	0.314	0.104	0.168
4	0.399	0.143	0.229
5	0.446	0.193	0.260
	Final Observ	ations & Sign-Off	
	12' x 28' pool - Weather: 84 F, 51% hum wire at pump to remote earth rod	idity at time of test (10:00 AM) - Voltage tes	t done connected from main bonding
Observations			
Observations			
Observations Test Completed by:			
Test Completed by:	Kristoffer Costa	Name	John Antonelli
Test Completed by: Name:	Kristoffer Costa EMC Technician - IIA		John Antonelli VP - SunSmart Engineering
Test Completed by: Name: Title: Signature:	EMC Technician - IIA	Title: Signature:	VP - SunSmart Engineering
Test Completed by: Name: Title:	EMC Technician - IIA	Title	VP - SunSmart Engineering



#### 8.3.2 Test Data, Pool #2, 667 Linville Falls Dr. W. Melbourne, FL

	Pool Bon	ding & Equip	otential Voltage Tes	st Form		
		POOLIN	FORMATION			
Pool ID	Test Pool #2					
	667 Linville Falls Dr,	West Melbourn	e, FL 32904			
ol Type (Concrete/Fiberglass/Vinyl						
ding Type (Wire Loop/Copper Grid)	Copper Grid					
	4/8/2025 & 4/16/202					
Tested By	Kristoffer Costa (IIA)	, John Antonelli	(SunSmart Engineering)			
Witnessed By	Albert Underwood, D	ustin Underwoo	od (Aqua Blue Pools)			
			UITY TESTING			
Location	1	TO REMOTE E	ARTH GROUND ROD		3	
Description						
Bonding to Earth Ground (Ω)						
		TO EQUIP	MENT GROUND			
Location	1		2		3	
Description	Pump Lug to	Pool Panel	Lighting Transform	ner to Pool Panel	Lighting J-box to	Pool Panel
Bonding to Equip. Ground (Ω)	) 0.1	l	0.1	L,	0.1	
	<u> </u>					
			200 Ω Re			istor
Distance from Water (ft) 1	Open C 0.00		200 Ω Re 0.00		500 Ω Res 0.004	
2	0.00		0.00		0.005	
3	0.00		0.00		0.006	
4	0.00		0.00		0.004	
5	0.00	)9	0.00	)4	0.004	
	1 · · · · · · · · · · · · · · · · · · ·	-	ts - POOL EQUIPMENT			
Distance from Water (ft) 1	Open Circuit - 4/8 0.007	4/16 0.011	200 Ω Resistor-4/8 0.007	4/16 0.005	500 Ω Resistor-4/8 0.003	4/16 0.003
2	0.007	0.009	0.007	0.005	0.004	0.005
3	0.005	0.01	0.007	0.008	0.004	0.009
4	0.007	0.009	0.005	0.009	0.004	0.001
5	0.006	0.01	0.006	0.009	0.004	0.009
Simula	ted Fault Test: 60 VA	C - Equipotenti	al Voltage Measureme	nts (Water-to-De	ck) - VAC	
Distance from Water (ft)	Open C	ircuit	200 Ω Re	esistor	500 Ω Res	istor
1	0.01	11	0.00	)5	0.002	1
2	0.00	)9	0.00	)5	0.007	,
3	0.00		0.00		0.008	
4	0.0		0.00		0.01	
5	0.0	1	0.00	)5	0.006	•
Simula	ted Fault Test: 90 VA	C - Equinatenti	al Voltage Measuremer	nts (Water-to-De	ck) - VAC	
Distance from Water (ft)	Open C		200 Ω Re		500 Ω Res	istor
1	0.0		0.00		0.003	
2	0.01	11	0.00	)8	0.003	1
3	0.0	1	0.00	06	0.004	<u>ــــــــــــــــــــــــــــــــــــ</u>
4	0.01		0.00		0.005	
5	0.0	1	0.00	)5	0.005	
			ial Voltage Measureme			
Distance from Water (ft)	Open C		200 Ω Re		500 Ω Res	
2	0.01		0.00		0.006	
3	0.00		0.00		0.005	
4	0.00		0.00		0.005	
5	0.00		0.00		0.006	
		<b>Final Observ</b>	ations & Sign-Off			
Observations			ain prior to test, gorund w faul testing. Reschedulin			
Test Completed by:						
	: Kristoffer Costa	* 	`	Name	: John Antonelli	
	EMC Technician - IIA			Title		ering
Signature	:			Signature	:	
Date	:			Date	:	



#### 8.3.3 Test Data, Pool #3a, 1906 Summerfield Road Winter Park, FL

	Pool Bonding & Equi	potential Voltage Test Form	
	POOL	INFORMATION	
Pool ID	Test Pool #3		
	1906 Summerfield Rd, Winter Park,	FL 32792	
l Type (Concrete/Fiberglass/Vinyl)			
ing Type (Wire Loop/Copper Grid)			
Date of Test	4/9/2025		
Tested By	Kristoffer Costa (IIA), John Antonel	li (SunSmart Engineering)	
Witnessed By	Brad Quehl (Holland Pools), Richar	d Smith (SunSmart Engineering)	
	CONTI	NUITY TESTING	
		EARTH GROUND ROD	
Location	1	2	3
Description	I		
Bonding to Earth Ground (Ω)			
	TO EQUI	PMENT GROUND	
Location		2	3
Description	Pump Lug to Pool Panel	Lighting Transformer to Pool Panel	Lighting J-box to Pool Panel
Bonding to Equip. Ground (Ω)	0.2	0.2	0.3
		ents - POOL EQUIPMENT ON (Water-to-De	
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.005	0.002	0.002
2	0.005	0.003	0.002
3	0.005	0.002	0.002
4	0.005	0.002	0.002
5	0.005	0.002	0.004
Baseline Distance from Water (ft)	Equipotential Voltage Measureme Open Circuit	ents - POOL EQUIPMENT OFF (Water-to-Do 200 Ω Resistor	eck) - VAC 500 Ω Resistor
1	0.005	0.005	0.001
2	0.005	0.003	0.002
3	0.005	0.002	0.002
4	0.005	0.002	0.002
5	0.006		
		0.001	
	0.000	0.001	0.002
Cimula:			
	ted Fault Test: 60 VAC - Equipoten	tial Voltage Measurements (Water-to-Dec	k) - VAC
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor	k) - VAC 500 Ω Resistor
Distance from Water (ft) 1	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212	k) - VAC 500 Ω Resistor 0.045
Distance from Water (ft) 1 2	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259	k) - VAC 500 Ω Resistor 0.045 0.163
Distance from Water (ft) 1 2 3	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289	k) - VAC 500 Ω Resistor 0.045 0.163 0.331
Distance from Water (ft) 1 2 3 4	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562	tial Voltage Measurements (Water-to-Dec 200 C Resistor 0.212 0.259 0.289 0.481	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463
Distance from Water (ft) 1 2 3	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289	k) - VAC 500 Ω Resistor 0.045 0.163 0.331
Distance from Water (ft)  1  2  3  4  5	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289 0.481 0.235	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772
Distance from Water (ft)  1  2  3  4  5  Simulat	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289 0.481 0.235 tial Voltage Measurements (Water-to-Dec	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289 0.481 0.235 tial Voltage Measurements (Water-to-Dec 200 Ω Resistor	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072	tial Voltage Measurements (Water-to-Dec 200 G Resistor 0.212 0.259 0.289 0.481 0.235 tial Voltage Measurements (Water-to-Dec 200 G Resistor 0.255	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289 0.481 0.235 1000 Ω Resistor 200 Ω Resistor 0.255 0.328	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289 0.481 0.235 tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.255 0.328 1.456	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289 0.481 0.235 141 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.255 0.328 1.456 1.601	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289 0.481 0.235 tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.255 0.328 1.456	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436
Distance from Water (ft)  1  2  3  4  5  Uistance from Water (ft)  1  2  3  4  4  5  5  5  5  1  1  2  3  4  4  5  5  5  5  5  5  5  5  5  5  5	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84	tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.212 0.259 0.289 0.481 0.235 tial Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.255 0.328 1.456 1.601 2.983	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135 1.746
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ed Fault Test: 90 VAC - Equipoten 0pen Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter	tial Voltage Measurements (Water-to-Dec 200 G Resistor 0.212 0.259 0.289 0.481 0.235 tial Voltage Measurements (Water-to-Dec 200 G Resistor 0.255 0.328 1.456 1.601 2.983	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135 1.746 ck) - VAC
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten 0pen Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoten Open Circuit	Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           100 Ω Resistor           200 Ω Resistor           0.255           0.328           1.456           1.601           2.983           141 Voltage Measurements (Water-to-Dec	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135 1.746 ck) - VAC 500 Ω Resistor
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoten Open Circuit 1.818	Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           1           200 Ω Resistor           0.255           0.235           1           0.255           0.328           1.456           1.601           2.983           1.456           1.601           2.983           0.312	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135 1.746 k) - VAC 500 Ω Resistor 0.463 0.772 0.144 0.436 1.135 1.746 0.465 0.045
Distance from Water (ft)           1           2           3           4           5           Simulat           Distance from Water (ft)           1           2           3           4           5           Simulat           Distance from Water (ft)           1           2           3           4           5           Simulat           Distance from Water (ft)           1           2	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter Open Circuit 1.818 2.217	Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           10.235           10.24           0.259           0.259           0.289           0.481           0.235           10.235           10.235           10.235           10.235           1.456           1.601           2.983           1tial Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.312           0.476	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135 1.746 ck) - VAC 500 Ω Resistor 0.045 0.045 0.115
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter Open Circuit 1.818 2.217 2.856	Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.255           0.255           0.328           1.456           1.601           2.983           1tial Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.312           0.476           0.958	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135 1.746 ck) - VAC 500 Ω Resistor 0.045 0.045 0.115 0.276
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten 0pen Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter Open Circuit 1.818 2.217 2.856 9.170	200 G Resistor           0.212           0.259           0.289           0.481           0.235           0.235           0.210           0.289           0.481           0.235           0.255           0.255           0.328           1.456           1.601           2.983           1.456           0.312           0.312           0.312           0.476           0.958           1.976	k) - VAC           500 Ω Resistor           0.045           0.163           0.331           0.463           0.772           b           500 Ω Resistor           0.112           0.144           0.436           1.135           1.746           ck) - VAC           500 Ω Resistor           0.045           0.115           0.276           0.712
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter Open Circuit 1.818 2.217 2.856	Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.255           0.255           0.328           1.456           1.601           2.983           1tial Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.312           0.476           0.958	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135 1.746 ck) - VAC 500 Ω Resistor 0.045 0.045 0.115 0.276
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter Open Circuit 1.818 2.217 2.856 9.170 13.840	200 Ω Resistor           0.212           0.259           0.259           0.289           0.481           0.235           0           0.235           0.289           0.481           0.235           0.235           0.328           1.456           1.601           2.983           0.1456           1.601           2.983           0.312           0.312           0.312           0.312           0.312           0.358           1.976           3.664	k) - VAC           500 Ω Resistor           0.045           0.163           0.331           0.463           0.772           b           500 Ω Resistor           0.112           0.144           0.436           1.135           1.746           ck) - VAC           500 Ω Resistor           0.045           0.115           0.276           0.712
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter Open Circuit 1.818 2.217 2.856 9.170 13.840 Final Obser 14' x 22' pool - Weather: 65 F, 70% hu	200 G Resistor           0.212           0.259           0.289           0.481           0.235           0.235           0.210           0.289           0.481           0.235           0.255           0.255           0.328           1.456           1.601           2.983           1.456           0.312           0.312           0.312           0.476           0.958           1.976	k) - VAC           500 Ω Resistor           0.045           0.163           0.331           0.463           0.772           b           500 Ω Resistor           0.112           0.144           0.436           1.135           1.746           ck) - VAC           500 Ω Resistor           0.045           0.112           0.144           0.436           1.135           1.746           0.045           0.115           0.276           0.712           0.834           a           a
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter Open Circuit 1.818 2.217 2.856 9.170 13.840 Final Obser 14' x 22' pool - Weather: 65 F, 70% hu	Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           0.235           0.235           0.235           0.255           0.255           0.328           1.456           1.601           2.983           0.312           0.312           0.476           0.958           1.976           3.664           vations & Sign-Off           midity at time of test (10:00 AM) - Voltage tes	k) - VAC           500 Ω Resistor           0.045           0.163           0.331           0.463           0.772           b           500 Ω Resistor           0.112           0.144           0.436           1.135           1.746           ck) - VAC           500 Ω Resistor           0.045           0.112           0.144           0.436           1.135           1.746           0.045           0.115           0.276           0.712           0.834           a           a
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter Open Circuit 1.818 2.217 2.856 9.170 13.840 Final Obser 14' x 22' pool - Weather: 65 F, 70% hu	Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           0.235           0.235           0.235           0.255           0.255           0.328           1.456           1.601           2.983           0.312           0.312           0.476           0.958           1.976           3.664           vations & Sign-Off           midity at time of test (10:00 AM) - Voltage tes	k) - VAC           500 Ω Resistor           0.045           0.163           0.331           0.463           0.772           b           500 Ω Resistor           0.112           0.144           0.436           1.135           1.746           ck) - VAC           500 Ω Resistor           0.045           0.112           0.144           0.436           1.135           1.746           0.045           0.115           0.276           0.712           0.834           a           a
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoten Open Circuit 1.818 2.217 2.856 9.170 13.840 Final Obset 14' x 22' pool - Weather: 65 F, 70% hu wire at pump to remote earth rod - P	200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.235           0.328           1.456           1.601           2.983           utial Voltage Measurements (Water-to-De           200 Ω Resistor           0.312           0.476           0.958           1.976           3.664           vations & Sign-Off           midity at time of test (10:00 AM) - Voltage test ower source for VARIAC was from non-GFCI ower sowere source for VARIAC was from non-GFCI ower source for VARIAC w	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135 1.746 ck) - VAC 500 Ω Resistor 0.045 0.115 0.276 0.712 0.834 ck and connected from main bonding atlet in home
Distance from Water (ft)           1           2           3           4           5           Simulal           Distance from Water (ft)           1           2           3           4           5           Simulat           Distance from Water (ft)           1           2           3           4           5           0           2           3           4           5           0           0bservations           Test Completed by:           Name:	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoter Open Circuit 1.818 2.217 2.856 9.170 13.840 Final Obsec Final Obsec Final Obsec SF, 70% hu wire at pump to remote earth rod - P	Lial Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           0.235           10.235           10.235           10.235           10.235           11.00           200 Ω Resistor           0.255           0.328           1.456           1.601           2.983           1.456           1.601           2.983           1.456           1.601           2.983           1.456           1.601           2.983           1.456           1.601           2.983           1.976           3.664           Vations & Sign-Off           midity at time of test (10:00 AM) - Voltage test ower source for VARIAC was from non-GFCI or           VARIAC was from non-GFCI or           Name:	SOO Ω Resistor           0.045           0.163           0.331           0.463           0.772           x) - VAC           500 Ω Resistor           0.112           0.144           0.436           1.135           1.746           ck) - VAC           500 Ω Resistor           0.4436           1.135           1.746           0.045           0.045           0.115           0.276           0.712           0.834           t done connected from main bonding tilet in home           John Antonelli
Distance from Water (ft)	ted Fault Test: 60 VAC - Equipoten Open Circuit 0.368 0.829 2.568 3.562 6.81 ted Fault Test: 90 VAC - Equipoten Open Circuit 1.072 0.909 4.33 7.84 9.67 ed Fault Test: 120 VAC - Equipoten Open Circuit 1.818 2.217 2.856 9.170 13.840 Final Obser 14' x 22' pool - Weather: 65 F, 70% hu wire at pump to remote earth rod - P Kristoffer Costa EMC Technician - IIA	Lial Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.212           0.259           0.289           0.481           0.235           0.328           1.456           1.601           2.983           1.456           1.601           2.983           1.456           1.601           2.983           4.456           1.601           2.983           4.456           1.601           2.983           4.456           1.601           2.983           4.476           0.312           0.476           0.358           1.976           3.664           Vations & Sign-Off           midity at time of test (10:00 AM) - Voltage test ower source for VARIAC was from non-GFCI or           Name:           Name:	k) - VAC 500 Ω Resistor 0.045 0.163 0.331 0.463 0.772 (k) - VAC 500 Ω Resistor 0.112 0.144 0.436 1.135 1.746 (ck) - VAC 500 Ω Resistor 0.045 0.115 0.276 0.712 0.834 (ck) - VAC 0.834 (ck) - VAC 0.976 0.712 0.834 (ck) - VAC 0.976 0.712 0.834 (ck) - VAC 0.976 0.712 0.834 (ck) - VAC 0.976 0.712 0.834 (ck) - VAC 0.976 0.772 0.976 0.772 0.976 0.772 0.976 0.9772 0.976 0.9772 0.9772 0.9772 0.9776 0.9772 0.97772 0.9772 0.97772 0.97772 0.9772 0.97772 0.97772 0.9



#### 8.3.4 Test Data, Pool #3b, RECHECK, 1906 Summerfield Road Winter Park, FL

	Pool Bonding & Equip	otential voltage lest Form	
	POOL IN	IFORMATION	
Pool IC	Test Pool #3		
	1906 Summerfield Rd, Winter Park, F	L 32792	
Type (Concrete/Fiberglass/Vinyl			
ng Type (Wire Loop/Copper Grid)	Copper Grid		
Date of Test	4/16/2025 - RE-CHECK		
Tested By	Kristoffer Costa (IIA), John Antonelli	(SunSmart Engineering)	
Witnessed P	(Bisbard Messley (Helland Beels)		
witnessed by	Richard Moseley (Holland Pools)		
	CONTIN	UITY TESTING	
	TO REMOTE EA	ARTH GROUND ROD	
Location	1 1	2	3
Description	n		
Bonding to Earth Ground (Ω)	)		
	TO EQUIPI	MENT GROUND	
Location	1 1	2	3
Description	<ul> <li>Pump Lug to Pool Panel</li> </ul>	Lighting Transformer to Pool Panel	Lighting J-box to Pool Panel
Bonding to Equip. Ground (Ω)	)		
Baseline	Equipotential Voltage Measuremen	ts - POOL EQUIPMENT ON (Water-to-De	eck) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1			
2			
3			
4			
5			
Baseline	Equipotential Voltage Measuremen	ts - POOL EQUIPMENT OFF (Water-to-D	eck) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.008	0.006	0.006
2	0.008	0.006	0.007
3	0.008	0.006	0.008
4	0.008	0.007	0.006
5	0.008	0.007	0.006
Simula	And Freik Trets CO MAG. Freihartent	· · · · · · · · · · · · · · · · · · ·	
	ited Fault Test: 60 VAC - Equipotentia	al Voltage Measurements (Water-to-Dec	ck) - VAC
Distance from Water (ft)	Open Circuit	al Voltage Measurements (Water-to-Dec 200 Ω Resistor	ck) - VAC 500 Ω Resistor
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
Distance from Water (ft) 1	Open Circuit 0.007	200 Ω Resistor 0.01	500 Ω Resistor 0.004
Distance from Water (ft) 1 2	Open Circuit 0.007 0.012	200 Ω Resistor 0.01 0.015	500 Ω Resistor 0.004 0.005
Distance from Water (ft) 1 2 3	Open Circuit 0.007 0.012 0.013	200 Ω Resistor 0.01 0.015 0.009	500 Ω Resistor 0.004 0.005 0.006
Distance from Water (ft) 1 2 3 4	Open Circuit 0.007 0.012 0.013 0.014	200 Ω Resistor 0.01 0.015 0.009 0.008	500 Ω Resistor 0.004 0.005 0.006 0.006
Distance from Water (ft) 1 2 3 4 5	Open Circuit 0.007 0.012 0.013 0.014 0.02	200 Ω Resistor 0.01 0.015 0.009 0.008	500 Ω Resistor 0.004 0.005 0.006 0.006 0.006 0.007
Distance from Water (ft) 1 2 3 4 5	Open Circuit 0.007 0.012 0.013 0.014 0.02	200 Ω Resistor 0.01 0.015 0.009 0.008 0.009	500 Ω Resistor 0.004 0.005 0.006 0.006 0.006 0.007
Distance from Water (ft)  1  2  3  4  5  Simula	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotentia	200 Ω Resistor 0.01 0.015 0.009 0.008 0.009 al Voltage Measurements (Water-to-Dec	500 Ω Resistor 0.004 0.005 0.006 0.006 0.007 k) - VAC
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti Open Circuit	200 Ω Resistor 0.01 0.015 0.009 0.008 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.001 0.015 0.015 0.015 0.009	500 Ω Resistor 0.004 0.005 0.006 0.006 0.007 
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotentia Open Circuit 0.01	200 Ω Resistor 0.01 0.015 0.009 0.008 0.009	500 Ω Resistor 0.004 0.005 0.006 0.006 0.007 k) - VAC 500 Ω Resistor 0.004
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti Open Circuit 0.01 0.01	200 Ω Resistor 0.01 0.015 0.009 0.008 0.009 al Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.008 0.008	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti Open Circuit 0.01 0.011 0.011 0.012	200 Ω Resistor           0.01         0.015           0.009         0.008           0.009         0.008           al Voltage Measurements (Water-to-Decord 200 Ω Resistor         0.008           0.008         0.008           0.008         0.008           0.008         0.008           0.008         0.008           0.008         0.006           0.009         0.009	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007           k) - VAC           500 Ω Resistor           0.004           0.004           0.004
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti Open Circuit 0.01 0.011 0.012 0.02	200 Ω Resistor           0.01           0.015           0.009           0.008           0.009           10012 (Mathematic Mathematic Mathmate Mathematic Mathmate	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007           k) - VAC           500 Ω Resistor           0.004           0.004           0.004           0.004           0.004           0.004           0.004
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti Open Circuit 0.01 0.011 0.011 0.012 0.02 0.032 0.032	200 Ω Resistor           0.01           0.015           0.009           0.008           0.009           10012 (Mathematic Mathematic Mathmate Mathematic Mathmate	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti Open Circuit 0.01 0.011 0.011 0.012 0.02 0.032 0.032	200 Ω Resistor           0.01         0.015           0.009         0.009           0.009         0.008           0.009         0.008           0.0009         0.008           0.000         0.008           0.008         0.008           0.008         0.008           0.008         0.008           0.009         0.007           0.007         0.007	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007
Distance from Water (ft)	Open Circuit           0.007           0.012           0.013           0.014           0.02           ted Fault Test: 90 VAC - Equipotenti           0.01           0.01           0.01           0.01           0.01           0.01           0.01           0.01           0.02           0.032           0.032           ted Fault Test: 120 VAC - Equipotenti           Open Circuit	200 Ω Resistor           0.01           0.015           0.009           0.008           0.009           al Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.006           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007           x) - VAC           500 Ω Resistor           0.004           0.004           0.004           0.004           0.004           0.004           0.004           0.005           0.003           0.003           ck) - VAC           500 Ω Resistor
Distance from Water (ft)           1           2           3           4           5           Jistance from Water (ft)           1           2           3           4           5           Simulat           Distance from Water (ft)           1           2           3           4           5           Simulat           Distance from Water (ft)           1	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti Open Circuit 0.01 0.011 0.011 0.012 0.02 0.02 0.032 ted Fault Test: 120 VAC - Equipotenti Open Circuit 0.013	200 Ω Resistor           0.01           0.015           0.009           0.009           0.009           0.009           0.008           0.009           0.009           0.008           0.009           0.008           0.009           0.008           0.008           0.006           0.006           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007           k) - VAC           500 Ω Resistor           0.004           0.004           0.004           0.004           0.004           0.004           0.003           0.005           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 contract setup: test 90 VAC - Equipotenti 0.01 0.011 0.011 0.012 0.02 0.032 contract setup: 120 VAC - Equipotenti Open Circuit Open Circuit 0.013 0.013 0.013 0.018	200 Ω Resistor           0.01         0.015           0.005         0.009           0.008         0.009           al Voltage Measurements (Water-to-Dec         200 Ω Resistor           0.006         0.006           0.009         0.006           0.006         0.007           0.007         0.007           0.007         0.007           0.007         0.007           0.013         0.007	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007           x) - VAC           500 Ω Resistor           0.004           0.004           0.004           0.004           0.004           0.004           0.004           0.005           0.003           0.003           ck) - VAC           500 Ω Resistor
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti 0.01 0.011 0.011 0.012 0.02 0.032 ted Fault Test: 120 VAC - Equipotenti Open Circuit 0.013 0.013 0.018 0.018	200 Ω Resistor           0.01         0.015           0.009         0.008           0.009         0.008           0.009         0.008           0.009         0.008           0.0009         0.008           0.000         0.006           0.006         0.006           0.007         0.007           0.013         0.007	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007
Distance from Water (ft)	Open Circuit           0.007           0.012           0.013           0.014           0.02           ted Fault Test: 90 VAC - Equipotenti           0.01           0.01           0.01           0.01           0.01           0.01           0.01           0.01           0.012           0.02           0.032           ted Fault Test: 120 VAC - Equipotenti           Open Circuit           0.013           0.018           0.018           0.026	200 Ω Resistor           0.01         0.015           0.009         0.008           0.009         0.008           al Voltage Measurements (Water-to-Dec         200 Ω Resistor           0.008         0.006           0.009         0.007           0.007         0.007           0.0013         0.013           0.002         0.007	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007           0.007           (k) - VAC           500 Ω Resistor           0.004           0.004           0.004           0.004           0.003           0.005           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.004
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti 0.01 0.011 0.011 0.012 0.02 0.032 ted Fault Test: 120 VAC - Equipotenti Open Circuit 0.013 0.013 0.018 0.018	200 Ω Resistor           0.01         0.015           0.009         0.008           0.009         0.008           0.009         0.008           0.009         0.008           0.0009         0.008           0.000         0.006           0.006         0.006           0.007         0.007           0.013         0.007	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 inted Fault Test: 90 VAC - Equipotenti 0.01 0.011 0.011 0.012 0.02 0.032 ited Fault Test: 120 VAC - Equipotenti Open Circuit 0.013 0.018 0.018 0.018 0.026 0.042	200 Ω Resistor           0.01           0.015           0.009           0.009           0.009           0.009           0.008           0.009           0.009           0.008           0.009           0.009           0.009           0.001           0.002           0.003           0.006           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.013           0.006           0.020           0.016	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007           0.007           (k) - VAC           500 Ω Resistor           0.004           0.004           0.004           0.004           0.003           0.005           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.003           0.004
Distance from Water (ft)	Open Circuit 0.007 0.012 0.013 0.014 0.02 ted Fault Test: 90 VAC - Equipotenti Open Circuit 0.01 0.011 0.012 0.02 0.032 0.032 10 VAC - Equipotenti 0.012 0.02 0.032 0.032 0.032 0.032 0.033 0.013 0.018 0.018 0.018 0.026 0.042 Final Observ 14' x 22' pool - Weather: 76 F, 30% hum	200 Ω Resistor           0.01           0.015           0.009           0.009           0.009           0.009           0.009           0.009           0.009           0.008           0.009           0.008           0.009           0.008           0.008           0.008           0.006           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.013           0.006           0.020           0.016           ations & Sign-Off           idity at time of test (12:00 PM) - Voltage test           CHECK DUE TO ANOMALOUS VALUES FROM	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007
Distance from Water (ft)	Open Circuit           0.007           0.012           0.013           0.014           0.02           ited Fault Test: 90 VAC - Equipotenti           0.011           0.012           0.013           0.014           0.02           0.01           0.01           0.011           0.012           0.02           0.032           0.032           0.032           0.032           0.033           0.013           0.018           0.026           0.042           Final Observ           14' x 22' pool - Weather: 76 F, 30% hum wire at pump to remote earth rod - RE	200 Ω Resistor           0.01           0.015           0.009           0.009           0.009           0.009           0.009           0.009           0.009           0.008           0.009           0.008           0.009           0.008           0.008           0.008           0.006           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.013           0.006           0.020           0.016           ations & Sign-Off           idity at time of test (12:00 PM) - Voltage test           CHECK DUE TO ANOMALOUS VALUES FROM	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007
Distance from Water (ft)	Open Circuit           0.007           0.012           0.013           0.014           0.02           ited Fault Test: 90 VAC - Equipotenti           0.011           0.012           0.013           0.014           0.02           0.01           0.01           0.011           0.012           0.02           0.032           0.032           0.032           0.032           0.033           0.013           0.018           0.026           0.042           Final Observ           14' x 22' pool - Weather: 76 F, 30% hum wire at pump to remote earth rod - RE	200 Ω Resistor           0.01           0.015           0.009           0.009           0.009           0.009           0.009           0.009           0.009           0.008           0.009           0.008           0.009           0.008           0.008           0.008           0.006           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.013           0.006           0.020           0.016           ations & Sign-Off           idity at time of test (12:00 PM) - Voltage test           CHECK DUE TO ANOMALOUS VALUES FROM	500 Ω Resistor           0.004           0.005           0.006           0.006           0.007
Distance from Water (ft)           1           2           3           4           5           Jistance from Water (ft)           1           2           3           4           5           Jistance from Water (ft)           1           2           3           4           5           Jistance from Water (ft)           1           2           3           4           5           Jistance from Water (ft)           1           2           3           4           5           Observations           Test Completed by:	Open Circuit           0.007           0.012           0.013           0.014           0.02           ited Fault Test: 90 VAC - Equipotenti           0.011           0.012           0.013           0.014           0.02           0.01           0.01           0.011           0.012           0.02           0.032           0.032           0.032           0.032           0.032           0.032           0.032           0.032           0.033           0.018           0.026           0.042           Final Observ           VARIAC was from portable battery pov	200 Ω Resistor           0.01           0.015           0.009           0.009           0.009           0.009           0.009           0.009           0.009           0.008           0.009           0.009           0.009           0.009           0.009           0.009           0.008           0.006           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.006           0.020           0.016           ations & Sign-Off           idity at time of test (12:00 PM) - Voltage test           CHECK DUE TO ANOMALOUS VALUES FROM           ver supply	500 Ω Resistor           0.004           0.005           0.006           0.006           0.006           0.006           0.006           0.007
Distance from Water (ft)           1           2           3           4           5           Simula           1           2           3           4           5           Simula           Distance from Water (ft)           1           2           3           4           5           Simulat           Distance from Water (ft)           1           2           3           4           5           0bservations           Observations           Test Completed by:           Name	Open Circuit           0.007           0.012           0.013           0.014           0.02           ted Fault Test: 90 VAC - Equipotenti           Open Circuit           0.01           0.011           0.012           0.01           0.011           0.012           0.02           0.032           ced Fault Test: 120 VAC - Equipotenti           Open Circuit           0.013           0.018           0.018           0.026           0.042           Final Observ           YARIAC was from portable battery pov           Kristoffer Costa	200 Ω Resistor           0.01           0.015           0.009           0.009           0.009           0.009           0.009           0.009           0.009           0.008           0.009           al Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.006           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.006           0.007           0.006           0.007           0.016           ations & Sign-Off           didty attime of test (12:00 PM) - Voltage test           CHECK DUE TO ANOMALOUS VALUES FROM*           ver supply           Ver supply	500 Ω Resistor           0.004           0.005           0.006           0.006           0.006           0.006           0.006           0.006           0.006           0.007           k) - VAC           500 Ω Resistor           0.003           0.005           0.003           0.005           0.005           0.009           0.010           0.009           0.005           0.004           0.009           0.005           0.004           0.009           0.009           0.004           connected from main bonding           EtSTING ON 4/9 Power source for           John Antonelli
Distance from Water (ft)           1           2           3           4           5           Simula           1           2           3           4           5           Simula           Distance from Water (ft)           1           2           3           4           5           Simulat           Distance from Water (ft)           1           2           3           4           5           0bservations           Observations           Test Completed by:           Name	Open Circuit           0.007           0.012           0.013           0.014           0.02           ted Fault Test: 90 VAC - Equipotenti           0pen Circuit           0.01           0.01           0.01           0.01           0.01           0.01           0.01           0.01           0.01           0.012           0.02           0.032           0.032           0.032           0.032           0.013           0.018           0.018           0.026           0.042           Final Observ           14' x 22' pool - Weather: 76 F, 30% hum wire at pump to remote earth rod - RE: VARIAC was from portable battery pov           L4' x 22' pool - Weather: 76 F, 30% hum wire at pump to remote earth rod - RE: VARIAC was from portable battery pov           kristoffer Costa           EMC Technician - IIA	200 Ω Resistor           0.01           0.015           0.009           0.009           0.009           0.009           0.009           0.009           0.009           0.008           0.009           al Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.006           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.007           0.006           0.007           0.016           ations & Sign-Off           didty at time of test (12:00 PM) - Voltage test           CHECK DUE TO ANOMALOUS VALUES FROM*           ver supply           Values FROM*	500 Ω Resistor           0.004           0.005           0.006           0.006           0.006           0.006           0.006           0.007

Page 16 of 25



#### 8.3.5 Test Data, Pool #4, 17909 Lookout Hill Rd, Winter Garden, FL

Pool Proto #           Decimal protocolspan="2">Decimal protocolspan= 2"Decimal protocolspan="2">Decimal protocolspan="2"D		Pool Bon	ding & Equipor	tential Voltage Tes	t Form			
Peol D         Part Doug 4           Locatina 1/20 (costant HII 66, Vincer Carrier, FL 3/37								
Locolio 1202 Lockick Hill A, Windr Garden, F. 12927 Hig Closer CHR (1997) Set 1997 (1997) Se	Bool IF	Task Dask #4	POOL INF	ORMATION				
ling i Concret / Heap i			d Winter Cardon	EI 24797				
ing Type (Wite Loop/Cooper Gifs) is inter loading, water band plate in skimmer Description of the intervence of the in				, FL 34767				
Dete of Testid P (Xin Stander Costa) (AL) John Antonelli Ejustimant Engineering)           Witnessed Pay Michael Rame (Mud River Proto)           CONTINUITY TSTING           Detecting town colspan="2">Detecting town colspan="2">				kimmer				
Tested by instant Graph Reprint Equinating)           United Rame (Mod River Pools)           CONTINUET VESTING           CONTINUET VESTING           CONTINUET VESTING           Continue Vesting Reprint R				-				
CONTINUITY TESTING           TO REMOTE RATH GROUND ROD           Location         1         2         3           Bonding to Earth Ground (0)				unSmart Engineering)				
CONTINUITY TESTING           TO REMOTE RATH GROUPD ROD           Lecation         1         2         3           Description	Witnessed By	Michael Ramoo (Mar	Pivor Pools)					
1         2         3           Description	withessed by	Wilchael Karriee (Wac	r (iver Foois)					
TO REMOTE EARTH GROUND ROD           Joectington <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
Josefortion         Image: Control of the image: Contrest image: Control of th								
Description              Bonding to Earth Ground (D)               Location         1         Z         3             Bonding to Earth Ground (D)         0.4         0.2         0.4             Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Vater-to-leck) - VAC         Distance from Water (N)         Open Cricit         200 0 Resistor         0.043           2         0.091         0.071         0.043         0.043         0.043           3         0.089         0.067         0.036         0.044         0.055           5         0.118         0.079         0.053         0.055           5         0.128         0.0861         0.092         0.065           5         0.138         0.079         0.053         0.066           Distance from Water (R)         Open Cricit - 4/9         4/14         200 Resistor 4/9         4/14           1         0.029         0.126         0.086         0.046         0.052           2         0.130         0.155         0.056         0.026         0.023           3         0.132 <td>Lesstier</td> <td>1</td> <td>TO REMOTE EAD</td> <td></td> <td></td> <td>3</td> <td></td>	Lesstier	1	TO REMOTE EAD			3		
Bonding to Earth Ground (p)              TO EQUIPMENT GROUND           Laccation         1         2         3           Description         Punp Lug to Pool Panel         Lighting Transformer to Pool Panel         Heat Punp Lug to Pool Panel           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water to-Deck) - VAC         Soo D Resistor         Soo D Resistor           Distance from Water (ft)         0.084         0.063         0.043           3         0.089         0.067         0.036           4         0.038         0.082         0.0055           5         0.138         0.079         0.053           6         0.108         0.064         0.052         0.064           7         0.091         0.027         0.064         0.052         0.064           0         0.093         0.126         0.066         0.044         0.063         0.045         0.064           1         0.073         0.126         0.065         0.066         0.046         0.052         0.062           2         0.138         0.056         0.056         0.061         0.045         0.042         0.062 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>								
TO EQUIPMENT GROUND           Location         1         2         3           Description         Pump Ling to Pool Panel         Lighting Transformer to Pool Panel         Heat Pump Ling to Pool Panel           Bonding to Equip. Ground (2)         0.4         0.2         0.4           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC         Distance from Water (1)         Open Circuit         200 D Resistor         500 D Resistor           1         0.068         0.063         0.048         0.063         0.048           3         0.069         0.067         0.0036         0.048         0.052         0.055           5         0.118         0.079         0.053         0.065         0.065         0.062         0.065           5         0.118         0.079         0.053         0.062         0.062         0.062         0.062         0.062         0.062         0.062         0.062         0.062         0.062         0.063         0.062         0.062         0.062         0.062         0.062         0.063         0.062         0.062         0.063         0.062         0.063         0.062         0.063         0.062         0.062         0.062         0.062         0.062								
Location         1         2         3           Description         Pump Lig to Pool Panel         Lighting Transformer to Pool Panel         Heat Pump Lig to Pool Panel           Bonding to Equip. Ground (10)         0.4         0.2         0.4           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC         Distance from Water (11)         0.084         0.063         0.048           2         0.091         0.071         0.043         0.063         0.048           3         0.089         0.067         0.036         0.045           4         0.032         0.082         0.065           5         0.118         0.079         0.063           0         0.02         0.065         0.063           5         0.118         0.079         0.053           0         0.020         0.066         0.094         0.052           1         0.039         0.126         0.068         0.094         0.052           1         0.030         0.141         0.059         0.046         0.053           3         0.103         0.173         0.062         0.122         0.064           4         0.0124         0.055         0.072 <td></td> <td></td> <td>TO EQUIPM</td> <td>ENT GROUND</td> <td></td> <td></td> <td></td>			TO EQUIPM	ENT GROUND				
Bending to Equip. Ground (Ω)         0.4         0.2         0.4           Baseline Equipotential Voltage Measurements - POOL EQUPMENT ON (Water-to-Deck) - VAC           Distance from Water (It)         0.0en Circuit         200 Ω Resistor         500 Ω Resistor           3         0.099         0.067         0.048           4         0.018         0.066         0.043           5         0.118         0.071         0.005           4         0.028         0.067         0.005           5         0.118         0.079         0.053           Baseline Equipotential Voltage Measurements - POOL EQUPMENT OFF (Water-to-Deck) - VAC           Distance from Water (It)         Open Circuit - 4/9         4/14         300 Ω Resistor - 4/9         4/14           1         0.039         0.126         0.068         0.094         0.052         0.062           2         0.039         0.126         0.046         0.055         0.064         0.055           4         0.123         0.046         0.055         0.027         0.064           3         0.130         0.153         0.15         0.072         0.062           4         0.123         0.153         0.15         0.072	Location	1 1				3		
Baseline Equipotential Voltage Measurements - POOL EQUIPMENT ON (Water-to-Deck) - VAC           Distance from Water (t)         Open Grout         200 D Resistor         500 D Resistor           1         0.064         0.063         0.048           2         0.051         0.071         0.043           3         0.089         0.067         0.0056           5         0.0118         0.082         0.065           5         0.0118         0.079         0.003           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC           Distance from Water (th)         Open Groutin - 4/9         4/14         200 C Resistor-4/9         4/14           3         0.028         0.055         0.066         0.052         0.062           2         0.030         0.314         0.059         0.022         0.064         0.052           3         0.136         0.317         0.062         0.122         0.045         0.045           4         0.124         0.133         0.055         0.022         0.045         0.055           5         0.136         0.317         0.062         0.212         0.045         0.056           5         0.138	Description	Pump Lug to	Pool Panel	Lighting Transform	er to Pool Panel	Heat Pump Lug to	Pool Panel	
Distance from Water (ft)         Open Circuit         200 0 Resistor         500 0 Resistor           1         0.0684         0.063         0.048           2         0.091         0.071         0.043           3         0.089         0.067         0.036           4         0.108         0.082         0.065           5         0.118         0.079         0.033           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC           Distance from Water (ft)         Open Grauit - 4/9         4/14         200 0 Resistor - 4/9         4/14           1         0.093         0.126         0.066         0.094         0.052         0.062           2         0.109         0.141         0.059         0.099         0.027         0.0642           3         0.103         0.056         0.100         0.046         0.055           5         0.135         0.056         0.012         0.045         0.046           0         0.133         0.013         0.012         0.047         0.052           1         0.135         0.057         0.047         0.052         0.072           1         0.135         0.057	Bonding to Equip. Ground (Ω	) 0.4		0.2		0.4		
Distance from Water (ft)         Open Circuit         200 0 Resistor         500 0 Resistor           1         0.0684         0.063         0.048           2         0.091         0.071         0.043           3         0.089         0.067         0.036           4         0.108         0.082         0.065           5         0.118         0.079         0.033           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC           Distance from Water (ft)         Open Grauit - 4/9         4/14         200 0 Resistor - 4/9         4/14           1         0.093         0.126         0.066         0.094         0.052         0.062           2         0.109         0.141         0.059         0.099         0.027         0.0642           3         0.103         0.056         0.100         0.046         0.055           5         0.135         0.056         0.012         0.045         0.046           0         0.133         0.013         0.012         0.047         0.052           1         0.135         0.057         0.047         0.052         0.072           1         0.135         0.057								
1         0.084         0.053         0.048           2         0.091         0.071         0.043           3         0.089         0.067         0.056           4         0.108         0.082         0.065           5         0.118         0.079         0.053           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC           Distance from Water (h)         Open Circuit - 4/9         4/14         500 D Resistor - 4/9         4/14           1         0.093         0.126         0.0664         0.094         0.052         0.062           2         0.109         0.141         0.056         0.099         0.027         0.064           3         0.103         0.156         0.056         0.099         0.027         0.064           3         0.136         0.173         0.062         0.123         0.046         0.055           5         0.136         0.117         0.062         0.123         0.046         0.057           2         0.138         0.102         0.072         0.072         1         0.133         0.115         0.072           3         0.138         0.102         0.072		1		1	-			
2         0.091         0.071         0.043           3         0.089         0.067         0.036           4         0.108         0.062         0.065           5         0.118         0.079         0.053           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC           Distance from Water (ft)         0.098         0.025         0.062         0.062           2         0.109         0.141         0.059         0.099         0.027         0.064           3         0.103         0.056         0.102         0.045         0.063           4         0.124         0.163         0.055         0.102         0.045         0.043           5         0.136         0.173         0.0622         0.123         0.046         0.055           0         0.136         0.173         0.0622         0.123         0.046         0.057           1         0.153         0.115         0.072         0.072         0.033         0.033         0.115         0.072         0.047         5         0.055         0.072         0.072         0.072         0.072         0.047         5         0.055         0.072								
3         0.089         0.067         0.036           4         0.108         0.062         0.065           5         0.118         0.079         0.053           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OF (Water-to-Deck) - VAC           Distance from Water (ft)         Open Gravit - 4/9         4/14         200 G Resistor-4/9         4/14         S00 G Resistor-4/9         4/14           1         0.093         0.126         0.068         0.094         0.0652         0.062           2         0.109         0.141         0.056         0.096         0.046         0.055           3         0.133         0.156         0.056         0.095         0.046         0.055           4         0.133         0.155         0.012         0.045         0.045           5         0.136         0.173         0.062         0.123         0.046         0.057           6         0.138         0.115         0.072         2         0.138         0.106         0.037           4         0.151         0.097         0.047         0.047         0.047         0.047           5         0.155         0.095         0.072         0.047								
4         0.108         0.082         0.065           5         0.118         0.079         0.053           Baseline Equipotential Voltage Measurements - PODL EQUIPMENT OFF (Water-to-Deck) - VAC           Distance from Water (ft)         Open Gracut - 4/9         4/14         500 Resistor-4/9         4/14           1         0.093         0.126         0.068         0.094         0.052         0.062           2         0.109         0.141         0.059         0.099         0.027         0.064           3         0.013         0.156         0.056         0.046         0.055           4         0.124         0.163         0.056         0.122         0.045         0.046           Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC         Distance from Water (ft)         Open Circuit         200 Resistor         500 Resistor           1         0.153         0.115         0.072         0.073         3         0.0138         0.1102         0.073           3         0.138         0.1102         0.073         0.047         0.055         0.072         0.047           5         0.155         0.095         0.072         0.047         0.047         0.047 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
5         0.118         0.079         0.053           Baseline Equipotential Voltage Measurements - POOL EQUIPMENT OFF (Water-to-Deck) - VAC         7414         500 O Resistor-4/9         4/14           1         0.093         0.126         0.068         0.094         0.052         0.062           2         0.109         0.141         0.059         0.094         0.052         0.062           3         0.103         0.156         0.066         0.094         0.057         0.046           3         0.103         0.156         0.056         0.046         0.053           4         0.124         0.163         0.062         0.123         0.046         0.056           5         0.136         0.173         0.062         0.123         0.046         0.057           1         0.136         0.173         0.062         0.123         0.046         0.057           1         0.133         0.115         0.077         0.047         1         0.072         0.047           2         0.138         0.102         0.047         0.072         0.047         0.072         0.047         0.072           2         0.138         0.102         0.072 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>								
Baseline Equipotential Voltage Measurements > POOL EQUIPMENT OFF (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit - 4/9         4/14         200 Resistor - 4/9         4/14         500 Resistor - 4/9         4/14           1         0.093         0.126         0.068         0.094         0.052         0.062           2         0.103         0.156         0.056         0.096         0.044         0.052         0.062           3         0.103         0.156         0.056         0.096         0.045         0.046         0.053           4         0.124         0.163         0.056         0.102         0.045         0.045           5         0.135         0.173         0.062         0.122         0.045         0.045           5         0.138         0.116         0.022         0.072         2         0.138         0.102         0.047           6         0.151         0.055         0.072         0.047         5         0.015         0.067           6         0.151         0.057         0.047         0.047         0.047         0.047           6         0.0151         0.037         0.047         0.016         0.072         0.047								
Distance from Water (ft)         Open Grcuit - 4/9         4/14         200 Ω Resistor-4/9         4/14         500 Ω Resistor-4/9         4/14           1         0.093         0.126         0.068         0.094         0.052         0.062           2         0.109         0.141         0.059         0.099         0.027         0.064           3         0.103         0.156         0.056         0.099         0.027         0.064           4         0.124         0.163         0.056         0.022         0.046         0.055           5         0.136         0.173         0.062         0.123         0.046         0.056           Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water to-Deck) - VAC           Distance from Water (ft)         Open Grcuit         200 Ω Resistor         500 Ω Resistor           1         0.153         0.115         0.072         0.047           5         0.155         0.097         0.047         0.072           5         0.155         0.097         0.047         0.072           6         0.155         0.097         0.047         0.072           5         0.155         0.097         0.046         0.053								
1         0.093         0.126         0.068         0.094         0.052         0.062           2         0.109         0.141         0.059         0.099         0.027         0.064           3         0.133         0.156         0.055         0.096         0.046         0.053           4         0.124         0.133         0.056         0.102         0.046         0.053           5         0.136         0.173         0.062         0.123         0.046         0.056           Distance from Water (ft)         Open Circuit         200 Resistor         500 Q Resistor         500 Q Resistor           3         0.138         0.102         0.073         0.047         0.072         0.047           4         0.151         0.097         0.047         0.072         0.047         0.072         0.072         0.072         0.047         0.072         0.072         0.072         0.072         0.072         0.047         0.072         0.072         0.047         0.072         0.072         0.072         0.047         0.072         0.072         0.047         0.072         0.072         0.047         0.072         0.047         0.050         0.072         0.047	Baseline	Equipotential Voltag	e Measurement	s - POOL EQUIPMENT	OFF (Water-to-De	eck) - VAC	÷	
2         0.109         0.141         0.059         0.099         0.027         0.064           3         0.103         0.156         0.056         0.099         0.045         0.043           4         0.124         0.163         0.056         0.102         0.045         0.043           5         0.136         0.173         0.062         0.123         0.046         0.056           Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           2         0.138         0.102         0.073         0.047         0.048         0.046         0.037 </td <td>Distance from Water (ft)</td> <td>Open Circuit - 4/9</td> <td>4/14</td> <td>200 Ω Resistor-4/9</td> <td>4/14</td> <td>500 Ω Resistor-4/9</td> <td>4/14</td>	Distance from Water (ft)	Open Circuit - 4/9	4/14	200 Ω Resistor-4/9	4/14	500 Ω Resistor-4/9	4/14	
3         0.103         0.156         0.056         0.096         0.046         0.053           4         0.124         0.163         0.056         0.102         0.045         0.046           5         0.135         0.173         0.062         0.123         0.046         0.056           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.153         0.115         0.072         200 Ω Resistor           3         0.038         0.102         0.073         300 Ω Resistor           3         0.138         0.102         0.077         0.047           5         0.155         0.097         0.047           5         0.155         0.095         0.072           1         0.224         0.137         0.116           1         0.224         0.137         0.116           1         0.224         0.137         0.116           2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117		0.093	0.126	0.068	0.094	0.052	0.062	
4         0.124         0.163         0.056         0.102         0.045         0.043           5         0.136         0.173         0.062         0.123         0.046         0.056           Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           2         0.138         0.102         0.073           3         0.138         0.106         0.037           4         0.051         0.097         0.047           5         0.155         0.095         0.072           Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116         0.106           2         0.241         0.162         0.117         0.112         0.122         0.122         0.112           5         0.248         0.168         0.117         0.116         0.106         0.117           5         0.248         0.168         0.117         0.128         0.128         0.128 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>								
S         0.136         0.173         0.062         0.123         0.046         0.056           Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.153         0.115         0.072           2         0.138         0.106         0.037           3         0.151         0.097         0.047           5         0.155         0.095         0.072           Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor           5         0.155         0.095         0.072           1         0.224         0.187         0.116           2         0.244         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit								
Simulated Fault Test: 60 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Q Resistor         500 Q Resistor           2         0.133         0.115         0.072           3         0.138         0.100         0.037           4         0.051         0.097         0.047           5         0.155         0.095         0.072           Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Q Resistor         500 Q Resistor           1         0.224         0.187         0.116           2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Q Resistor         500 Q Resistor           1         0.228         0.152         0.112         5           5         0.248         0.168								
Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.153         0.115         0.072           2         0.138         0.102         0.073           3         0.138         0.106         0.037           4         0.151         0.097         0.047           5         0.155         0.095         0.072           Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116         166           2         0.241         0.162         0.107         3         0.229         0.116         0.106         4         0.228         0.152         0.112         0.112         0.12         0.12         0.12         0.112         0.112         0.112         0.112         0.112         0.12         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112	5	0.136	0.173	0.062	0.123	0.046	0.056	
Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.153         0.115         0.072           2         0.138         0.102         0.073           3         0.138         0.106         0.037           4         0.151         0.097         0.047           5         0.155         0.095         0.072           Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116         166           2         0.241         0.162         0.107         3         0.229         0.116         0.106         4         0.228         0.152         0.112         0.112         0.12         0.12         0.12         0.112         0.112         0.112         0.112         0.112         0.12         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112         0.112	Simula	ted Fault Test: 60 VA	- Equinotential	Voltage Measuremen	ts (Water-to-Der	k) - VAC		
1         0.153         0.115         0.072           2         0.138         0.102         0.073           3         0.138         0.106         0.037           4         0.151         0.097         0.047           5         0.155         0.095         0.072           Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116           2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183           2         0.341         0.245         0.178           3         0.345         0.252         0.151           A si 39 pool -Weather: 74, 41% humid							istor	
2         0.138         0.102         0.073           3         0.138         0.106         0.037           4         0.151         0.097         0.047           5         0.155         0.095         0.072           Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116           2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.133           2         0.341         0.245         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205								
4         0.151         0.097         0.047           5         0.155         0.095         0.072           Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116           2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205         0.155           4         0.353         0.242         0.158           5         0.351         0.205         0.155 <td colspater="" for<="" td=""><td>2</td><td></td><td></td><td>0.10</td><td>2</td><td></td><td></td></td>	<td>2</td> <td></td> <td></td> <td>0.10</td> <td>2</td> <td></td> <td></td>	2			0.10	2		
S         0.155         0.095         0.072           Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC         S00 Ω Resistor           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116         0.106           2         0.241         0.162         0.107           3         0.229         0.116         0.066           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC         Distance from Water (ft)         Open Circuit         200 Ω Resistor           1         0.322         0.252         0.183         2         0.178           3         0.345         0.252         0.183         2         0.155           4         0.353         0.242         0.158         5         0.351         0.205         0.155           5         0.351         0.205         0.155         0.155           6         0.531         0.205         0.155           6         0.351         0.205         0.155	3	0.13	8	0.10	6	0.037		
Simulated Fault Test: 90 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116           2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183           2         0.341         0.245         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205         0.155           Final Observations & Sign-Off           Observations & Sign-Off           Si Pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected di	4	0.15	1	0.09	7	0.047		
Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116           2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183         0.252         0.183           2         0.341         0.245         0.178         0.158         0.252         0.151           4         0.353         0.242         0.158         0.55         0.155         0.155           5         0.351         0.205         0.158         0.55         0.155           Final Observations & Sign-Off           Observations & Sign-Off           Signiture: Value test done connected directly to pool wat to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (10:00 AM, 4/14)           Observations	5	0.15	5	0.09	5	0.072		
Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.224         0.187         0.116           2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183         0.252         0.183           2         0.341         0.245         0.178         0.155         0.178           3         0.345         0.252         0.151         0.155         0.1								
1         0.224         0.187         0.116           2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC         Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.113         2         0.178         3         0.341         0.245         0.178           3         0.345         0.252         0.183         0.178         3         0.351         0.252         0.151           4         0.353         0.242         0.158         5         0.351         0.205         0.155           Final Observations & Sign-Off           Discovertions & Sign-Off           15' x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wat to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (1:00 0 AM, 4/14)           Test Completed by:         Name					-	· · · · · · · · · · · · · · · · · · ·		
2         0.241         0.162         0.107           3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183           2         0.341         0.245         0.151           4         0.353         0.242         0.151           4         0.353         0.242         0.151           4         0.353         0.242         0.155           Final Observations & Sign-Off           Diservations & Sign-Off           Diservations & Sign-Off           Signature: Value wather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wat to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (1:000 AM, 4/14)           Test Completed by:           Name: Kristoffer Costa           Name: Kristo	. ,							
3         0.229         0.116         0.106           4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC         Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183           2         0.341         0.245         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205         0.155           Final Observations & Sign-Off           Observations & Sign-Off           Test Completed by:           Name: Kristoffer Costa           Signature:								
4         0.228         0.152         0.112           5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC         Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183         0.178           2         0.341         0.245         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205         0.155           Final Observations & Sign-Off           Understring to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (1:00 AM, 4/14)           Observations           Test Completed by:           Name: Kristoffer Costa           Name: Kristoffer Costa           Name: Kristoffer Costa           Signature:								
5         0.248         0.168         0.117           Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC         Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183           2         0.341         0.245         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205         0.155           Final Observations & Sign-Off           Vertices & Sign-Off           Signature:           Observations & Signature:								
Simulated Fault Test: 120 VAC - Equipotential Voltage Measurements (Water-to-Deck) - VAC           Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183           2         0.341         0.245         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205         0.155           Final Observations & Sign-Off           IS'x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (1:00 AM, 4/14)           Test Completed by:           Name: Kristoffer Costa           Name: Kristoffer Costa           Name: Kristoffer Costa           Name: Kristoffer Costa           Signature:           Signature:			-					
Distance from Water (ft)         Open Circuit         200 Ω Resistor         500 Ω Resistor           1         0.322         0.252         0.183           2         0.341         0.245         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205         0.155           Final Observations & Sign-Off           Final Observations & Sign-Off           Distance from Weather: 74F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wait to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (1:0:00 AM, 4/14)           Test Completed by:           Image: Kristoffer Costa           Name: Kristoffer Costa           Name: Kristoffer Costa           Signature:           Signature:					-			
1         0.322         0.252         0.183           2         0.341         0.245         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205         0.155           Final Observations & Sign-Off           Final Observations & Sign-Off           Observations & Sign-Off           Test Completed by:           Name: Kristoffer Costa           Name: Kristoffer Costa           Title: EMC Technician - IIA           Signature:	Simulat	ted Fault Test: 120 VA	C - Equipotentia	I Voltage Measureme	nts (Water-to-De	ck) - VAC	· · ·	
2         0.341         0.245         0.178           3         0.345         0.252         0.151           4         0.353         0.242         0.158           5         0.351         0.205         0.155           Final Observations & Sign-Off         15'x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (10:00 AM, 4/14)           Test Completed by:         Name:         John Antonelli           Title:         EMC Technician - IIIA         Title: VP - SunSmart Engineering           Signature:         Signature:         Signature:	Jillulu		rcuit	200 Ω Re	sistor	500 Ω Res	istor	
3     0.345     0.252     0.151       4     0.353     0.242     0.158       5     0.351     0.205     0.155   Final Observations & Sign-Off       IS'x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (1:00 AM, 4/14)   Test Completed by:       Name:     Kristoffer Costa     Name:     John Antonelli       Title:     EMC Technician - IIA     Title: VP - SunSmart Engineering       Signature:     Signature:     Signature:	Simula	Open Ci	rean			0.103		
4     0.353     0.242     0.158       5     0.351     0.205     0.155       Final Observations & Sign-Off       Inal Observations & Sign-Off       Observations & Sign-Off       Observations & Sign-Off       IS' x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (10:00 AM, 4/14)       Test Completed by:       Name: Kristoffer Costa       Name: Kristoffer Costa       Title: [VP - SunSmart Engineering       Signature:	Distance from Water (ft)					0.183		
5     0.351     0.205     0.155       Final Observations & Sign-Off       Is' x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFC loutlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (10:00 AM, 4/14)       Test Completed by:     Name: Kristoffer Costa     Name: John Antonelli       Title:     EMC Technician - IIA     Title: VP - SunSmart Engineering       Signature:     Signature:     Signature:	Distance from Water (ft) 1 2	0.32	2	0.25	2 5	0.178		
Final Observations & Sign-Off           IS'x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (10:00 AM, 4/14)           Test Completed by:           Name: Kristoffer Costa           Name: Kristoffer Costa           Title: EMC Technician - IIA           Signature:	Distance from Water (ft) 1 2 3	0.32 0.34 0.34	2 1 5	0.25 0.24 0.25	2 5 2	0.178		
15'x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (10:00 AM, 4/14)         Test Completed by:	Distance from Water (ft) 1 2 3 4	0.32 0.34 0.34 0.35	2 1 5 3	0.25 0.24 0.25 0.24	2 5 2 2	0.178 0.151 0.158		
15' x 39' pool - Weather: 74 F, 41% humidity at time of test (1:00 PM, 4/9) - Water bonding plate installed in skimmer - No access to non-GFCI outlets; fault testing to be completed Monday 4/14 - Voltage test done connected directly to pool wa to remote earth rod on 4/14 - Weather: 69 F, 62% humidity at time of test (10:00 AM, 4/14)         Test Completed by:	Distance from Water (ft) 1 2 3 4	0.32 0.34 0.34 0.35	2 1 5 3	0.25 0.24 0.25 0.24	2 5 2 2	0.178 0.151 0.158		
Name:         Kristoffer Costa         Name:         John Antonelli           Title:         EMC Technician - IIA         Title:         VP - SunSmart Engineering           Signature:         Signature:         Signature:	Distance from Water (ft) 1 2 3 4	0.32 0.34 0.34 0.35 0.35	2 1 5 3 1	0.25 0.24 0.25 0.24 0.20	2 5 2 2	0.178 0.151 0.158		
Name:         Kristoffer Costa         Name:         John Antonelli           Title:         EMC Technician - IIA         Title:         VP - SunSmart Engineering           Signature:         Signature:         Signature:	Distance from Water (ft)  1  2  3  4  5	0.32 0.34 0.34 0.35 0.35 15' x 39' pool - Weathe access to non-GFCI out	2 1 5 3 1 Final Observa Fr: 74 F, 41% humic tlets; fault testing	0.25 0.24 0.25 0.24 0.20 tions & Sign-Off lity at time of test (1:00 to be completed Monda	2 5 2 2 5 5 PM, 4/9) - Water br ay 4/14 - Voltage te	0.178 0.151 0.158 0.155 0.155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0151 0.0152 0.0151 0.0151 0.0152 0.0151 0.0152 0.0151 0.0152 0.0151 0.0152 0.0151 0.01550 0.01555 0.01550000000000	skimmer - No	
Title:         EMC Technician - IIA         Title:         VP - SunSmart Engineering           Signature:         Signature: <td< td=""><td>Distance from Water (ft)  1  2  3  4  5</td><td>0.32 0.34 0.34 0.35 0.35 15' x 39' pool - Weathe access to non-GFCI out</td><td>2 1 5 3 1 Final Observa Fr: 74 F, 41% humic tlets; fault testing</td><td>0.25 0.24 0.25 0.24 0.20 tions &amp; Sign-Off lity at time of test (1:00 to be completed Monda</td><td>2 5 2 2 5 5 PM, 4/9) - Water br ay 4/14 - Voltage te</td><td>0.178 0.151 0.158 0.155 0.155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0151 0.0152 0.0151 0.0151 0.0152 0.0151 0.0152 0.0151 0.0152 0.0151 0.0152 0.0151 0.01550 0.01555 0.01550000000000</td><td>skimmer - No</td></td<>	Distance from Water (ft)  1  2  3  4  5	0.32 0.34 0.34 0.35 0.35 15' x 39' pool - Weathe access to non-GFCI out	2 1 5 3 1 Final Observa Fr: 74 F, 41% humic tlets; fault testing	0.25 0.24 0.25 0.24 0.20 tions & Sign-Off lity at time of test (1:00 to be completed Monda	2 5 2 2 5 5 PM, 4/9) - Water br ay 4/14 - Voltage te	0.178 0.151 0.158 0.155 0.155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0151 0.0152 0.0151 0.0151 0.0152 0.0151 0.0152 0.0151 0.0152 0.0151 0.0152 0.0151 0.01550 0.01555 0.01550000000000	skimmer - No	
Signature: Signature:	Distance from Water (ft)	0.32 0.34 0.34 0.35 0.35 15' x 39' pool - Weathe access to non-GFCI out	2 1 5 3 1 Final Observa Fr: 74 F, 41% humic tlets; fault testing	0.25 0.24 0.25 0.24 0.20 tions & Sign-Off lity at time of test (1:00 to be completed Monda	2 5 2 2 5 5 PM, 4/9) - Water br ay 4/14 - Voltage te	0.178 0.151 0.158 0.155 0.155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0151 0.0152 0.0151 0.0151 0.0152 0.0151 0.0152 0.0151 0.0152 0.0151 0.0152 0.0151 0.01550 0.01555 0.01550000000000	skimmer - No	
	Distance from Water (ft)  1  2  3  4  5  Observations  Test Completed by:	0.32 0.34 0.34 0.35 0.35 15' x 39' pool - Weathe access to non-GFCI out to remote earth rod or	2 1 5 3 1 Final Observa Fr: 74 F, 41% humic tlets; fault testing	0.25 0.24 0.25 0.24 0.20 tions & Sign-Off lity at time of test (1:00 to be completed Monda	2 5 2 2 5 5 9 PM, 4/9) - Water bod py 4/14 - Voltage te py 4/14 - Voltage te	0.178 0.151 0.158 0.155 0.155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0155 0.0151 0.0151 0.0151 0.0151 0.0151	skimmer - No	
	Distance from Water (ft)	0.32 0.34 0.34 0.35 0.35 0.35 15' x 39' pool - Weathe access to non-GFCI out to remote earth rod or to remote earth rod or	2 1 5 3 1 Final Observa Fr: 74 F, 41% humic tlets; fault testing	0.25 0.24 0.25 0.24 0.20 tions & Sign-Off lity at time of test (1:00 to be completed Monda	2 5 2 2 5 5 9 PM, 4/9) - Water bu sy 4/14 - Voltage te ne of test (10:00 AN 0 0 Name: Title:	0.178 0.151 0.155 0.155 0.155 0.155 0.155 0.155 0.155 0.155 0.155 0.155 0.155 0.155 0.155 0.155 0.155	skimmer - No tly to pool wat	



### 8.3.6 Test Data, Pool #5, 13331 Sugarloaf Ct, Clermont, FL

	Pool Bonding & Equipo		
	POOL IN	FORMATION	
Pool ID	Test Pool #5		
Location	13331 Sugarloaf Ct, Clermont, FL 347	15	
l Type (Concrete/Fiberglass/Vinyl)			
ing Type (Wire Loop/Copper Grid)	In-line bonding, water bond plate in s	kimmer	
Date of Test			
Tested By	Kristoffer Costa (IIA), John Antonelli (	SunSmart Engineering)	
Witnessed By	Michael Ramee (Mad River Pools)		
,			
		RTH GROUND ROD	-
Location		2	3
Description			
Bonding to Earth Ground (Ω)		1ENT GROUND	
			3
Location		2 Lighting Controller to Pump Lug	
Description		0.2	Chlorinator to Pool Panel 0.3
Bonding to Equip. Ground (Ω)	0.2	0.2	0.3
Basalina	Equipotential Voltage Measurement	s - POOL EQUIPMENT ON (Water-to-De	nck) VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.040	0.019	0.007
2	0.039	0.013	0.007
3	0.035	0.017	0.008
4	0.042	0.021	0.010
5	0.047	0.021	0.010
	0.017	0.021	0.011
Baseline	Equinotential Voltage Measurement	s - POOL EQUIPMENT OFF (Water-to-D	eck) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.027	0.015	0.005
2	0.028	0.014	0.005
3	0.027	0.014	0.006
4	0.030	0.015	0.009
5 Simulat		0.015 0.016	
5	0.031	0.016	0.008
5 Simulal Distance from Water (ft) 1	0.031 ted Fault Test: 60 VAC - Equipotentia Open Circuit 0.135	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081	0.008 <b>ck) - VAC</b> 500 Ω Resistor 0.049
5 Simulat Distance from Water (ft) 1 2	0.031 ted Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126	0.016 Voltage Measurements (Water-to-Dee 200 Ω Resistor 0.081 0.080	0.008 <b>b</b> ) - VAC 500 Ω Resistor 0.049 0.042
5 Simular Distance from Water (ft) 1 2 3	0.031 ted Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094	0.016 Voltage Measurements (Water-to-Dee 200 Ω Resistor 0.081 0.080 0.084	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041
5 Simular Distance from Water (ft) 1 2 3 4	0.031 ted Fault Test: 60 VAC - Equipotentia 0.135 0.126 0.094 0.138	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.080 0.084 0.064	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 Simulat	0.031 ted Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.080 0.084 0.064	0.008 500 Ω Resistor 0.049 0.042 0.041 0.052 0.046 ck) - VAC
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft)	0.031 ted Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135 ted Fault Test: 90 VAC - Equipotentia Open Circuit	0.016 Voltage Measurements (Water-to-Dee 200 Ω Resistor 0.081 0.080 0.084 0.064 0.056 Voltage Measurements (Water-to-Dee 200 Ω Resistor	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 (k) - VAC <b>500 Ω Resistor</b>
5 Simular Distance from Water (ft) 1 2 3 4 5 5 Simular Distance from Water (ft) 1	0.031 ted Fault Test: 60 VAC - Equipotentia 0 Open Circuit 0.135 0.126 0.094 0.138 0.135 ted Fault Test: 90 VAC - Equipotentia Open Circuit 0.190	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.084 0.064 0.066 Uvoltage Measurements (Water-to-Dec 200 Ω Resistor 0.127	0.008 500 Ω Resistor 0.049 0.042 0.041 0.052 0.046 (k) - VAC 500 Ω Resistor 0.062
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2	0.031 ted Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135 ted Fault Test: 90 VAC - Equipotentia Open Circuit 0.190 0.191	0.016 2 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.080 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123	0.008 500 Ω Resistor 0.049 0.042 0.041 0.052 0.046 ck) - VAC 500 Ω Resistor 0.062 0.071
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2 3 3	0.031 ced Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135 ced Fault Test: 90 VAC - Equipotentia Open Circuit 0.190 0.191 0.195	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.084 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> 0.062 0.062 0.071 0.075
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2 3 4	0.031 ced Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135 ced Fault Test: 90 VAC - Equipotentia Open Circuit 0.190 0.191 0.195 0.197	0.016 200 Ω Resistor 0.081 0.080 0.084 0.064 0.056 1 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117 0.117	0.008 500 Ω Resistor 0.049 0.042 0.041 0.052 0.046 ck) - VAC 500 Ω Resistor 0.062 0.071 0.075 0.066
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2 3 3	0.031 ced Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135 ced Fault Test: 90 VAC - Equipotentia Open Circuit 0.190 0.191 0.195	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.084 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> 0.062 0.062 0.071 0.075
5 Simular Distance from Water (ft) 1 2 3 4 5 Simular 5 Distance from Water (ft) 1 2 3 4 5 3 4 5	0.031 ted Fault Test: 60 VAC - Equipotentia 0 0 0.135 0.126 0.094 0.138 0.135 ted Fault Test: 90 VAC - Equipotentia 0 pen Circuit 0.190 0.191 0.195 0.197 0.203	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.080 0.084 0.064 0.066 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117 0.117 0.121	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> <b>500 Ω Resistor</b> 0.062 0.071 0.075 0.066 0.052
5 Simulat Distance from Water (ft) 1 2 3 4 4 5 Simulat Distance from Water (ft) 1 2 3 4 4 5 5 Simulat 5 Simulat	0.031 ced Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135 ced Fault Test: 90 VAC - Equipotentia Open Circuit 0.190 0.191 0.195 0.197 0.203 ced Fault Test: 120 VAC - Equipotentia	0.016 Voltage Measurements (Water-to-Dec 0.081 0.084 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117 0.117 0.117 0.121 Voltage Measurements (Water-to-Dec 0.123 0.117 0.121 0.121	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> <b>500 Ω Resistor</b> 0.062 0.071 0.075 0.066 0.052 0.052 0.052 0.052
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 5 0 1 2 3 4 5 5 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031  ted Fault Test: 60 VAC - Equipotentia  Open Circuit  0.135  0.126 0.094 0.138 0.135 ted Fault Test: 90 VAC - Equipotentia  Open Circuit 0.190 0.191 0.195 0.197 0.203 ed Fault Test: 120 VAC - Equipotentia Open Circuit	0.016 Voltage Measurements (Water-to-Dec 0.081 0.080 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117 0.117 0.117 0.121 sl Voltage Measurements (Water-to-Dec 200 Ω Resistor	0.008 500 Ω Resistor 0.049 0.042 0.041 0.052 0.046 (0.062 0.062 0.071 0.066 0.052 0.066 0.052 (0.052 0.066 0.052 0.066 0.052 (0.052 0.066 0.052 (0.052 0.066 0.052 (0.052 0.066 0.052 (0.052 (0.065 0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.075 0.066 0.052 (0.052 (0.075 0.066 0.052 (0.075 0.066 (0.052 (0.075 0.066 (0.052 (0.052 (0.075 (0.052 (0.075 (0.052 (0.052 (0.075 (0.052 (0.052 (0.075 (0.052 (0.052 (0.052 (0.075 (0.052 (0.052 (0.052 (0.052 (0.075 (0.052 (0.052 (0.052 (0.052 (0.075 (0.052 (0
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2 3 4 5 5 Simulat 5 Simulat 5 Simulat 5 Simulat 1 Distance from Water (ft) 1	0.031 ced Fault Test: 60 VAC - Equipotentia 0 0 0.135 0.126 0.094 0.138 0.135 0.135 0.135 0.135 0.135 0.135 0.190 0.191 0.195 0.197 0.203 ced Fault Test: 120 VAC - Equipotentia 0 pen Circuit 0.257	0.016 200 Ω Resistor 0.081 0.080 0.084 0.064 0.056 200 Ω Resistor 0.127 0.123 0.117 0.123 0.117 0.121 0.117 0.121 0.121 0.169	0.008 500 Ω Resistor 0.049 0.042 0.041 0.052 0.046 ck) - VAC 500 Ω Resistor 0.062 0.071 0.075 0.066 0.052 ck) - VAC 500 Ω Resistor 0.082
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031 ced Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135 0.135 0.135 0.135 0.135 0.135 0.190 0.191 0.199 0.197 0.203 ced Fault Test: 120 VAC - Equipotentia Open Circuit 0.197 0.203 construction 0.257 0.230	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.080 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117 0.117 0.121 1 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.159	0.008 500 Ω Resistor 0.049 0.042 0.041 0.052 0.046 (0.071) 0.062 0.071 0.075 0.066 0.075 0.066 0.052 (0.075) 0.066 0.052 (0.052) (0.071) (0.052) (0.052) (0.071) (0.052) (0.052) (0.071) (0.052) (0.071) (0.052) (0.071) (0.052) (0.052) (0.071) (0.052) (0.071) (0.052) (0.072) (0.072) (0.072) (0.072) (0.072) (0.071) (0.052) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.072) (0.052) (0.072) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.052) (0.082) (0.082) (0.088)
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 0 1 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031  ted Fault Test: 60 VAC - Equipotentia  Open Circuit  0.135  0.126 0.094 0.138 0.135 ted Fault Test: 90 VAC - Equipotentia  Open Circuit 0.199 0.191 0.195 0.197 0.203  ed Fault Test: 120 VAC - Equipotentia  Open Circuit 0.257 0.230 0.245	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117 0.117 0.117 0.121 1Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.159 0.155	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> 0.066 0.071 0.066 0.075 0.066 0.052 <b>Ck) - VAC</b> <b>500 Ω Resistor</b> 0.066 0.052 <b>Ck) - VAC</b>
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 5 5 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031 Open Circuit 0.135 0.126 0.094 0.138 0.135 0.126 0.094 0.138 0.135 ced Fault Test: 90 VAC - Equipotentia 0.190 0.191 0.195 0.197 0.203 0.203 0.203 0.230 0.245 0.248	0.016 Voltage Measurements (Water-to-Dec 0.081 0.080 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117 0.117 0.117 0.117 0.121 0.159 0.159 0.155 0.164	0.008 500 Ω Resistor 0.049 0.042 0.041 0.052 0.046 500 Ω Resistor 0.062 0.071 0.066 0.075 0.066 0.052 0.052 0.052 0.052 0.052 0.052 0.086 0.052 0.082 0.089 0.089 0.094
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 0 1 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031  ted Fault Test: 60 VAC - Equipotentia  Open Circuit  0.135  0.126 0.094 0.138 0.135 ted Fault Test: 90 VAC - Equipotentia  Open Circuit 0.199 0.191 0.195 0.197 0.203  ed Fault Test: 120 VAC - Equipotentia  Open Circuit 0.257 0.230 0.245	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117 0.117 0.117 0.121 1Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.159 0.155	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> 0.066 0.071 0.066 0.075 0.066 0.052 <b>Ck) - VAC</b> <b>500 Ω Resistor</b> 0.066 0.052 <b>Ck) - VAC</b>
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 5 5 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031  ted Fault Test: 60 VAC - Equipotentia  Open Circuit  0.135  0.126 0.094 0.138 0.135 ted Fault Test: 90 VAC - Equipotentia  Open Circuit 0.190 0.191 0.195 0.197 0.203  ed Fault Test: 120 VAC - Equipotentia  Open Circuit 0.257 0.230 0.245 0.248 0.238	0.016 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.081 0.080 0.084 0.064 0.056 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.127 0.123 0.117 0.123 0.117 0.121 Voltage Measurements (Water-to-Dec 200 Ω Resistor 0.155 0.164 0.174	0.008 500 Ω Resistor 0.049 0.042 0.041 0.052 0.046 500 Ω Resistor 0.062 0.071 0.062 0.075 0.066 0.052 0.052 0.052 0.052 0.052 0.052 0.052 0.052 0.052 0.052 0.052 0.089 0.089 0.089 0.094
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 5 5 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031 Open Circuit 0.135 0.126 0.094 0.138 0.135 0.126 0.094 0.138 0.135 0.135 0.135 0.135 0.135 0.191 0.191 0.195 0.197 0.203 0.203 0.257 0.230 0.245 0.248 0.238 0.245 0.248 0.238	0.016           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.081           0.084           0.084           0.064           0.056           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.127           0.123           0.117           0.117           0.117           0.159           159           0.159           0.159           0.164           0.174           0.174	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> <b>500 Ω Resistor</b> 0.062 0.071 0.066 0.052 <b>0.066</b> 0.052 <b>0.052</b> <b>0.066</b> 0.052 <b>0.066</b> 0.052 <b>0.089</b> 0.089 0.089 0.094 0.094 0.105
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 5 5 1 0 1 0 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031 ced Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135 ced Fault Test: 90 VAC - Equipotentia Open Circuit 0.190 0.191 0.195 0.197 0.203 ced Fault Test: 120 VAC - Equipotentia Open Circuit 0.257 0.230 0.248 0.248 0.238 Final Observa 12' x 31' pool - Weather: 76 F, 56% humi	0.016           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.081           0.084           0.084           0.064           0.056           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.127           0.123           0.117           0.117           0.117           0.159           159           0.159           0.159           0.164           0.174           0.174	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> <b>500 Ω Resistor</b> 0.062 0.071 0.066 0.052 <b>0.066</b> 0.052 <b>0.052</b> <b>0.066</b> 0.052 <b>0.066</b> 0.052 <b>0.089</b> 0.089 0.089 0.094 0.094 0.105
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031 ced Fault Test: 60 VAC - Equipotentia Open Circuit 0.135 0.126 0.094 0.138 0.135 ced Fault Test: 90 VAC - Equipotentia Open Circuit 0.190 0.191 0.195 0.197 0.203 ced Fault Test: 120 VAC - Equipotentia Open Circuit 0.257 0.230 0.248 0.248 0.238 Final Observa 12' x 31' pool - Weather: 76 F, 56% humi	0.016           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.081           0.084           0.084           0.064           0.056           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.127           0.123           0.117           0.117           0.117           0.159           159           0.159           0.159           0.164           0.174           0.174	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> <b>500 Ω Resistor</b> 0.062 0.071 0.066 0.052 <b>0.066</b> 0.052 <b>0.052</b> <b>0.066</b> 0.052 <b>0.066</b> 0.052 <b>0.089</b> 0.089 0.089 0.094 0.094 0.105
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031  ted Fault Test: 60 VAC - Equipotentia  0pen Circuit 0.135 0.126 0.094 0.138 0.135 ted Fault Test: 90 VAC - Equipotentia 0.190 0.191 0.195 0.197 0.203  ted Fault Test: 120 VAC - Equipotentia 0pen Circuit 0.257 0.230 0.245 0.245 0.248 0.238 12' x 31' pool - Weather: 76 F, 56% humi test done connected directly to pool was	0.016           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.084           0.064           0.056           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.123           0.117           0.123           0.117           0.121           0.155           0.169           0.155           0.164           0.174           0.174	0.008
5 Simulat Distance from Water (ft) 1 2 3 4 5 Simulat Distance from Water (ft) 1 2 3 4 5 Simulat 0 Simulat 5 Simulat Distance from Water (ft) 1 2 3 4 5 Simulat Distance from Water (ft) 1 2 3 4 5 S Observations Observations Test Completed by: Name:	0.031  ed Fault Test: 60 VAC - Equipotentia  Open Circuit  0.135  0.126 0.094 0.138 0.135  ed Fault Test: 90 VAC - Equipotentia  Open Circuit 0.191 0.195 0.197 0.203  ed Fault Test: 120 VAC - Equipotentia  Open Circuit 0.257 0.230 0.245 0.245 0.248 0.238  Final Observa  12'x 31' pool - Weather: 76 F, 55% humi test done connected directly to pool wa  Kristoffer Costa	0.016           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.084           0.064           0.056           Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.123           0.117           0.123           0.117           0.121           0.155           0.169           0.155           0.164           0.174           0.174	0.008 <b>500 Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>500 Ω Resistor</b> 0.066 0.071 0.066 0.075 0.066 0.052 <b>ck) - VAC</b> <b>500 Ω Resistor</b> 0.066 0.052 <b>ck) - VAC</b> <b>500 Ω Resistor</b> 0.089 0.094 0.094 0.094 0.094 0.094 0.094 0.105 <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b>
5 Simulat Distance from Water (ft) 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.031  ed Fault Test: 60 VAC - Equipotentia  Open Circuit  0.135  0.126 0.094 0.138 0.135 ed Fault Test: 90 VAC - Equipotentia  Open Circuit 0.190 0.191 0.195 0.197 0.203 ed Fault Test: 120 VAC - Equipotentia  Open Circuit 0.257 0.230 0.245 0.245 0.248 0.238  Final Observa 12' x 31' pool - Weather: 76 F, 56% humi test done connected directly to pool wat kristoffer Costa EMC Technician - IIA	0.016           1 Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.081           0.084           0.084           0.084           0.064           0.056           1 Voltage Measurements (Water-to-Dec           200 Ω Resistor           0.127           0.123           0.117           0.121           0.121           0.155           0.169           0.159           0.155           0.164           0.174           0.174	0.008 <b>SOO Ω Resistor</b> 0.049 0.042 0.041 0.052 0.046 <b>SOO Ω Resistor</b> 0.066 0.071 0.075 0.066 0.075 0.066 0.052 <b>Ck) - VAC</b> <b>SOO Ω Resistor</b> 0.082 0.089 0.094 0.094 0.105 Som Presistor 0.089 0.094 0.094 0.105 Som Presistor 0.089 0.094 0.094 0.105 Som Presistor 0.089 0.094 0.094 0.105 Som Presistor 0.089 0.094 0.094 0.094 0.094 0.094 0.094 0.094 0.094 0.005 Som Presistor 0.089 0.094 0.094 0.094 0.094 0.005 Som Presistor 0.089 0.094 0.094 0.094 0.105 Som Presistor 0.094 0.09



#### 8.3.7 Test Data, Pool #6a, 20541 Fieldcrest Ct, Clermont, FL

	Pool Bonding & Equipo	tential Voltage Test Form	
	Test Pool #6	FORMATION	
	20451 Fieldcrest Ct, Clermont, FL 347	45	
l Type (Concrete/Fiberglass/Vinyl)		15	
	In-line bonding, water bond plate in s	kimmor	
Date of Test		KIIIIIEI	
	Kristoffer Costa (IIA), John Antonelli (	SunSmart Engineering)	
		Surprise Engineering/	
Witnessed By	Michael Ramee (Mad River Pools)		
i	CONTINU	JITY TESTING	
	TO REMOTE EA	RTH GROUND ROD	
Location	1 1	2	3
Description	ı		
Bonding to Earth Ground (Ω)	)		
	TO EQUIPM	MENT GROUND	
Location	1	2	3
Description	Pump Lug to Pool Panel	Heat Pump Lug to Pump Lug	Lighting Transformer to Pool Pane
Bonding to Equip. Ground (Ω)	0.5	0.2	0.2
Baseline	Equipotential Voltage Measurement	ts - POOL EQUIPMENT ON (Water-to-De	eck) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.023	0.022	0.014
2	0.027	0.019	0.015
3	0.032	0.025	0.014
4	0.025	0.019	0.015
5	0.037	0.021	0.016
Baseline	Equipotential Voltage Measurement	ts - POOL EQUIPMENT OFF (Water-to-De	eck) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.028	0.017	0.017
2	0.023	0.018	0.015
3	0.025	0.017	0.015
4	0.023	0.021	0.014
5	0.024	0.022	0.017
Simula	ted Fault Test: 60 VAC - Equipotentia	Voltage Measurements (Water-to-Dec	k) - VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.751	0.634	0.472
2	0.772	0.593	0.385
		0.566	0.320
3	0.774		
4	0.753	0.616	0.405
		0.616	0.405 0.419
4 5	0.753 0.771	0.627	0.419
4 5 Simula	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia	0.627	0.419 k) - VAC
4 5 Simula Distance from Water (ft)	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia Open Circuit	0.627 I Voltage Measurements (Water-to-Dec 200 Ω Resistor	0.419 k) - VAC 500 Ω Resistor
4 5 Simula Distance from Water (ft) 1	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia Open Circuit 1.429	0.627 I Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076	0.419 k) - VAC 500 Ω Resistor 0.745
4 5 Simula Distance from Water (ft) 1 2	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia Open Circuit 1.429 1.456	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073	0.419 k) - VAC 500 Ω Resistor 0.745 0.606
4 5 Simula Distance from Water (ft) 1 2 3	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia Open Circuit 1.429 1.456 1.521	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947	0.419 k) - VAC 500 Ω Resistor 0.745 0.606 0.497
4 5 Simula Distance from Water (ft) 1 2 3 4	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia Open Circuit 1.429 1.456 1.521 1.548	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942	0.419 <b>500 Ω Resistor</b> 0.745 0.606 0.497 0.632
4 5 Simula Distance from Water (ft) 1 2 3	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia Open Circuit 1.429 1.456 1.521	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947	0.419 k) - VAC 500 Ω Resistor 0.745 0.606 0.497
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5	0.753 0.771 ed Fault Test: 90 VAC - Equipotentia Open Circuit 1.429 1.456 1.521 1.548 1.533	0.627 1 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938	0.419 500 Ω Resistor 0.745 0.606 0.497 0.632 0.647
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 Simulat	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia Open Circuit 1.429 1.456 1.521 1.548 1.533 eted Fault Test: 120 VAC - Equipotentia	0.627 I Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 I Voltage Measurements (Water-to-De	0.419 500 Ω Resistor 0.745 0.606 0.497 0.632 0.647 ck) - VAC
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft)	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 0pen Circuit 1.429 1.456 1.521 1.548 1.533 ted Fault Test: 120 VAC - Equipotentia Open Circuit	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 al Voltage Measurements (Water-to-Dec 200 Ω Resistor	0.419 500 Ω Resistor 0.745 0.606 0.497 0.632 0.647 ck) - VAC 500 Ω Resistor
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia Open Circuit 1.429 1.456 1.521 1.548 1.533 ted Fault Test: 120 VAC - Equipotentia Open Circuit 1.981	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 I Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545	0.419 <b>500 Ω Resistor</b> 0.745 0.606 0.497 0.632 0.647 <b>ck) - VAC</b> <b>500 Ω Resistor</b> 1.122
4 5 Simula Distance from Water (ft) 1 2 3 4 5 Simulat Distance from Water (ft) 1 2	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 0pen Circuit 1.429 1.456 1.521 1.548 1.533 etel Fault Test: 120 VAC - Equipotentia Open Circuit 1.981 2.081	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435	0.419 <b>500 Ω Resistor</b> 0.745 0.606 0.497 0.632 0.647 <b>500 Ω Resistor</b> 1.122 0.848
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2 3 3	0.753 0.771 eta Fault Test: 90 VAC - Equipotentia Open Circuit 1.429 1.456 1.521 1.548 1.533 eta Fault Test: 120 VAC - Equipotentia Open Circuit 1.981 2.081 2.084	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.320	0.419 <b>500 Ω Resistor</b> 0.745 0.606 0.497 0.632 0.647 <b>500 Ω Resistor</b> 1.122 0.848 0.752
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2 3 4 4 5 5 3 4 4 4 4 4 4	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 0pen Circuit 1.429 1.456 1.521 1.548 1.533 ted Fault Test: 120 VAC - Equipotentia 0pen Circuit 1.981 2.081 2.083	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 0.947 0.942 0.938 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.320 1.416	0.419 500 Ω Resistor 0.745 0.606 0.497 0.632 0.647 0.647 0.647 0.647 0.648 0.752 0.848 0.752 0.873
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2 3 3	0.753 0.771 eta Fault Test: 90 VAC - Equipotentia Open Circuit 1.429 1.456 1.521 1.548 1.533 eta Fault Test: 120 VAC - Equipotentia Open Circuit 1.981 2.081 2.084	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.320	0.419 <b>500 Ω Resistor</b> 0.745 0.606 0.497 0.632 0.647 <b>500 Ω Resistor</b> 1.122 0.848 0.752
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2 3 4 4 5 5 3 4 4 4 4 4 4	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 0pen Circuit 1.429 1.456 1.521 1.548 1.533 ed Fault Test: 120 VAC - Equipotentia 0pen Circuit 1.981 2.081 2.084 2.083 2.054	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 I Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.320 1.416 1.454	0.419 500 Ω Resistor 0.745 0.606 0.497 0.632 0.647 0.647 0.647 0.647 0.648 0.752 0.848 0.752 0.873
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 Simulat Distance from Water (ft) 1 2 3 4 4 5 5 3 4 4 4 4 4 4	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 0pen Circuit 1.429 1.456 1.521 1.548 1.533 red Fault Test: 120 VAC - Equipotentia Open Circuit 1.981 2.081 2.084 2.084 2.054 Final Observa	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.073 0.947 0.942 0.938 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.320 1.416 1.454 1.454 titions & Sign-Off dity at time of test (11:45 AM) - Water bond	0.419 500 Ω Resistor 0.745 0.606 0.497 0.632 0.647 ck) - VAC 500 Ω Resistor 1.122 0.848 0.752 0.873 1.112
4 5 Simula Distance from Water (ft) 1 2 3 4 5 Simulat Distance from Water (ft) 1 2 3 4 5 Simula 4 5 3 4 5 5 1 1 2 5 5 5 5 5 5 6 6 7 8 8 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 0pen Circuit 1.429 1.456 1.521 1.548 1.533 ed Fault Test: 120 VAC - Equipotentia 0pen Circuit 1.981 2.084 2.083 2.054 Final Observa 15'x 30' pool - Weather: 76 F, 56% humi	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.073 0.947 0.942 0.938 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.320 1.416 1.454 1.454 titions & Sign-Off dity at time of test (11:45 AM) - Water bond	0.419 500 Ω Resistor 0.745 0.606 0.497 0.632 0.647 ck) - VAC 500 Ω Resistor 1.122 0.848 0.752 0.873 1.112
4 5 Simula Distance from Water (ft) 1 2 3 4 5 Simulat Distance from Water (ft) 1 2 3 4 5 Simulat Distance from Water (ft) 1 2 3 4 5 Simulat 0 Simulat 0 Simulat 0 Simulat 5 Simulat 0 Simulat Simulat 0 Simulat Simulat 0 Simulat Simulat 0 Simulat 0 Simulat 0 Simulat Simulat 0 Simulat	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 0pen Circuit 1.429 1.456 1.521 1.548 1.533 ed Fault Test: 120 VAC - Equipotentia 0pen Circuit 1.981 2.084 2.083 2.054 Final Observa 15'x 30' pool - Weather: 76 F, 56% humi	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.073 0.947 0.942 0.938 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.320 1.416 1.454 1.454 titions & Sign-Off dity at time of test (11:45 AM) - Water bond	0.419 500 Ω Resistor 0.745 0.606 0.497 0.632 0.647 ck) - VAC 500 Ω Resistor 1.122 0.848 0.752 0.873 1.112
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 5 5 5 5 1 2 3 4 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 1.429 1.456 1.521 1.548 1.533 ted Fault Test: 120 VAC - Equipotentia Open Circuit 1.981 2.081 2.084 2.083 2.054 Final Observa 15' x 30' pool - Weather: 76 F, 56% humi test done connected directly to pool wa	0.627 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 al Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.320 1.416 1.454 titions & Sign-Off dity at time of test (11:45 AM) - Water bond ater to remote earth rod	0.419
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 1 Distance from Water (ft) 1 2 3 4 5 0 Distance from Water (ft) 1 2 3 4 5 0 Distance from Water (ft) 1 C Cobservations 0 Distervations Test Completed by: Name:	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 0pen Circuit 1.429 1.456 1.521 1.548 1.533 ced Fault Test: 120 VAC - Equipotentia 0pen Circuit 1.981 2.081 2.084 2.083 2.054 Final Observa 15' x 30' pool - Weather: 76 F, 56% humi test done connected directly to pool wa	0.627  Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.435 1.435 1.435 1.435 1.435 4.416 1.454 4.45 4.	0.419 <b>500 Ω Resistor</b> 0.745 0.606 0.497 0.632 0.647 <b>500 Ω Resistor</b> 1.122 0.848 0.752 0.873 1.112 ing plate installed in skimmer - Voltag
4 5 Simula Distance from Water (ft) 1 2 3 4 5 5 1 Distance from Water (ft) 1 2 3 4 5 0 Distance from Water (ft) 1 2 3 4 5 0 Distance from Water (ft) 1 C Cobservations 0 Distervations Test Completed by: Name:	0.753 0.771 ted Fault Test: 90 VAC - Equipotentia 0pen Circuit 1.429 1.456 1.521 1.548 1.533 ed Fault Test: 120 VAC - Equipotentia 0pen Circuit 1.981 2.081 2.084 2.084 2.083 2.054 Final Observa 15' x 30' pool - Weather: 76 F, 56% humi test done connected directly to pool wa kristoffer Costa EMC Technician - IIA	0.627  Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.076 1.073 0.947 0.942 0.938 Voltage Measurements (Water-to-Dec 200 Ω Resistor 1.545 1.435 1.435 1.435 1.435 1.435 1.435 4.416 1.454 4.45 4.	0.419 <b>500 Ω Resistor</b> 0.745 0.606 0.497 0.632 0.647 <b>500 Ω Resistor</b> 1.122 0.848 0.752 0.873 1.112 ing plate installed in skimmer - Voltag



#### 8.3.8 Test Data, Pool #6b, RECHECK, 20541 Fieldcrest Ct, Clermont, FL

	Pool Bonding & Equipoter	ntial Voltage Test Form	
	POOL INFOR	MATION	
Pool ID	Test Pool #6		
	20541 Fieldcrest Ct. Clermont, FL. 34715		
ool Type (Concrete/Fiberglass/Vinyl)			
	In-line bonding, water bond plate in skim	mer	
Date of Test			
Tested By	Kristoffer Costa (IIA), John Antonelli (Sun	Smart Engineering)	
Witnessed By	Michael Ramee (Mad River Pools)		
	CONTINUITY TO REMOTE EARTH		
Location		2	3
Description Bonding to Earth Ground (Ω)			
, , , , , , , , , , , , , , , , , , ,	TO EQUIPMEN	T GROUND	
Location	1	2	3
Description	Lighting Transformer to Pool Panel	?? to Pool Pump	Pump Lug to Pool Panel
Bonding to Equip. Ground (Ω)	0.2	0.2	0.5
	Baseline Equipotential Voltage Meas		
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.023	0.022	0.014
2	0.027	0.019	0.015
3	0.032	0.025	0.014
4	0.025	0.019	0.015
5	0.037	0.021	0.016
	ted Fault Test: 60 VAC - Equipotential Vo		
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	0.805	0.249	0.451
2	0.812	0.243	0.498
3 4	0.816	0.294 0.279	0.539
5	0.816	0.243	0.533 0.487
5	0.812	0.243	0.487
Simulat	ted Fault Test: 90 VAC - Equipotential Vo	oltage Measurements (Water-to-Deck)	- VAC
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	1.216	0.311	0.665
2	1.233	0.403	0.725
3	1.222	0.423	0.826
4	1.226	0.376	0.757
5	1.232	0.326	0.757
	ed Fault Test: 120 VAC - Equipotential V		
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor
1	1.643	0.477	1.158/ 1.085
2	1.641	0.496	1.163/ 1.115
3	1.652	0.626	1.222/ 1.176
4	1.657	0.526	1.191/ 1.147
5	1.661	0.54	1.186/ 1.154
Observations	Final Observatio		
Test Completed by:			
Name	Kristoffer Costa	Name:	John Antone
Title:	EMC Technician - IIA	Title:	VP - SunSmart Engineerir
Signature		Signature:	
Date	6/10/2025	Date:	6/10/202



#### 8.3.9 Test Data, Pool #7, 5753 Timber Meadow Way, St Cloud, FL

	Pool Bonding & Equipor	tential Voltage Test Form				
	POOL INF	ORMATION				
Pool ID	Test Pool #7					
	5753 Timber Mdw Wy, St Cloud, FL 34	771				
l Type (Concrete/Fiberglass/Vinyl)	Concrete with Concrete Deck					
ng Type (Wire Loop/Copper Grid)	#8 wire loop					
Date of Test	4/15/2025					
Tested By	istoffer Costa (IIA), John Antonelli (SunSmart Engineering)					
Witnessed By	Richard Moseley (Holland Pools)					
Location		TH GROUND ROD 2	3			
Description						
Bonding to Earth Ground (Ω)						
Bonding to Larth Ground (32)		ENT GROUND				
Location	1	2	3			
Description	-					
Bonding to Equip. Ground (Ω)	Pump Lug to Lighting J-box 0.1	Lighting Transformer to Pump Lug 0.3	LightingTransformer to Pool Pane 0.2			
containg to Equip. Ground (Ω)	0.1	0.5	0.2			
Bacalina	Equipotential Voltage Measurement	s - POOL EQUIPMENT ON (Water-to-De	ack) - VAC			
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor			
1	0.011	0.007	0.032			
2	0.007	0.007	0.032			
3	0.007	0.008	0.012			
4	0.010	0.017	0.018			
5	0.009	0.011	0.012			
5	0.000	0.009	0.010			
Bacolina	Equipotential Voltage Measurement	s - POOL EQUIPMENT OFF (Water-to-De	ack) - VAC			
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor			
1	0.008	0.008	0.008			
2	0.008	0.008	0.008			
3	0.008	0.008	0.008			
4	0.008	0.009	0.011			
5	0.007	0.009	0.009			
	0.000	0.010	0.005			
Simulat	ed Fault Test: 60 VAC - Equinotential	Voltage Measurements (Water-to-Dec				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor			
1	0.021	0.022	0.013			
2	0.021	0.022	0.015			
3	0.018	0.024	0.015			
4	0.021	0.017	0.021			
5	0.021	0.021	0.021			
3	0.010	0.021	0.019			
Simulat	red Fault Test: 90 VAC - Equipotential	Voltage Measurements (Water-to-Dec				
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor			
1	0.024	0.025	0.030			
2	0.024	0.025	0.030			
3	0.029	0.025	0.020			
4	0.024	0.027	0.020			
5	0.032	0.027	0.023			
5	0.028	0.037	0.013			
c1	ed Fault Test: 120 VAC - Faultants-ti-	l Voltage Measurements (Water-to-De	ck) - VAC			
Distance from Water (ft)						
	Open Circuit	200 Ω Resistor	500 Ω Resistor 0.040			
1	0.030	0.029				
2	0.022	0.030	0.024			
3	0.027	0.028	0.023			
4	0.031 0.029	0.027	0.024			
5	0.029	0.054	0.022			
	Final Obcome	tions & Sign-Off				
Observations		humidity at time of test (10:00 AM) - Voltag	ge test done connected directly to pool			
Test Completed by:						
	Kristoffer Costa	Name:	John Antonelli			
Name:						
Name:	EMC Technician - IIA		VP - SunSmart Engineering			



### 8.3.10 Test Data, Pool #8, 1512 Pines End Pl, St Cloud, FL

	Pool Bonding & Equipot	ential voltage fest form			
		ORMATION			
Deal ID	Test Pool #8				
	1512 Pines End Pl, St Cloud, FL 34771				
I Type (Concrete/Fiberglass/Vinyl)					
ing Type (Wire Loop/Copper Grid)					
Date of Test					
		inSmart Engineering)			
	Kristoffer Costa (IIA), John Antonelli (SunSmart Engineering) Richard Moseley (Holland Pools)				
withessed by					
	CONTINUI	TY TESTING			
		TH GROUND ROD			
Location	1	2	3		
Description					
Bonding to Earth Ground (Ω)					
Location	TO EQUIPMI 1	ENT GROUND 2	3		
Description		Lighting J-box to Pump Lug	LightingTransformer to Pool Pane		
Bonding to Equip. Ground (Ω)		0.5	0.5		
Baseline	Equipotential Voltage Measurements	- POOL EQUIPMENT ON (Water-to-De	ck) - VAC		
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.015	0.006	0.004		
2	0.015	0.007	0.004		
3	0.037	0.008	0.010		
4	0.043	0.015	0.014		
5	0.037	0.012	0.009		
Baseline	Equipotential Voltage Measurements	- POOL EQUIPMENT OFF (Water-to-De	eck) - VAC		
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.012	0.012	0.005		
2	0.015	0.007	0.005		
3	0.017	0.010	0.006		
4	0.016	0.011	0.011		
5	0.017	0.009	0.009		
Simulat	ed Fault Test: 60 VAC - Equipotential	Voltage Measurements (Water-to-Dec	k) - VAC		
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.012	0.014	0.005		
2	0.016	0.015	0.008		
3	0.016	0.011	0.012		
4	0.021	0.010	0.009		
5	0.027	0.011	0.006		
		Voltage Measurements (Water-to-Dec			
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
1	0.012	0.012	0.007		
2	0.016	0.014	0.007		
3 4	0.016	0.015	0.008		
5	0.019 0.022	0.016	0.009		
5	0.022	0.020	0.006		
Simulat	ed Fault Test: 120 VAC - Equinotential	Voltage Measurements (Water-to-De	ck) - VAC		
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor		
	apen en edit				
1	0.022				
1	0.022	0.007	0.007		
2	0.030	0.007	0.007		
2 3	0.030	0.007 0.010 0.022	0.007 0.010 0.012		
2 3 4	0.030 0.046 0.052	0.007 0.010 0.022 0.038	0.007 0.010 0.012 0.015		
2 3	0.030	0.007 0.010 0.022	0.007 0.010 0.012		
2 3 4	0.030 0.046 0.052 0.046	0.007 0.010 0.022 0.038 0.044	0.007 0.010 0.012 0.015		
2 3 4	0.030 0.046 0.052 0.046 Final Observat	0.007 0.010 0.022 0.038	0.007 0.010 0.012 0.015 0.016		
2 3 4 5	0.030 0.046 0.052 0.046 <b>Final Observat</b> 15' x 30' pool - Weather: 72 F, 64% humid	0.007 0.010 0.022 0.038 0.044 ions & Sign-Off	0.007 0.010 0.012 0.015 0.016		
2 3 4 5 Observations	0.030 0.046 0.052 0.046 <b>Final Observat</b> 15' x 30' pool - Weather: 72 F, 64% humid	0.007 0.010 0.022 0.038 0.044 ions & Sign-Off	0.007 0.010 0.012 0.015 0.016		
2 3 4 5 Observations Test Completed by:	0.030 0.046 0.052 0.046 Final Observat 15' x 30' pool - Weather: 72 F, 64% humid wire at pump to remote earth rod	0.007 0.010 0.022 0.038 0.044 ions & Sign-Off ity at time of test (11:00 AM) - Voltage test	0.007 0.010 0.012 0.015 0.016		
2 3 4 5 Observations Test Completed by: Name:	0.030 0.046 0.052 0.046 <b>Final Observat</b> 15' x 30' pool - Weather: 72 F, 64% humid	0.007 0.010 0.022 0.038 0.044 ions & Sign-Off ty at time of test (11:00 AM) - Voltage test Name:	0.007 0.010 0.012 0.015 0.016 done connected from main bonding		
2 3 4 5 Observations Test Completed by: Name:	0.030 0.046 0.052 0.046 Final Observat 15'x 30' pool - Weather: 72 F, 64% humid wire at pump to remote earth rod Kristoffer Costa EMC Technician - IIA	0.007 0.010 0.022 0.038 0.044 ions & Sign-Off ty at time of test (11:00 AM) - Voltage test Name:	0.007 0.010 0.012 0.015 0.016		

Page 22 of 25



#### 8.3.11 Test Data, Pool #9, 590 Dinner St NE Palm Bay, FL

	Pool Bonding & Equipote	ntial Voltage Test Form		
	POOL INFO	RMATION		
Pool ID	Test Pool #9			
Location	590 Dinner St. NE, Palm Bay, FL 32907			
ol Type (Concrete/Fiberglass/Vinyl)	Paver deck			
ding Type (Wire Loop/Copper Grid)	Grid			
Date of Test	6/10/2025			
Tested By	Kristoffer Costa (IIA), John Antonelli (Sur	Smart Engineering)		
Witnessed By	Aqua Blue Pools			
	CONTINUIT			
	TO REMOTE EART			
Location		2	3	
Description				
Bonding to Earth Ground (Ω)				
	TO EQUIPME	NT GROUND		
Location	1	2	3	
Description	Heater to Pump	Pump to Cont	XFMR to cont	
Bonding to Equip. Ground (Ω)		0.1	0.3	
	Baseline Equipotential Voltage Mea	surements (Water-to-Deck) - VAC		
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor	
	0.007			
1		0.001	0.001	
2	0.016	0.003	0.001	
3	0.012	0.002	0.002	
4	0.008	0.003	0.002	
5	0.009	0.002	0.003	
Simula	ted Fault Test: 60 VAC - Equipotential V	oltage Measurements (Water-to-Decl	<) - VAC	
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor	
1	0.008	0.006	0.007	
2	0.008	0.003	0.009	
3	0.003	0.005	0.005	
4	0.029	0.007	0.019	
5	0.05	0.006	0.027	
Cimula		-H M	-) VAC	
Distance from Water (ft)	ted Fault Test: 90 VAC - Equipotential V Open Circuit	200 Ω Resistor		
			500 Ω Resistor	
1	0.01	0.005	0.005	
2	0.009	0.004	0.005	
3	0.018	0.007	0.016	
4	0.046	0.013	0.023	
5	0.082	0.019	0.031	
Simulat	ed Fault Test: 120 VAC - Equipotential \	oltage Measurements (Water-to-Dec	k) - VAC	
Distance from Water (ft)	Open Circuit	200 Ω Resistor	500 Ω Resistor	
1	0.01	0.005	0.008	
2	0.011	0.003	0.008	
3	0.011	0.002	0.014	
4	0.018	0.002	0.014	
5	0.06	0.002	0.019	
5	0.114	0.003	0.042	
	Final Observati	ons & Sign-Off		
Observations				
	89 Degrees F	ahrenheit, 57% Humidity. 12k Gallon free	eform pool	
Test Completed by:				
Name	Kristoffer Costa	Name:	John Anton	
Title		Title:	VP - SunSmart Engineeri	
Signature		Signature:		
Date		Date:	6/10/20	
Date	0/10/2025	Date:	0/10/20	



### 9. ANNEX-B – Test Setup Photographs

Test setup photographs are located in a separate document.

#### 10. History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
	1	Initial release	6/11/2025
TR_18836-25_Pool Bonding Test_			



END OF TEST REPORT

SunSmart Engineering Pool Bonding Test



