RIMKUS

2030 Powers Ferry Road SE, Suite 224
Atlanta, GA 30339
(770) 436-9399

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Report of Findings

Light Sport Aviators Drainage Evaluation
Style: Get Inspired Flight, Inc. et al v. David G. Cobb et al
State Court of Cherokee County Georgia Cause No. 21SCE0195

Rimkus Matter No: 100230555

Prepared For:
Light Sport Aviators, LLC
744 Noah Drive, Suite 133-120
Jasper, GA 30143

Attention:
Ms. Laura Thorburn-Gundlach

William P. Creeden, P.E.
Georgia Reg. Engineer No. 19634
Principal Consultant

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Section I
INTRODUCTION

Mr. David Cobb, from Joe Aircraft (Cobb), reported that an aircraft hangar constructed by Light Sport Aviators (LSA) in 2021 at the Pickens County Airport caused surface water to flow toward and flood his adjacent aircraft hangar. The Pickens County Airport and the subject hangars were located at 193 Pickens Airport Road in Jasper, Georgia.

Rimkus was retained to evaluate the construction of the LSA hangar and the causes of the reported flooding of the Cobb hangar. Our work to complete this assignment was performed by William P. Creeden, P.E.

This report was prepared for the exclusive use of Light Sport Aviators, LLC and was not intended for any other purpose. Our report was based on the information available to us at this time, as described in the **Basis of Report**. The opinions and conclusions herein are based on sufficient facts or data; they are the product of our analysis utilizing reliable, generally accepted principles and methods in our applicable professional field; and they reflect a reliable application of these principles and methods to the facts of this matter. Should additional information become available, we reserve the right to determine the impact, if any, the new information may have on our opinions and conclusions and to revise our opinions and conclusions if necessary and warranted. This report was reviewed by Mark A. Rhodes, P.E., Senior Practice Leader.

Section II
CONCLUSIONS

1. The LSA hangar was constructed substantially in accordance with the approved plans, and the construction of the hangar utilized usual and customary means to direct and control surface water around the building.

2. The surface water intrusion into the Cobb hangar was a long-term occurrence resulting from the lack of surface water control features in front of the Cobb hangar.

3. The construction of the LSA hangar did not cause the long-term surface water intrusion into the Cobb hangar; the conditions causing the water intrusion existed prior to the 2021 construction of the LSA hangar.

Section III
DISCUSSION

Background Information

The Cobb aircraft hangar was a steel-extruded, K-span-type structure (**Photograph 1 and Figure 1**). The LSA hangar was adjacent to the Cobb hangar and was a steel truss-framed structure (**Photograph 2 and Figure 1**). The buildings faced northeast; throughout this report, the front of the buildings were referenced to face east for ease of reference.

Figure 1 - 2021 aerial view of the hangars from NearMap. The Cobb hangar is marked with a white arrow, and the LSA hangar is marked with a red arrow.

General Observations

During the course of our October 6, 2023 inspection of the property, we observed the following:

- East of the hangars was a large, paved tarmac/aircraft parking area. The paved area sloped downward to the west, directing surface water flow toward the hangars (**Photographs 3 and 4**).

- In front of the LSA hangar was a concrete apron.

- The concrete apron sloped down from the hangar floor to the pavement approximately 2.2 inches (**Photograph 5**). The apron directed water flow from the pavement around both sides of the hangar.

- The LSA and Cobb hangars were approximately 8 feet apart. The westward surface water flow, diverted by the concrete apron, was directed to a drainage ditch between the hangars (**Photograph 6**). The drainage ditch had a constant slope to the west and discharged surface water west of the hangars (**Photographs 7 through 9**).

- A gutter with downspouts and buried extensions captured and transported roof runoff from the LSA hangar to the west (**Photograph 10**).

- The floor of the Cobb hangar was approximately 6.6 inches lower than the floor of the LSA hangar.

  - The floor of the Cobb hangar was approximately 4.4 inches lower than the edge of the paved tarmac (**Photograph 11**).

  - There was a concrete apron in front of the Cobb hangar that sloped down to a 4-inch-wide trench drain installed in the apron in front of the hangar (**Photographs 12 and 13**).

  - Similar to the LSA hangar, there was a trench between the Cobb hangar and the adjacent hangar to the south that carried surface water to the west (**Photograph 14**). A 4-inch polyvinyl chloride (PVC) drain pipe from the trench drain discharged into that ditch (**Photographs 15 and 16**).

  - The buried drain pipe from the north side of the trench drain was not visible.

Document Review

We reviewed construction plans for the LSA hangar by Letel Metrics dated October 22, 2020. We noted the following from the plans:

- The plans showed an existing building and concrete pad that was approximately half the size of the new LSA hangar to be removed.

- The planned spacing between the LSA and Cobb hangars was 7.8 feet.
- The grading and drainage plan showed that the east-to-west water flow was to be directed around both sides of the hangar and into ditches that conveyed the water west between the hangars.
- Based on our October 6, 2023 site observations, the LSA hangar was constructed substantially in accordance with the Letel plans.

We reviewed an affidavit and report by Mr. Greg Johnson, P.E., P.L.S., dated August 21, 2022, and noted the following:

- Mr. Johnson stated that the construction of the LSA hangar was responsible for an approximate 60-percent increase in the stormwater being diverted onto and into the Cobb hangar premises. The LSA hangar was approximately 2.5 inches higher than the tarmac pavement, causing water to be directed around both sides of the hangar.
- The existing drainage structure at the Cobb hangar (presumably referring to the trench drain) was inadequate to control the water flow toward the hangar.
- Mr. Johnson stated that the LSA hangar was 2.5 feet higher than the Cobb hangar.
- Mr. Johnson recommended installing a larger trench drain in front of the Cobb hangar with buried pipes to capture and convey stormwater around the hangar at an estimated cost of $36,000.

We reviewed various undated photographs and videos provided by Ms. Laura Thorburn-Gundlach, from LSA, and noted the following:

- Videos taken during rain events with dye added to the water runoff showed the runoff diverted around the LSA hangar running into the ditch and not the Cobb hangar (**Photographs 17 and 18**).
- Videos taken during rain events with dye added to the water runoff showed water running directly toward the Cobb hangar and accumulating against the door (**Photograph 19**).

- Multiple photographs and videos showed water accumulating over the top to the trench drain at the Cobb hangar (**Photographs 20 through 22**).

- Photographs showed the discharge pipe from the north side of the trench drain at the Cobb hangar to be full of mud and fully submerged in water (**Photograph 23**).

Analysis

The LSA hangar was constructed substantially in accordance with the approved plans. The hangar was sized and located in accordance with the plan, and the development of the site was substantially in accordance with the plan. When placing a building on a property, the planning of how surface water will be managed is one of the primary considerations for the designers. In scenarios where the pre-development grade directs surface water toward a planned building location, diverting that water around the building location is a usual and customary means to manage the surface water. The building has to be set at an elevation high enough to accomplish that water diversion. Consideration has to be given to how that diverted water may impact other structures or properties. In this case, the water was diverted to drainage ditches that conveyed the water away from adjacent structures. The Letel Metrics design met these important drainage considerations, and the hangar was constructed substantially in accordance with that design.

The floor of the Cobb hangar was approximately 4.4 inches lower than the tarmac pavement in front of the building. The concrete apron in front of that building sloped downward from the tarmac pavement to the building, and a significant amount of water runoff was directed directly against the building. This was an inherently problematic configuration. The elevations of the pavement, apron, and hangar floor relied exclusively on a trench drain installed in the apron to capture that water and convey it to the drainage ditches located north and south of the Cobb hangar. It was apparent that the trench drain was inadequate to manage the water that was coming off the tarmac. Additionally, photographs showed that the drain pipe from the north side of the trench drain was not maintained, which further diminished the capacity of the trench drain. The surface water intrusion into the Cobb hangar was a long-term occurrence resulting from the lack of surface water control features in front of the Cobb hangar.

Regarding the Johnson report, we agreed with aspects of his analysis. We agreed that the grade of the tarmac directed water toward the hangars, and we agreed that the existing trench drain outside the Cobb hangar was inadequate to control the water flow from the tarmac toward the hangar. We agreed that the trench drain and discharge conveyance should be improved after being designed by a qualified engineer. However, we disagreed that these conditions were caused by the construction of the LSA hangar. Mr. Johnson excluded significant facts from his analysis:

- The LSA hangar floor was not 2.5 feet higher than the Cobb hangar floor, it was only approximately 6.6 inches higher.

- There was an existing structure and concrete pavement at the location of the LSA hangar prior to its 2021 construction. Mr. Johnson provided no specifics as to how drainage in front of the Cobb hangar was altered by the construction of the LSA hangar.

- Mr. Johnson suggested that diverting surface water around a building was improper and yet doing so is a common and usual means to control surface water and is applied to the vast majority of new buildings being constructed. The Cobb hangar and the adjacent hanger to the south both did the same thing; they stopped the westerly water flow from the tarmac and diverted it around the buildings.

- Mr. Johnson suggested that the water flow diverted around the LSA hangar was directed toward the Cobb hangar. While it was true that the water was diverted in a south direction toward the Cobb hangar, it was then directed into the drainage ditch between the hangars before it reached the Cobb hangar. Mr. Johnson did not even mention the presence of the drainage ditch on the south side of the LSA hangar that was effectively managing the stormwater that was being diverted around the hangar. A similar condition existed on the south side of the Cobb hangar where a ditch was present between the adjacent hangar.

- Mr. Johnson provided no opinions or analysis of the adequacy of the trench drain before the LSA hangar was constructed. It was apparent just by observation that the drain was inadequate to handle the large volume of water from the tarmac.

The construction of the LSA hangar did not cause the long-term surface water intrusion into the Cobb hangar; the conditions causing the water intrusion existed prior to the 2021 construction of the LSA hangar.

Section IV
BASIS OF REPORT

1. An on-site inspection of the area of the hangars at the Pickens County Airport was performed by William P. Creeden, P.E., on October 6, 2023. During this inspection, measurements and photographs were taken.

2. We reviewed construction plans for the Light Sport Aviators hangar by Letel Metrics dated October 22, 2020.

3. We reviewed an affidavit and report by Mr. Greg Johnson, P.E., P.L.S., dated August 21, 2022.

4. We reviewed various undated photographs and videos provided by Ms. Laura Thorburn-Gundlach from Light Sport Aviators.

Section V
ATTACHMENTS

A. Photographs

B. Curriculum Vitae

Section V
ATTACHMENT A

Photographs

Photographs taken during our inspection, including photographs that were not included in this report, were retained in our files and are available to you upon request.

Photograph 1
Overview of the LSA hangar.

Photograph 2
Overview of the Cobb hangar.

Photograph 3
East of the hangars was a large, paved tarmac/aircraft parking area. The paved area sloped downward to the west, directing surface water flow toward the hangars.

Photograph 4
East of the hangars was a large, paved tarmac/aircraft parking area. The paved area sloped downward to the west, directing surface water flow toward the hangars.

Photograph 5
The concrete apron sloped down from the hangar floor to the pavement approximately 2.2 inches.

Photograph 6
The westward surface water flow, diverted by the concrete apron, was directed to a drainage ditch between the hangars.

Photograph 7
The drainage ditch had a constant slope to the west and discharged surface water west of the hangars.

Photograph 8
The drainage ditch had a constant slope to the west and discharged surface water west of the hangars.

Photograph 9
The drainage ditch had a constant slope to the west and discharged surface water west of the hangars.

Photograph 10
A gutter with downspouts and buried extensions captured and transported roof runoff from the LSA hangar to the west.

Photograph 11
The floor of the Cobb hangar was approximately 4.4 inches lower than the edge of the paved tarmac.

Photograph 12
There was a concrete apron in front of the Cobb hangar that sloped down to a 4-inch-wide trench drain installed in the apron in front of the hangar.

Photograph 13
There was a concrete apron in front of the Cobb hangar that sloped down to a 4-inch-wide trench drain installed in the apron in front of the hangar.

Photograph 14
Similar to the LSA hangar, there was a trench between the Cobb hangar and the adjacent hangar to the south that carried surface water to the west.

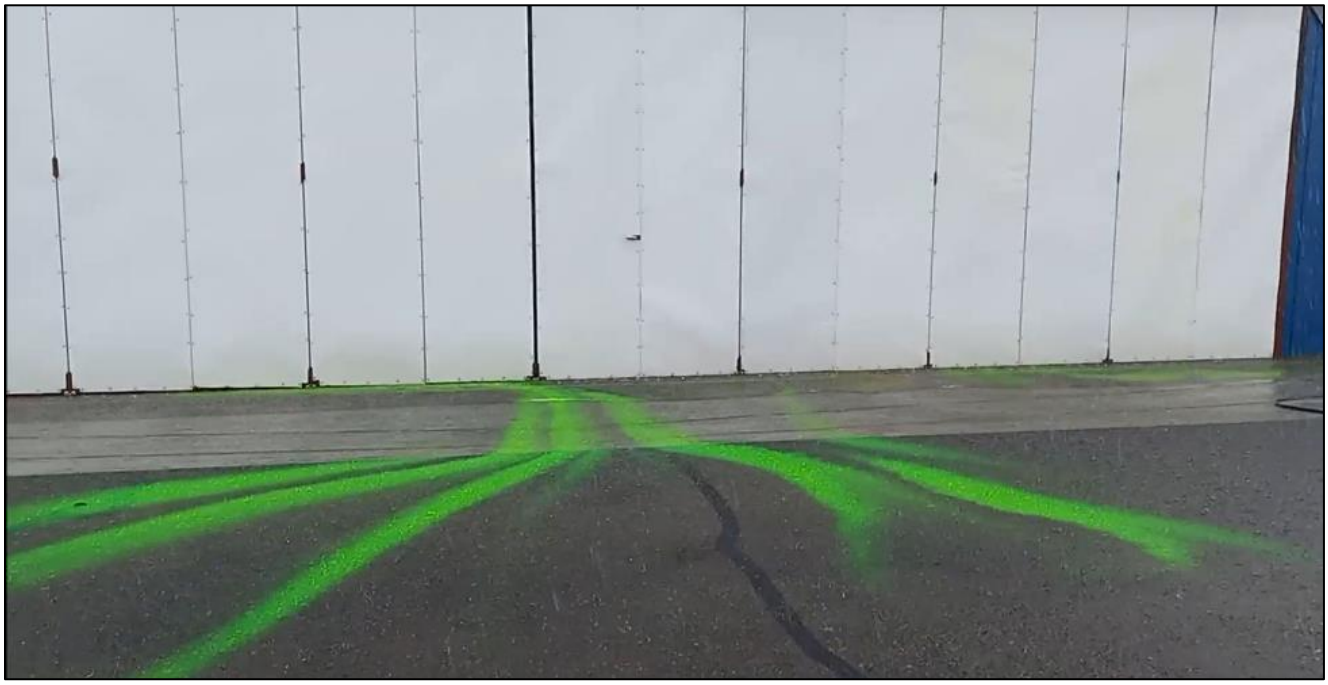
Photograph 15
A 4-inch PVC drain pipe from the south end of the trench drain discharged into that ditch.

Photograph 16
A 4-inch PVC drain pipe from the south end of the trench drain discharged into that ditch.

Photograph 17 – Provided by Ms. Laura Thorburn-Gundlach from LSA
Videos taken during rain events with dye added to the water runoff showed the runoff diverted around the LSA hangar running into the ditch and not the Cobb hangar.

Photograph 18 – Provided by Ms. Laura Thorburn-Gundlach from LSA
Videos taken during rain events with dye added to the water runoff showed the runoff diverted around the LSA hangar running into the ditch and not the Cobb hangar.

Photograph 19 – Provided by Ms. Laura Thorburn-Gundlach from LSA
Videos taken during rain events with dye added to the water runoff showed water running directly toward the Cobb hangar and accumulating against the door.



Photograph 20 – Provided by Ms. Laura Thorburn-Gundlach from LSA
Multiple photographs and videos showed water accumulating over the top to the trench drain at the Cobb hangar.

Photograph 21 – Provided by Ms. Laura Thorburn-Gundlach from LSA
Multiple photographs and videos showed water accumulating over the top to the trench drain at the Cobb hangar.

Photograph 22 – Provided by Ms. Laura Thorburn-Gundlach from LSA
Multiple photographs and videos showed water accumulating over the top to the trench drain at the Cobb hangar.

Photograph 23 – Provided by Ms. Laura Thorburn-Gundlach from LSA
Photographs showed the discharge pipe from the north side of the trench drain at the Cobb hangar to be full of mud and fully submerged in water.

Section V

ATTACHMENT B

Curriculum Vitae

William P. Creeden, P.E.

Principal Consultant

2030 Powers Ferry Road, Suite 224
Atlanta, GA 30339

(470) 349-9857

wcreeden@rimkus.com

Background

Mr. William Creeden obtained his bachelor's degree in civil engineering from the United States Military Academy at West Point and is a registered professional engineer. Mr. Creeden began his professional career as a commissioned Army officer in the Corps of Engineers, and subsequently performed construction management on a variety of industrial, residential, and commercial construction projects in both the public and private sectors. For the last 15 years, Mr. Creeden has investigated and analyzed failures in civil/structural engineering disciplines related to residential, commercial, municipal, and industrial buildings. He has performed thousands of evaluations following various natural disasters including hurricanes, earthquakes, tornados, and snow accumulation, as well as hail and wind events. Mr. Creeden has analyzed and provided expert testimony regarding many complex construction defect cases.

Forensic Engagements

- **Select Forensic Engagements**
  - Performed hundreds of damage assessments from hurricanes, including Gustav, Irene, Isaac, Sandy, Matthew, Irma, Florence, and Michael.
  - Performed evaluations of more than $100 million of school buildings after the 2011 earthquake in southern Virginia.
  - Performed hundreds of structural and water intrusion evaluations to buildings in New England after the record snow accumulations in both 2011 and 2015.
  - Evaluated more than 5,000 apartment units in the Atlanta area following a 2009 storm event.
  - Evaluated structural damage resulting from tornados or severe wind in more than 20 states.
  - Evaluated many claims of damage from construction vibrations.
  - Evaluated hundreds of buildings for structural damage resulting from vehicle impacts.
  - Provided continuing education to insurance professionals on tornado damage assessment, wind vs. surge, construction vibrations, thermal imaging, roof construction, roof damage, construction claims and disputes, duration of moisture exposure, premise liability, and the California earthquake certification.

- **Provided expert testimony regarding:**
  - Various construction defects, including roofs, framing, wall assemblies, grading and drainage, foundations, finishes, and incomplete work.
  - Extent of damage to buildings resulting from catastrophic events.

- Balcony waterproofing and construction.
- Erosion of soil from worksites and sedimentation into state waters.
- Swimming pool design and construction.
- Construction accidents including falls and rigging failures.
- Causes of damage and costs to repair.

Professional Experience

- **Rimkus** **2010 – Present**
  - Principal Consultant
    Investigates and analyzes failures in civil/structural engineering disciplines related to residential, commercial, municipal, and industrial buildings. Investigate moisture intrusion, foundation failures, structural deficiencies and failures, stormwater runoff, drainage problems, roof damage, and storm damage. Provides expert consultation and testimony regarding construction defects and claims.

- **Highland Al Hujaz Co** **2009**
  - Project Director - Construction of ANA Corps Facilities, Kandahar, Afghanistan
    Managed a $38 million design/build Corps of Engineers project outside of Kandahar Airfield in Afghanistan, constructing new Corps Support Battalion facilities for the Afghan Army.

- **KBC Constructors, LLC** **2000 – 2008**
  - Partner
    Builder/Developer constructing quality developments and homes throughout Atlanta, including the $27 million redevelopment of Lynwood Park.

- **Property Engineering** **1999 – 2008**
  - President/Owner
    Provided design and forensic engineering services to Architects, Builders, Owners, Lenders, and Law Firms in a variety of light commercial and residential projects.

- **WATEC** **1991 – 1999**
  - Project Manager
    Design/Build Contractor, constructing industrial water treatment plants throughout the eastern United States.

- **US Army Corps of Engineers** **1986 – 1991**
  - Active Duty Commissioned Officer
    Combat Engineer 21J. Positions held: General Construction Platoon Leader, Earthmoving Platoon Leader, Construction Executive Officer, and Trainer, US Army Engineer School.

Education and Certifications

- **Civil Engineering, B.S.:** United States Military Academy, West Point (1986)
- **Licensed Professional Engineer:** Alabama, Florida, Georgia, Louisiana, and Mississippi