VDC MANAGER'S APPROACH TO STAYING IN THEIR LANE WHILE TAKING TO THE SKIES

CS324046
November 20th, 2019
10:30-11:30 AM
About the speaker

**Joel Jacobson**  
Senior Integrated Construction Manager

Joel spent his early professional career managing BIM implementation for premier architecture firms in and around the Chicagoland area. Since joining Mortenson, Joel has successfully managed VDC on numerous projects spanning multiple market sectors and regions. Joel is currently working with Mortenson’s Sports + Entertainment Group on the future home of the NFL Raiders in Las Vegas, NV.

**Mortenson VDC**

For over 20 years, our team has helped pioneer the use of Building Information Models (BIM) and Virtual Design and Construction (VDC) in all phases, from preconstruction through operations and maintenance. Mortenson’s culture of embracing innovation gives fuel to our team of 60+ VDC experts spread across our project’s, striving towards continuous improvement in areas that make the greatest impact to our customers.
About the other speaker

Dustin Williams
CEO & Founder - FlywheelAEC

Dustin is a highly creative and innovative leader specializing in BIM/VDC and Reality Capture via Drones and Laser Scanning. He has over a decade of engineering and VDC experience working from concept through construction on a broad range of residential, commercial, institutional, and mixed-use projects. Dustin is hands on team leader and Flywheel’s client interface.

The Flywheel Team

The Flywheel team is comprised of industry experts each with over a decade of experience in the AEC industry.

Their talents and expertise include leading edge software applications for BIM workflows, laser scanning, drones. The team also includes a LEED AP, a PLS and FAA certified drone pilots etc.

E: dustinw@flywheelaec.com
The Las Vegas Stadium will provide a world-class home for the NFL Raiders upon the team’s relocation in 2020. The Mortenson|McCarthy joint venture team is currently building the $1.9 billion domed stadium. To overcome the aggressive schedule, scale and complexity the project is supported by a culture that fosters an innovative approach to implementing advanced technology, processes and lean construction methodology. In this session Joel Jacobson, and his 3+ years of managing Drone deployment on large-scale Mortenson projects, will share his unique approach to partnering with industry experts such as Dustin Williams of FlywheelAEC to deliver enhanced project awareness and improved communication across the entire Las Vegas Stadium project team. Joel and Dustin will share and discuss best practices, future outlook observed within the industry, and will demonstrate the lessons learned and data visualizations produced as a result of effective planning and coordination.

**Learning Objective 1**
Navigate the current trends and regulations that impact the planning and early deployment of UAVs on Mortenson projects.

**Learning Objective 2**
Identify the opportunities and benefits when partnering with outside experts in the field of UAV piloting and data delivery.

**Learning Objective 3**
Experience a VDC Manager’s unique approach to outsourcing drone deployment in order to focus on data access & visualizations.

**Learning Objective 4**
Witness the preparation, delivery and consumption of the drone data outputs utilized on a complex and large-scale project.
AUDIENCE POLL

- How many are using drones as a tool?
- How many are using RTK/PPK?
The Big Why

- Schedule
- Scale
- Transparency
- Efficiency
- Practical and Usable
- Sustainable
- Dedicated
Problem/Obstacles

POLICIES

- Mortenson
  - Experience
  - Insurance
  - Sentiment
- Unpermitted Flights
- Internal Buy-in and Perception
Problem/Obstacles
Policies

- FAA
  - Part 107
  - Controlled Class B Airspace
    - Less than a mile from McCarran International Airport and Strip
    - Eighth busiest airport - about 1700 flights daily
      - about 100 per hour
    - 0' elevation grid
    - Worked constantly with tower and FAA to obtain and maintain approvals
  - Proximity to major highway and the Las Vegas Strip
    - Hardware and Software
Solution

- Scope of Work
  - Existing
  - Routine
  - Unique Use Cases
    - Earthwork (full site and targeted)
    - marketing video for owner
**Still Aerial Images**

8 images pre-programmed to be taken at a specific location and heading and camera angle.

**Aerial Video Footage**

Several minute video orbiting around the perimeter of the project.
Nadir Aerial Photogrammetry

- Orthomosaic Map
- Point Cloud Model
- PDF Overlay

Enclosure Oblique Aerial Photogrammetry

- Point Cloud Model
- Inspection Images placed on a map
PIX4D

All hosted in the cloud

PROCORE
Flywheel Weekly Process

Processing Workflow

1. Capture data with GCP’s
2. Transfer data
3. Process and Post Still Images
4. Process and Post Video
5. Translate results to project coordinates
6. Process Photogrammetry
7. Process RTK/PPK information
8. Process and Post Inspection Images
9. Spatially thin point cloud
10. Create DSM & convert LAS to RCP
11. Post Orthomosaic and Point Cloud
12. Create Ground Surface Model with Contours
13. Create and Post PDF Overlay
14. Notify stakeholders
# Software Used on the Project

<table>
<thead>
<tr>
<th>Software Used</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>AUTODESK CIVIL 3D</strong></td>
<td>Design Software for Surface Creation, Analysis, Reporting, and Visualization</td>
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<tr>
<td><strong>GLOBAL Mapper</strong></td>
<td>Data Conditioning</td>
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<tr>
<td><strong>AUTODESK RECAP</strong></td>
<td>Data Visualization, Engine</td>
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<tr>
<td><strong>VIRTUAL SURVEYOR</strong></td>
<td>Data Extraction</td>
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<tr>
<td><strong>SKYCATCH + PIX4D</strong></td>
<td>Data Processing</td>
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<tr>
<td><strong>PROPELLER</strong></td>
<td>Data Processing</td>
</tr>
<tr>
<td><strong>INFRAWORKS</strong></td>
<td>Preliminary Design, Visualization &amp; Data Extraction</td>
</tr>
<tr>
<td><strong>CLOUD COMPARE</strong></td>
<td>Open Freeware for Point Cloud Viewing and Manipulation</td>
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</tbody>
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Benefits

GENERAL CONTRACTOR
Why is it beneficial to outsource rather self-perform.

FLYWHEELAEIC
• Dedicated personnel
• Experienced pilots
• Processing technicians
• Specialized software and computers

Stats

100+ Missions Flown
50M Points in the raw
2 Terabytes of Data
Question & Answer
Contact Us

Telephone
Main: (831) 440-8380
Dustin: (831) 440-8384

Admin Address
Flywheel AEC Consulting, Inc
548 Market St #68589
San Francisco, CA 94107-5401

Website
http://flywheelaec.com