



FIG WORKING WEEK 2023

28 May - 1 June 2023 Orlando Florida USA

Protecting
Our World,
Conquering
New Frontiers

Mobile Mapping a F1 Race Track



Russell Hall, PLS
Langan Engineering



Organized By



Diamond Sponsors

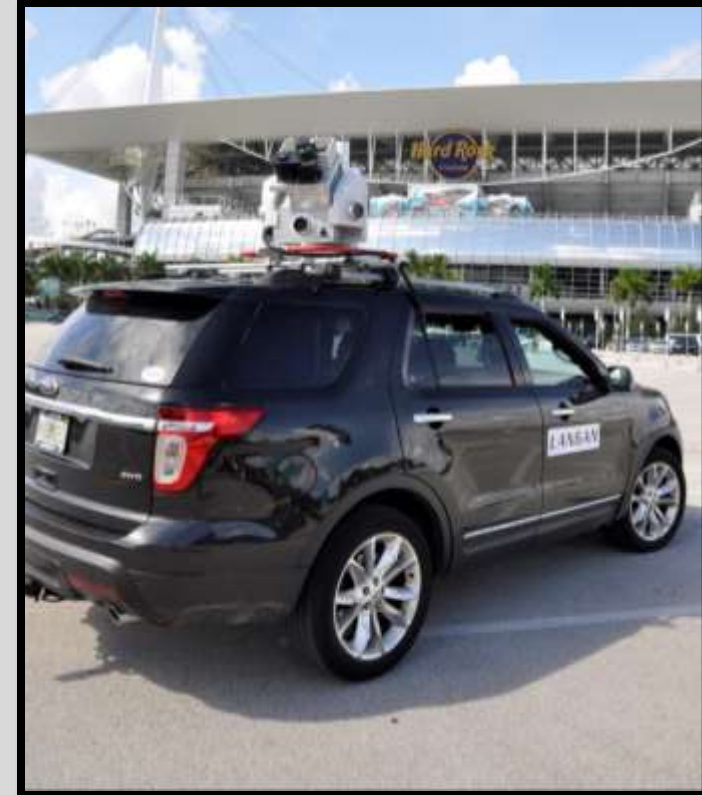


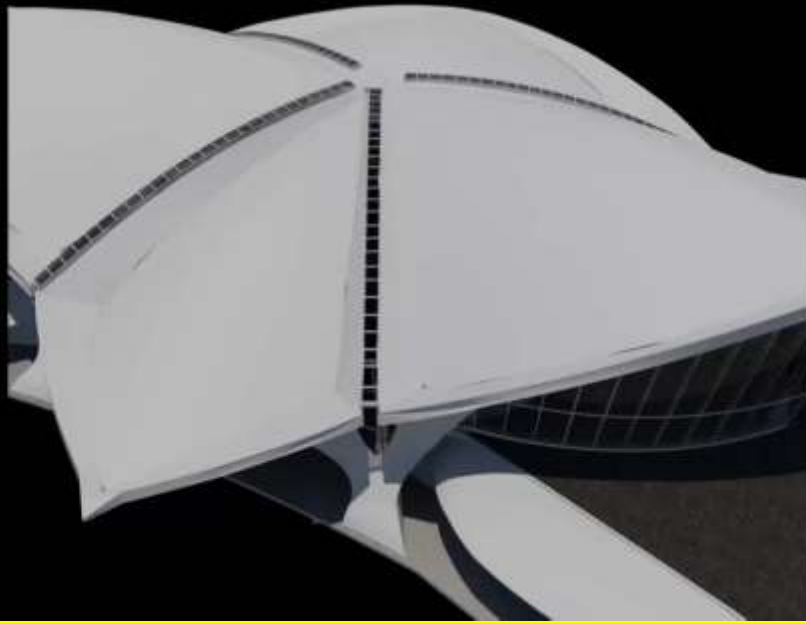
Langan Mobile Mapping



Capturing the Picture

At ***SPEED!***





Technical Excellence

Practical Experience

Client Responsiveness

LANGAN

Integrated Solutions: One-Stop Shop

Site + Civil * Geotechnical * Environmental * Surveying + Mapping + GIS
Traffic + Transportation * Landscape Architecture + Planning *
Natural Resources + Permitting * Sustainable Design
3D Laser Scanning + BIM Support



Technical Excellence

Practical Experience

Client Responsiveness

LANGAN

Nationwide Footprint. International Reach.

Miami, FL
Fort Lauderdale, FL
Tampa, FL
Orlando, FL
West Palm Beach, FL
Parsippany, NJ
New York, NY
White Plains, NY
New Haven, CT
Lawrenceville, NJ
Philadelphia, PA
Doylestown, PA
Bethlehem, PA
Pittsburgh, PA
Bridgeport, WV
Cleveland, OH
Washington, DC
Arlington, VA



San Francisco, CA
Oakland, CA
San Jose, CA
Sacramento, CA
Los Angeles, CA
Santa Barbara, CA
Irvine, CA
Houston, TX
Denver, CO
Phoenix, AZ
Abu Dhabi, UAE
Athens, Greece
Doha, Qatar
Dubai, UAE
London, United Kingdom
Panama City, Panama

What is it?



System Configuration



What is it?

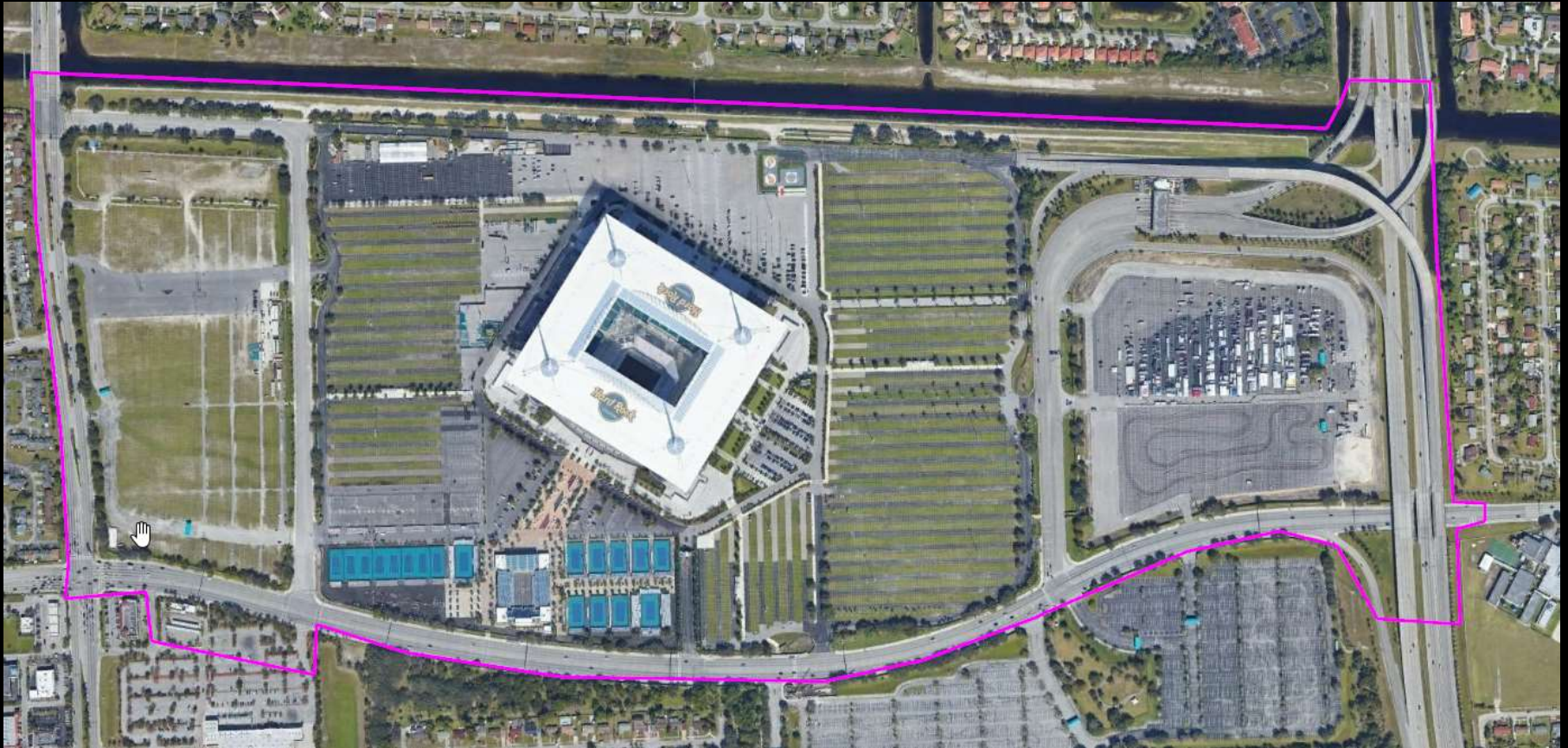
1,000,000 pps

Traveling at local vehicle speed

0.020 m RMS accuracy (no control)

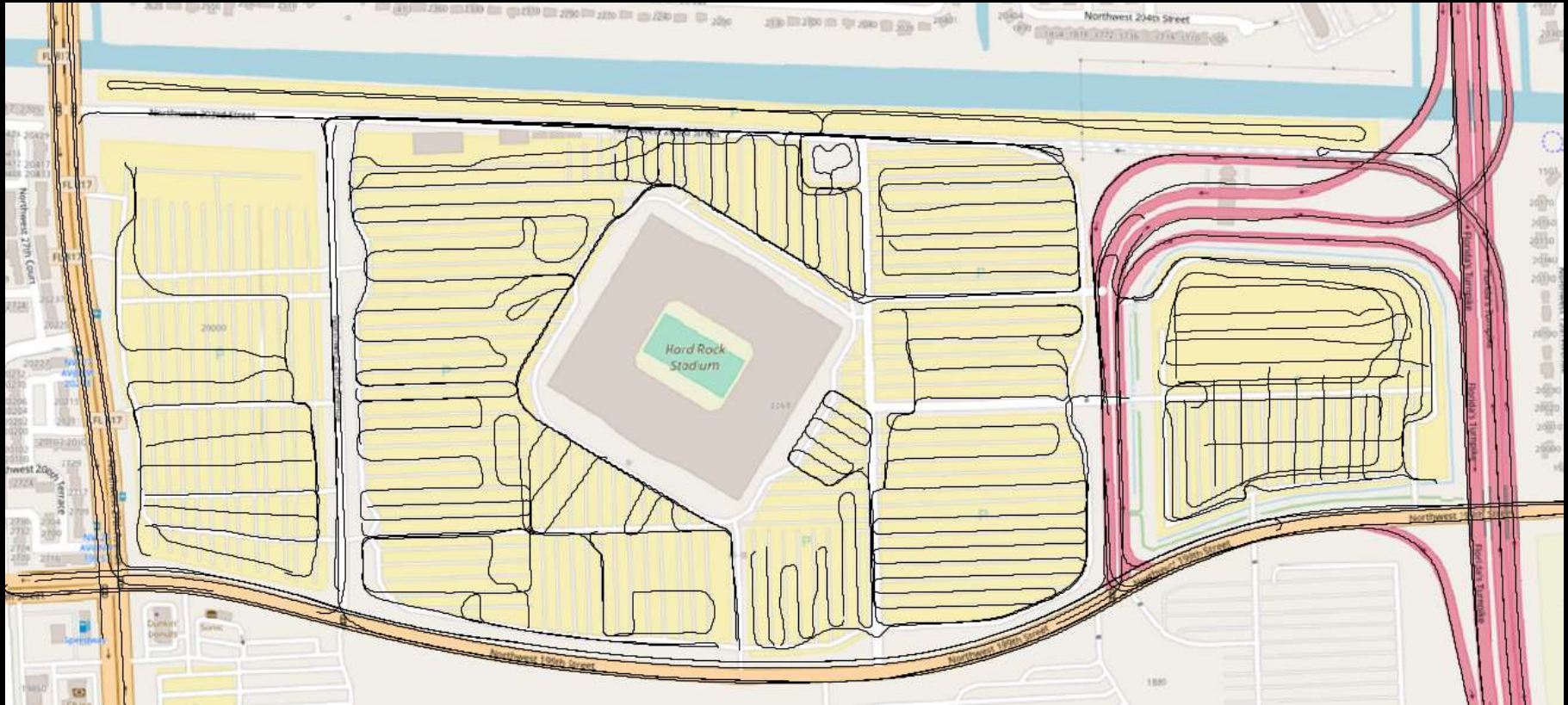
1.1 GB of data/km

Collecting The Data



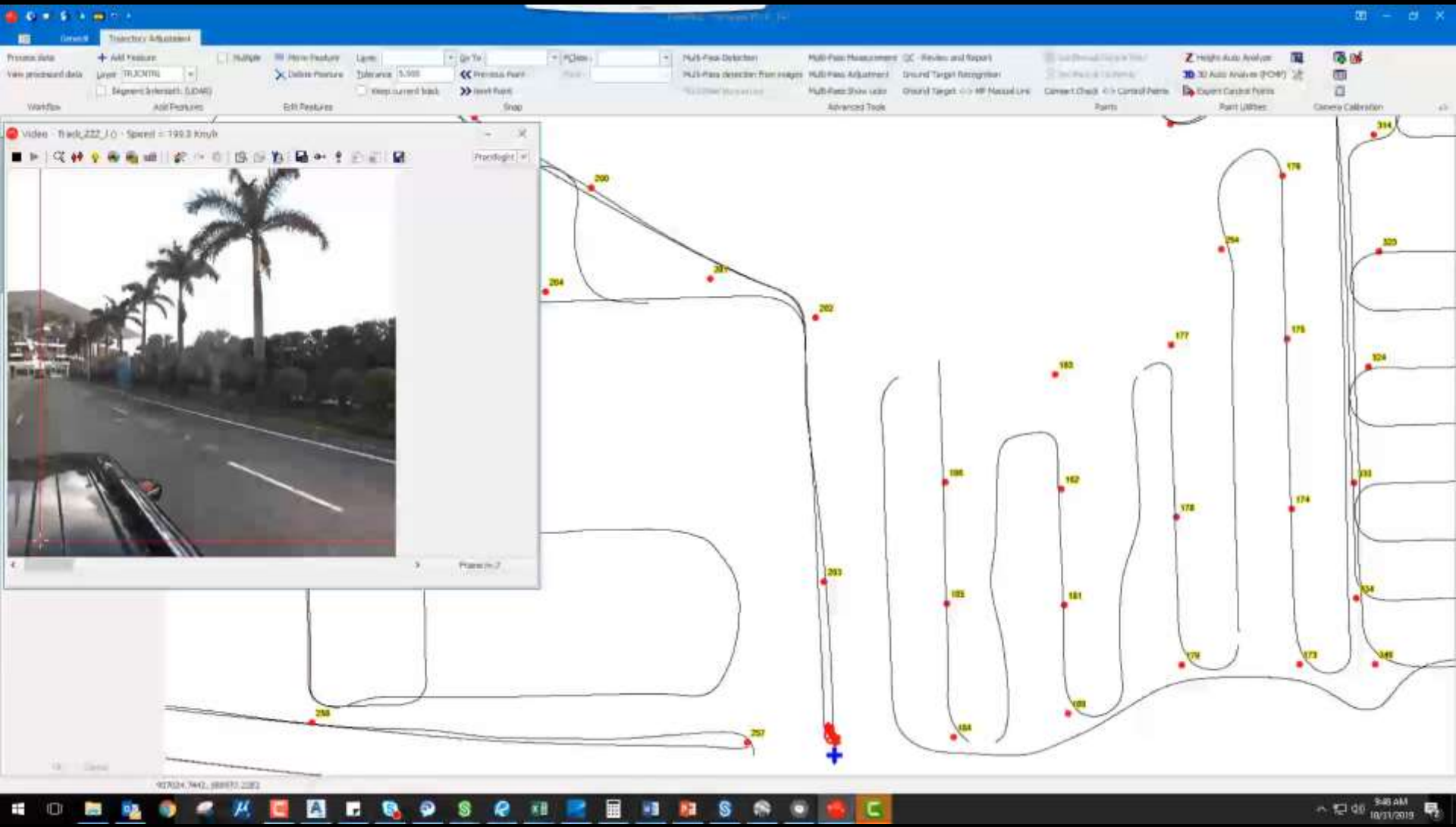
Hard Rock Stadium

Driving The Site

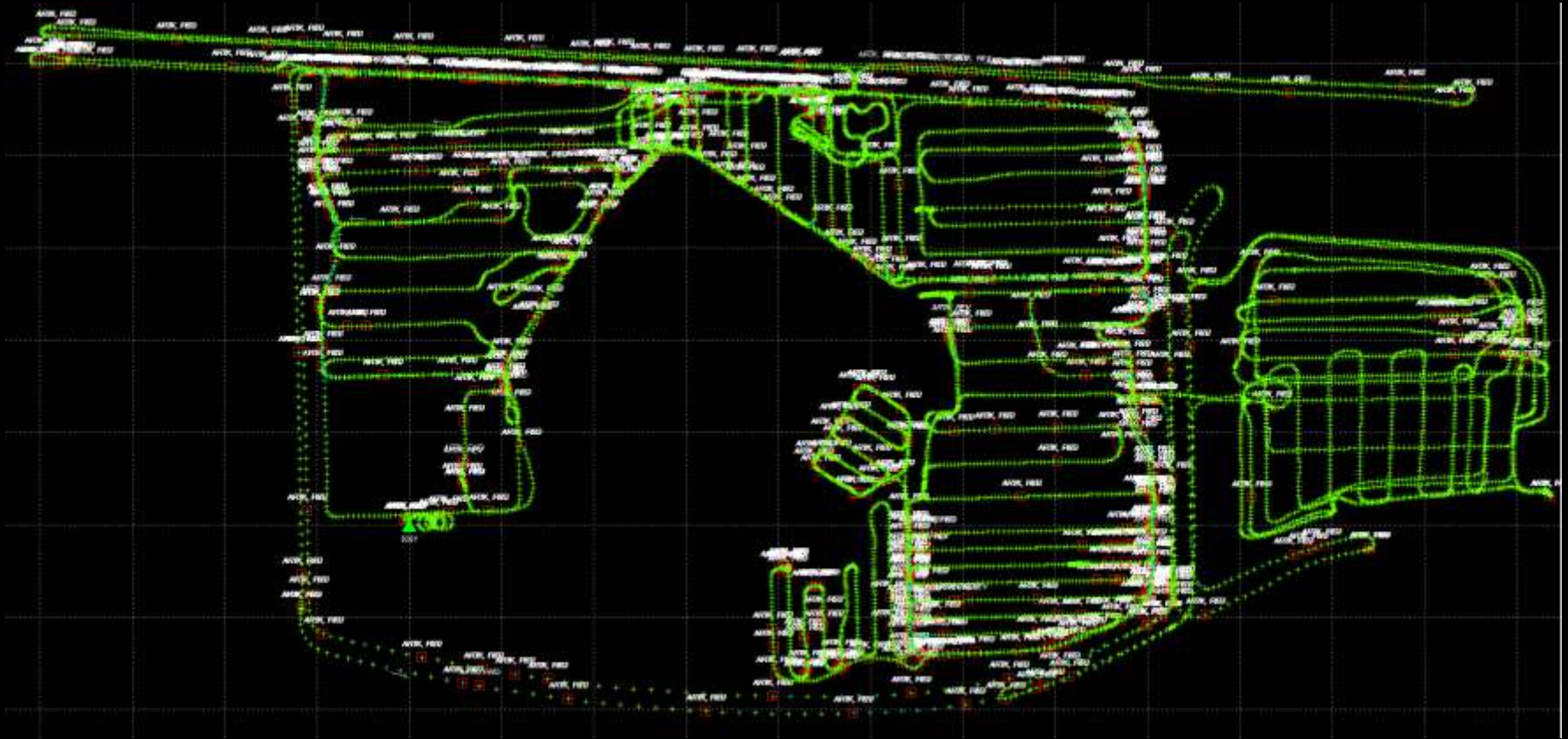


Hard Rock Stadium

Driving The Site

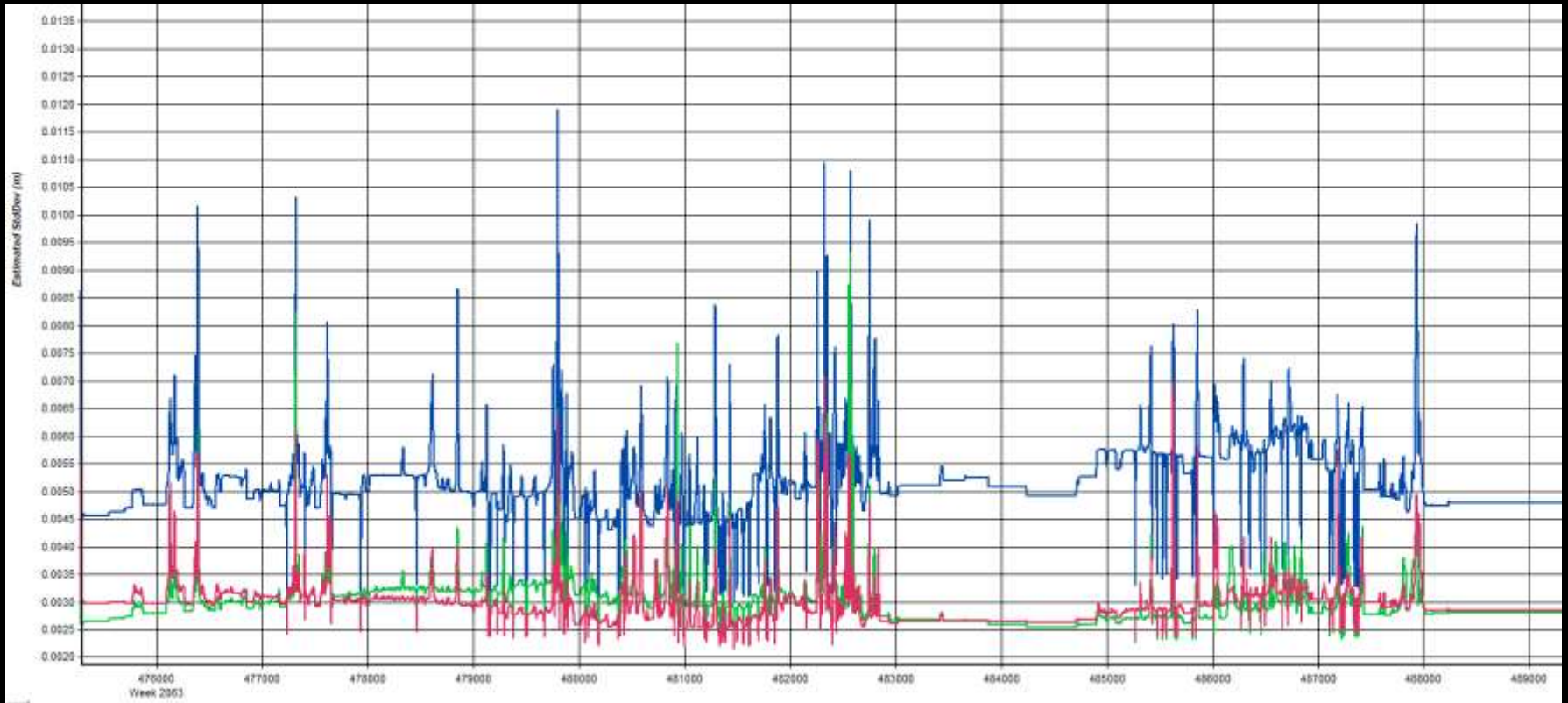


Processing The Data



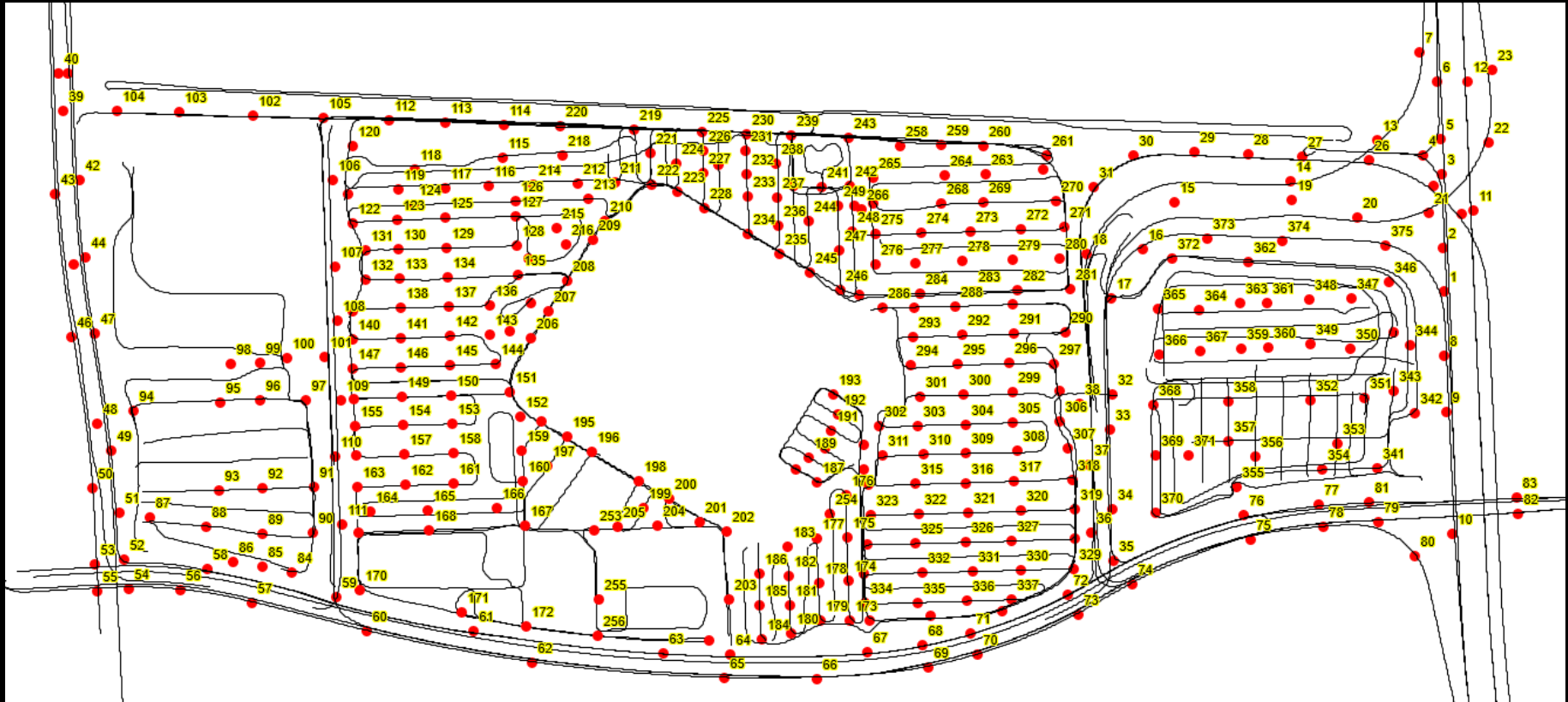
Inertial Explorer

Processing The Data



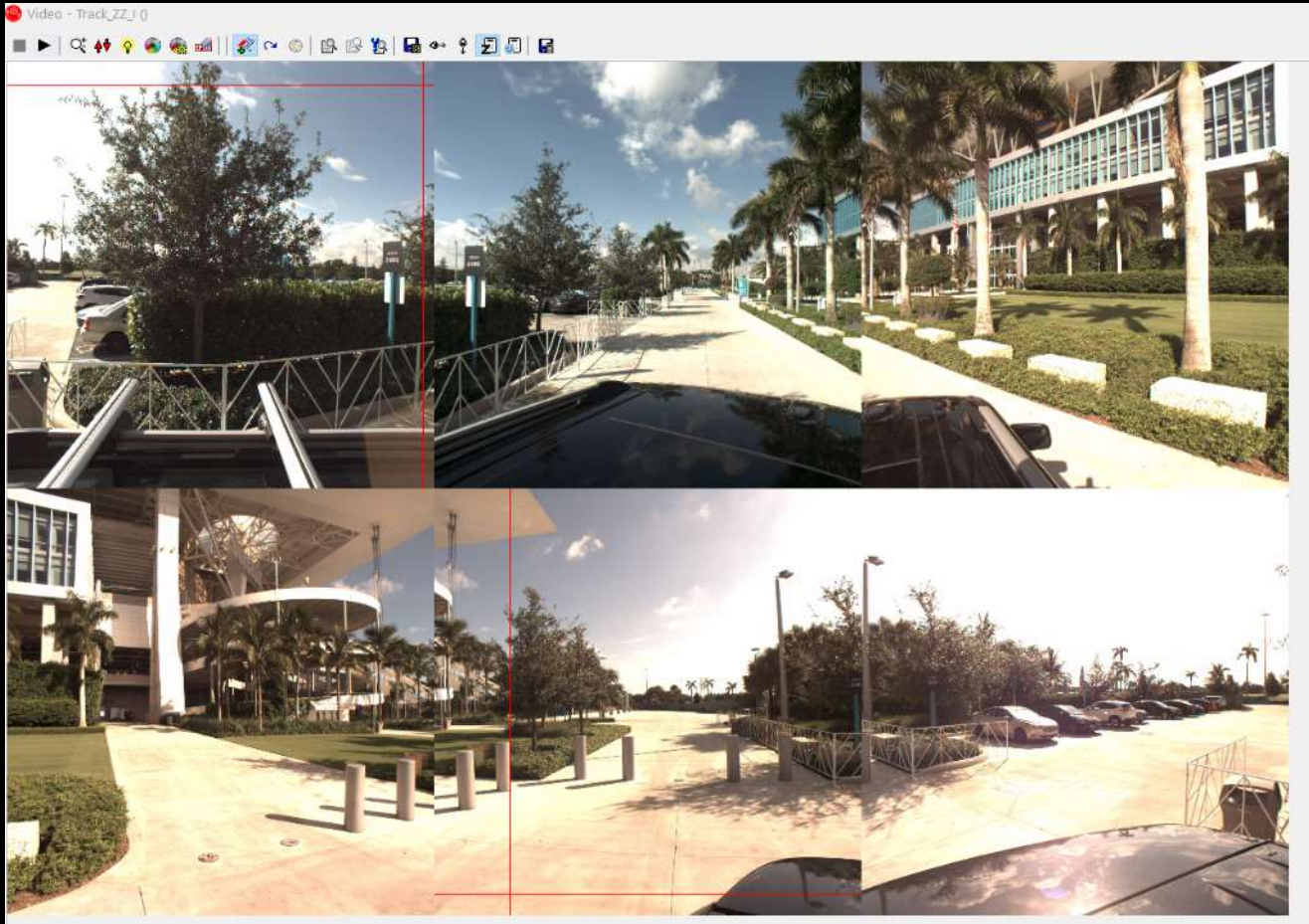
Initial QA

Processing The Data



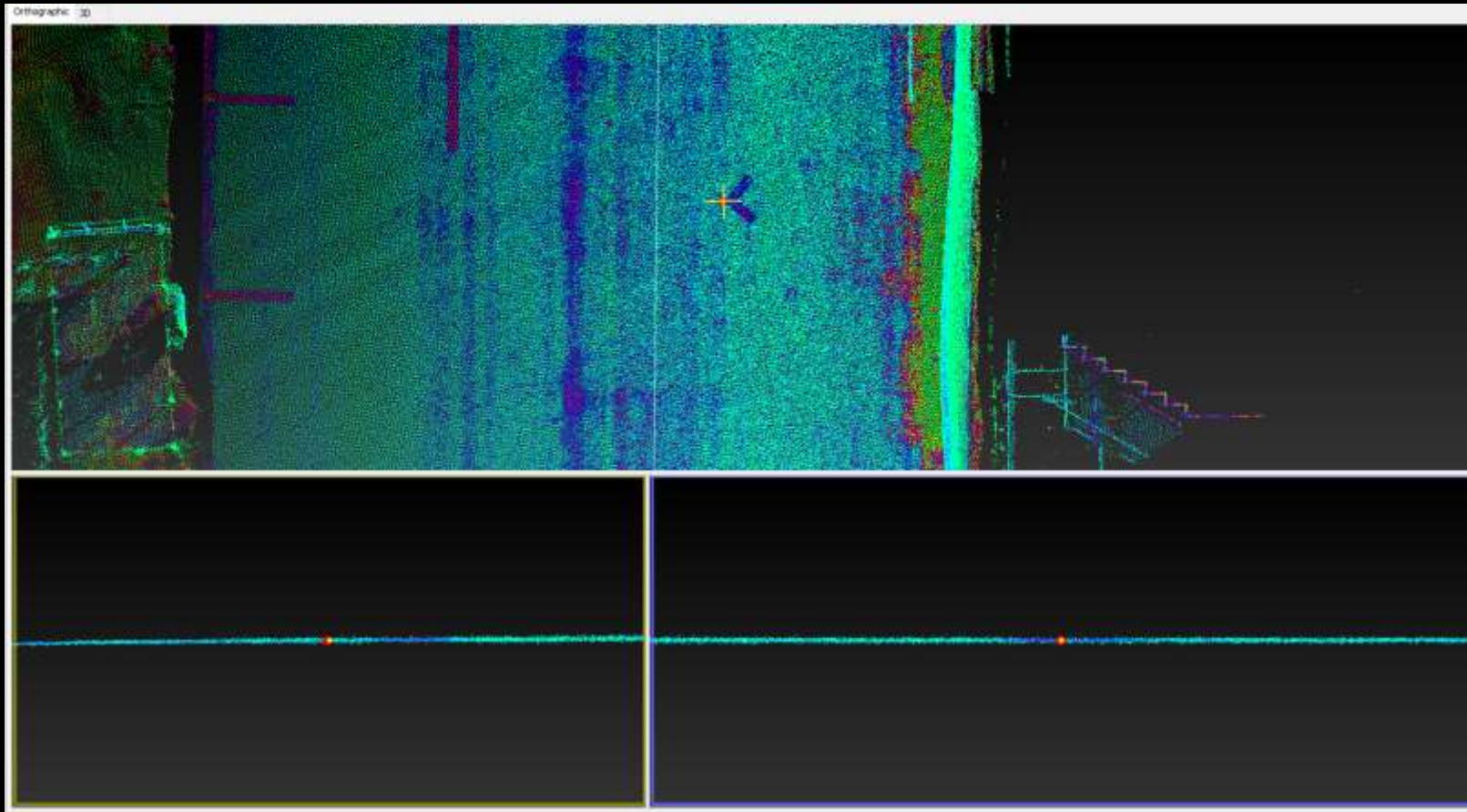
Locating Control Points

Collecting The Data



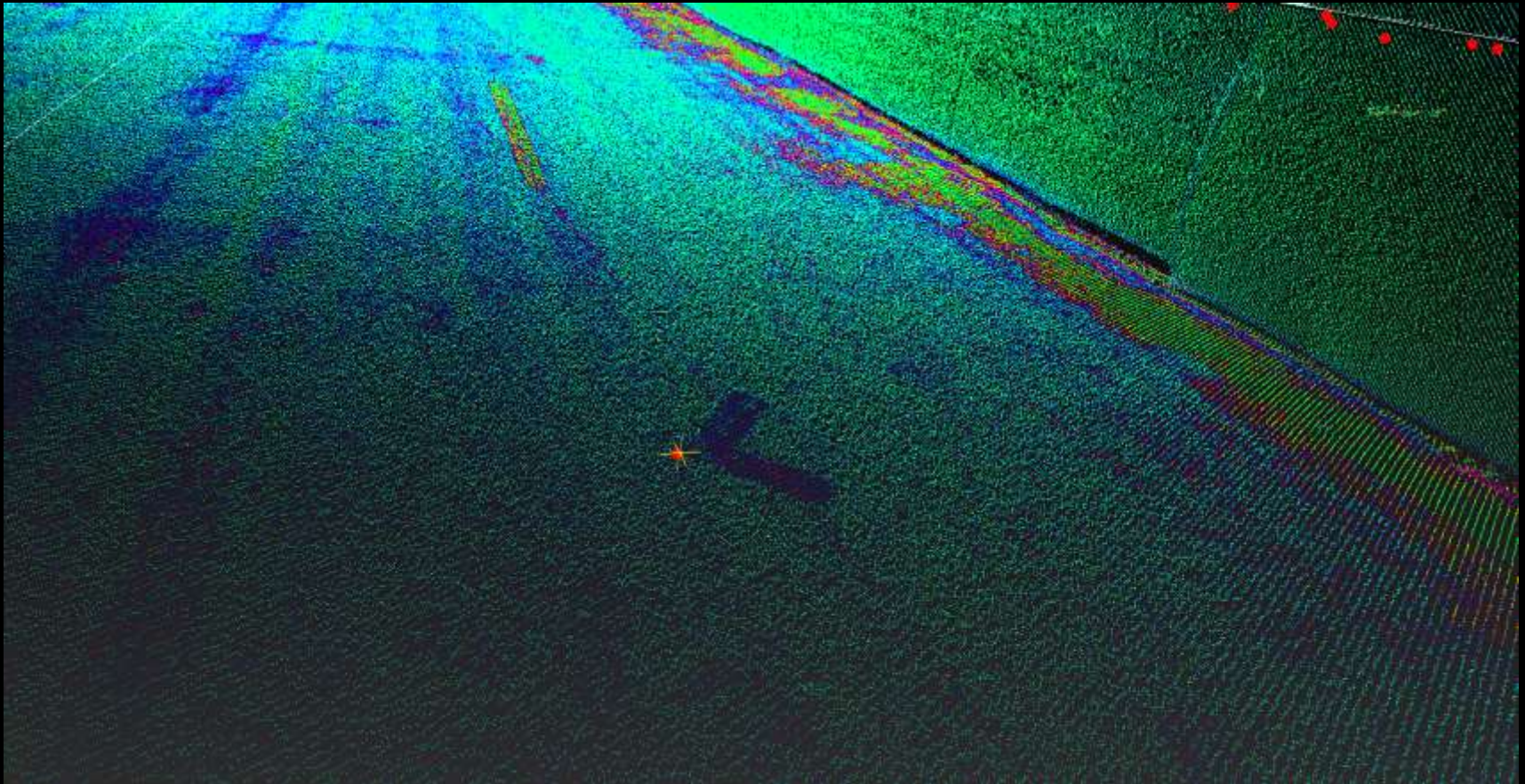
Locating Control Points

Collecting The Data



Locating Control Points

Collecting The Data



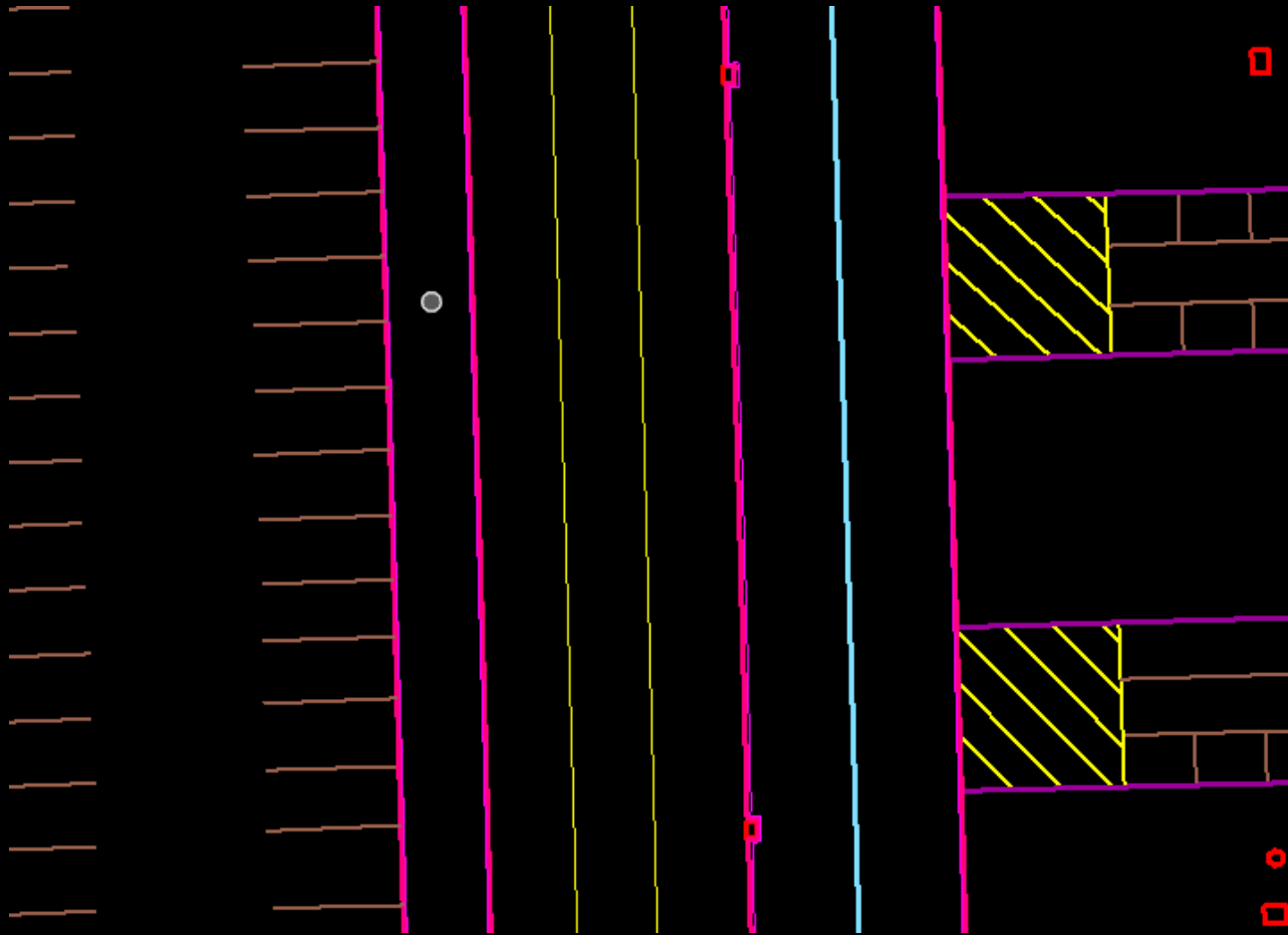
Locating Control Points

Extracting The Data



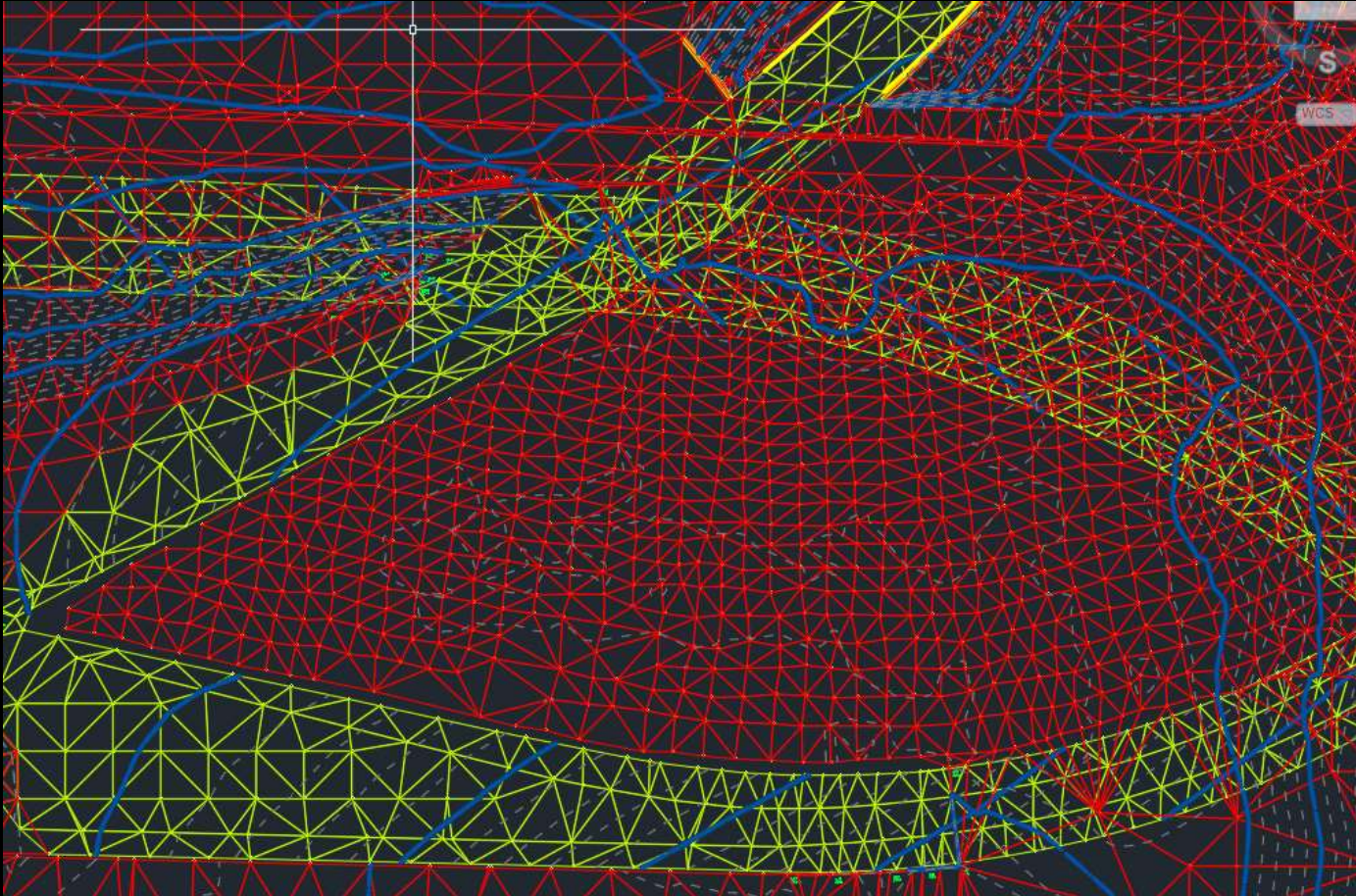
Placing 3D Features On The Cloud

Collecting The Data



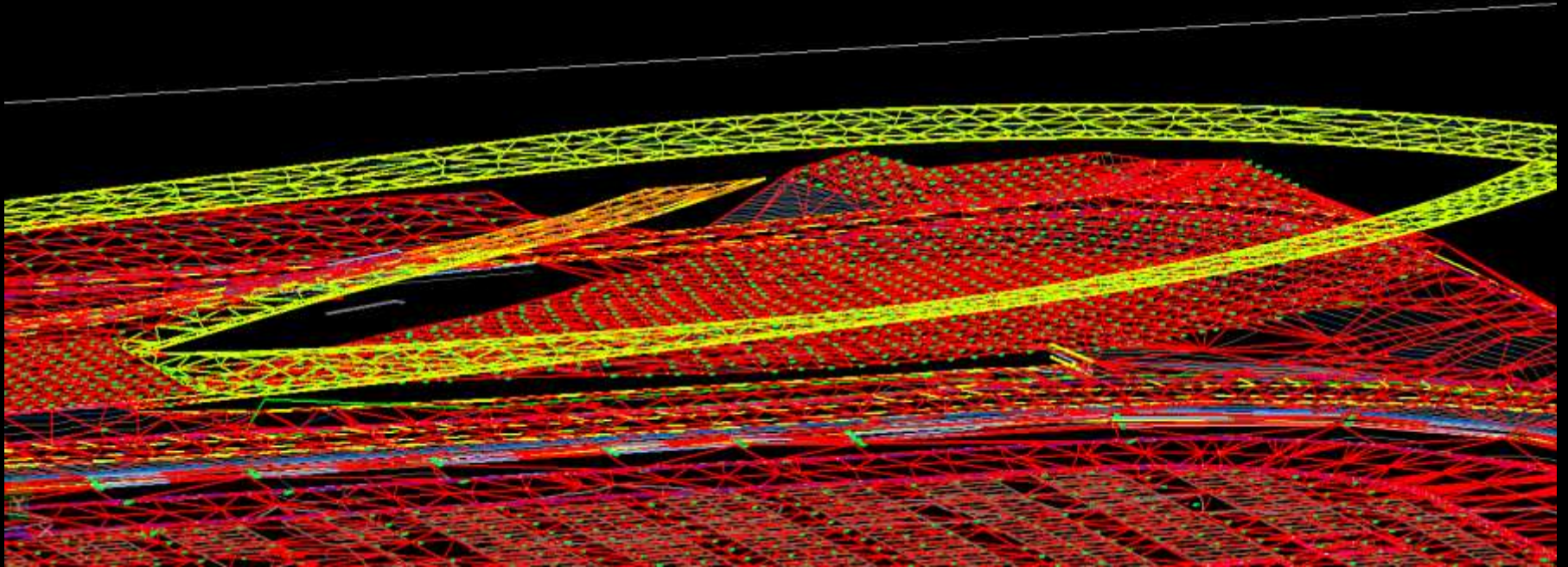
Placing 3D Features On The Cloud

Collecting The Data



Building The DTM

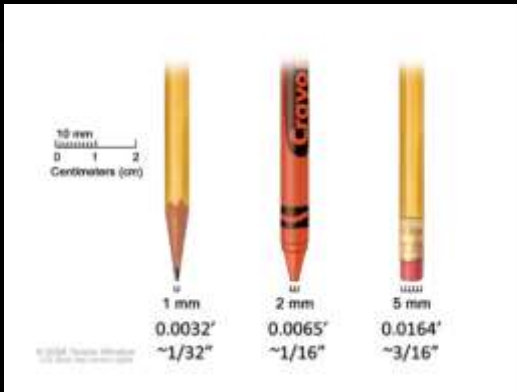
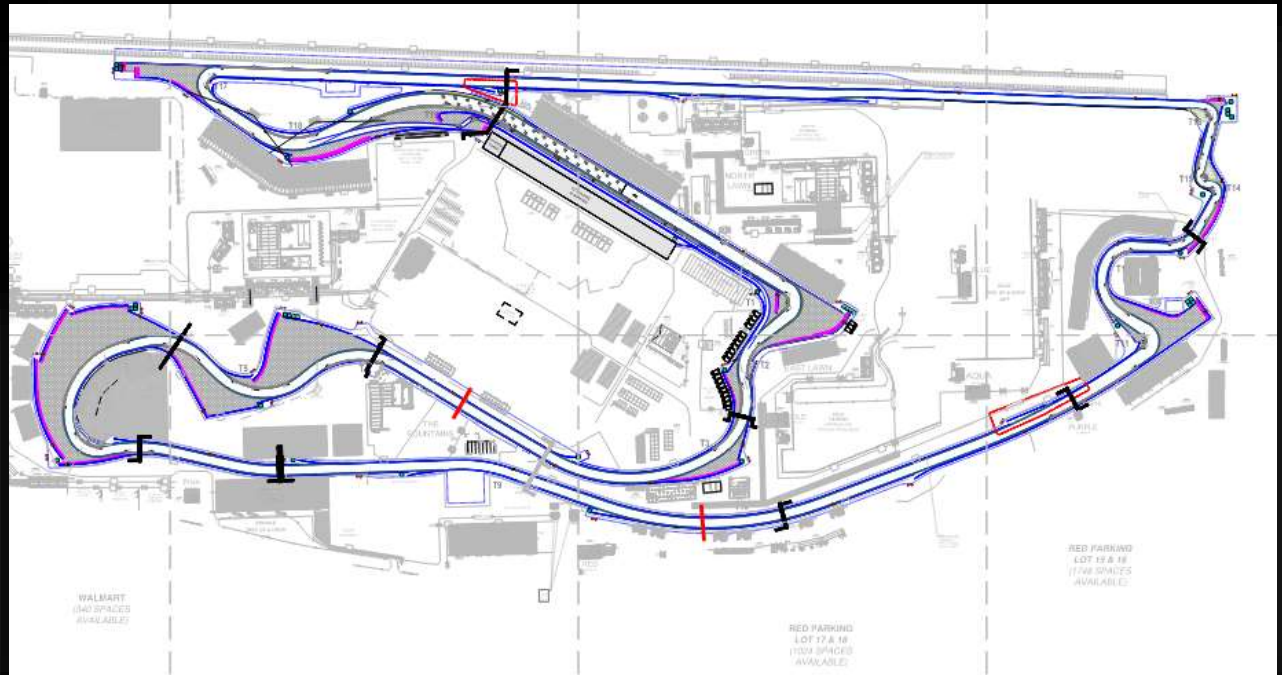
Collecting The Data



Building The DTM

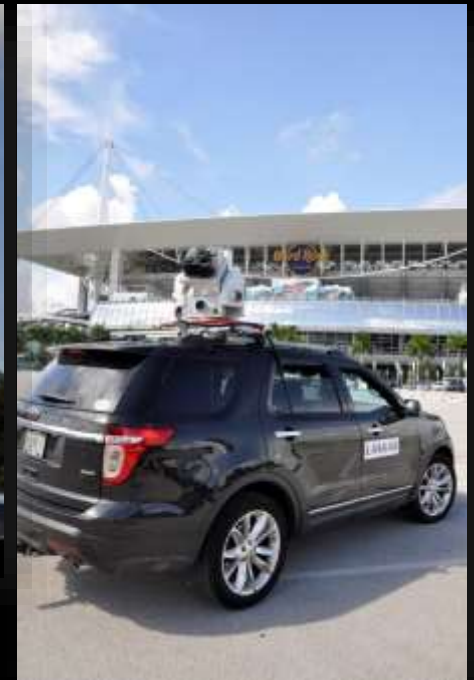
SURVEY

- New Survey (2022)
- High Accuracy

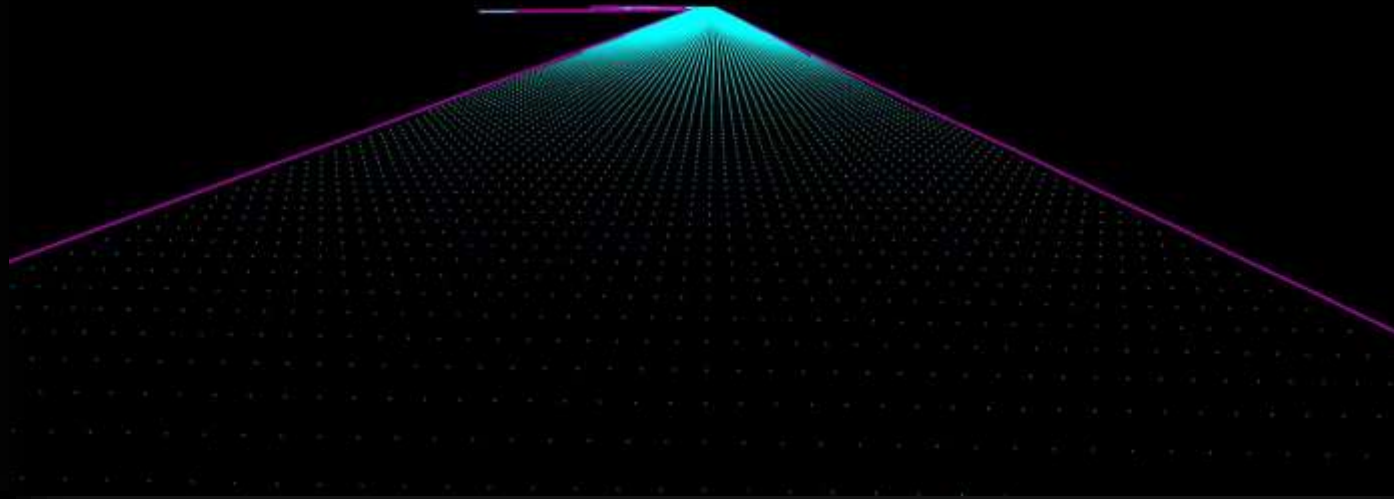


SURVEY

- New Survey (2022)
- High Accuracy
 - +/- 5 mm deviation
 - 2' spacing



SURVEY



Technical Excellence

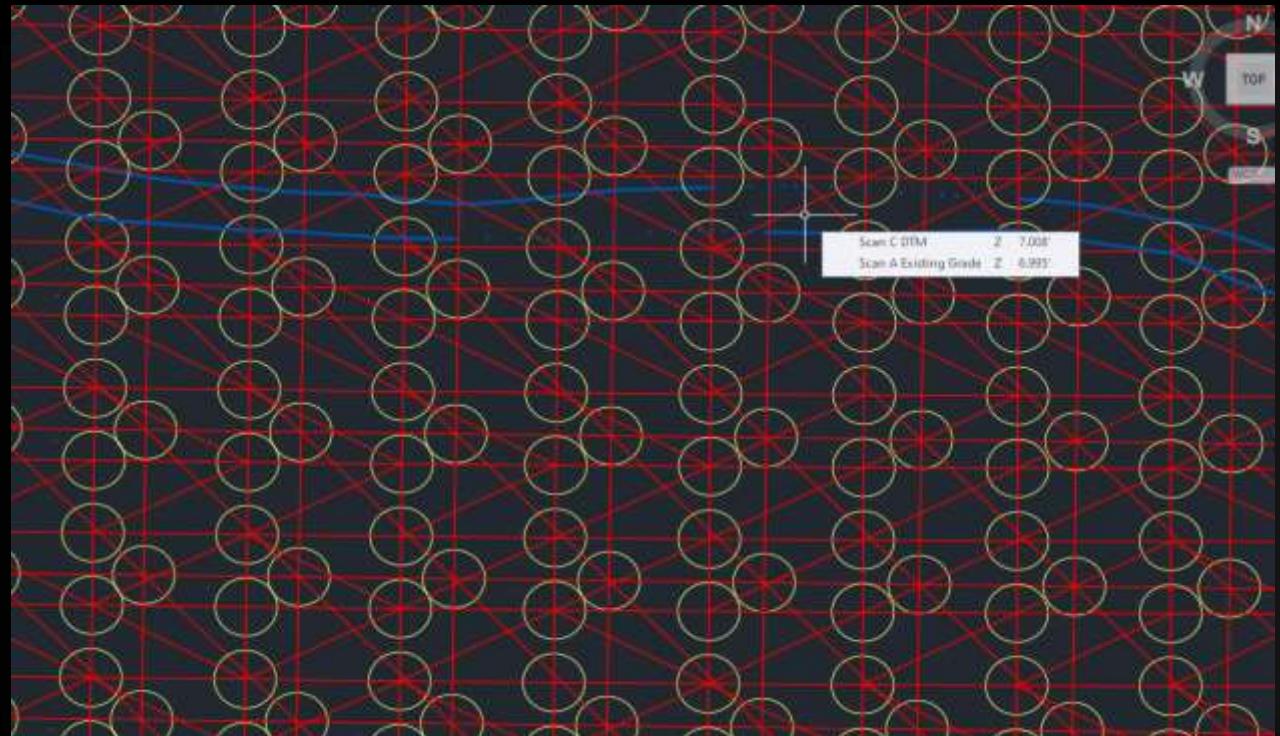
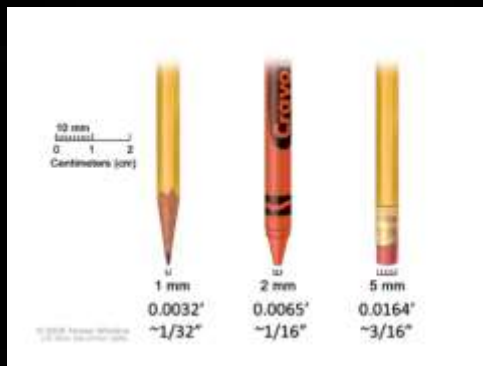
Practical Experience

Client Responsiveness

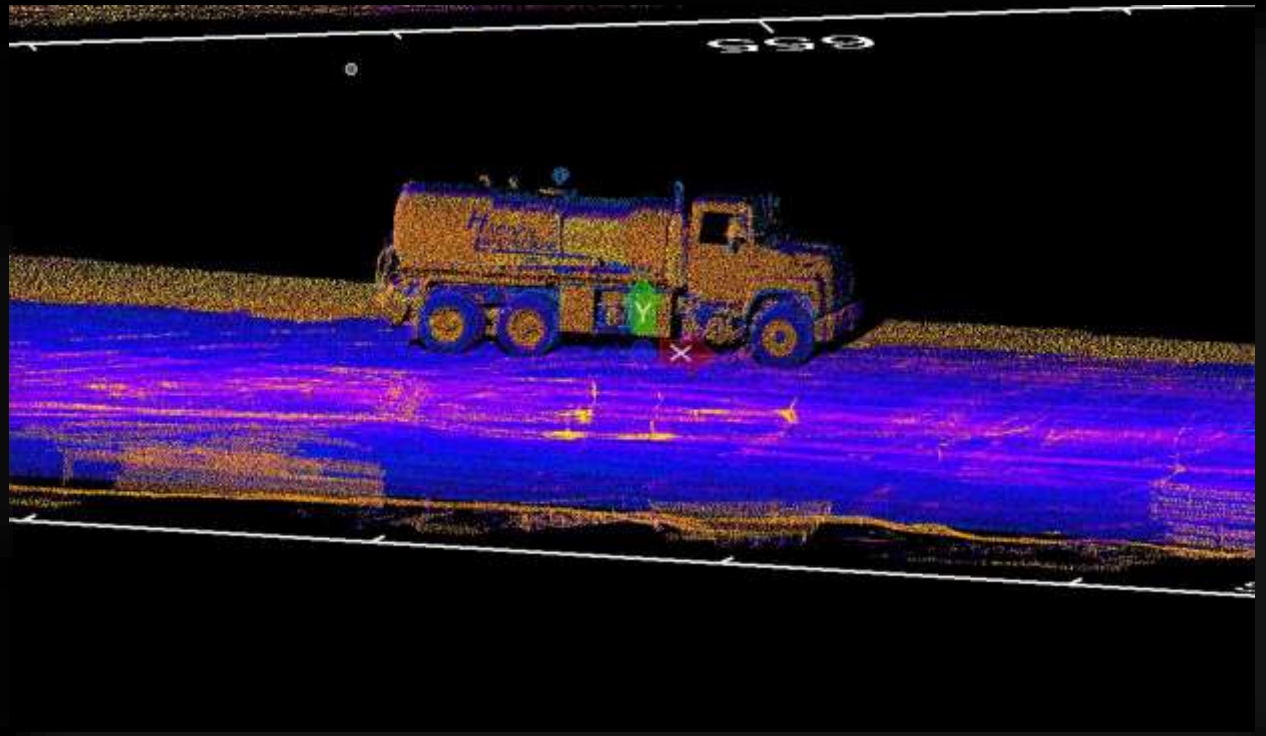
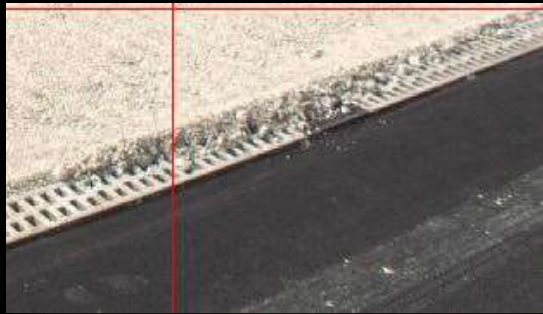
LANGAN

SURVEY

- High Accuracy
 - +/- 5 mm
 - 3.96 mm



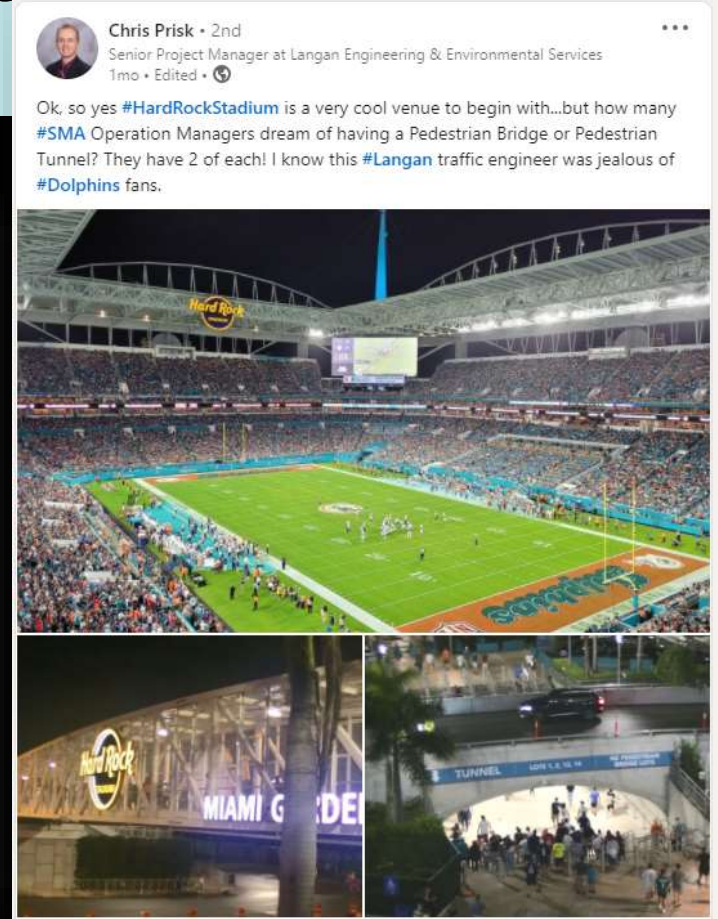
SURVEY



SURVEY



Additional work post event





F1 Miami Grand Prix Hot Lap
by APEX Circuit design Ltd