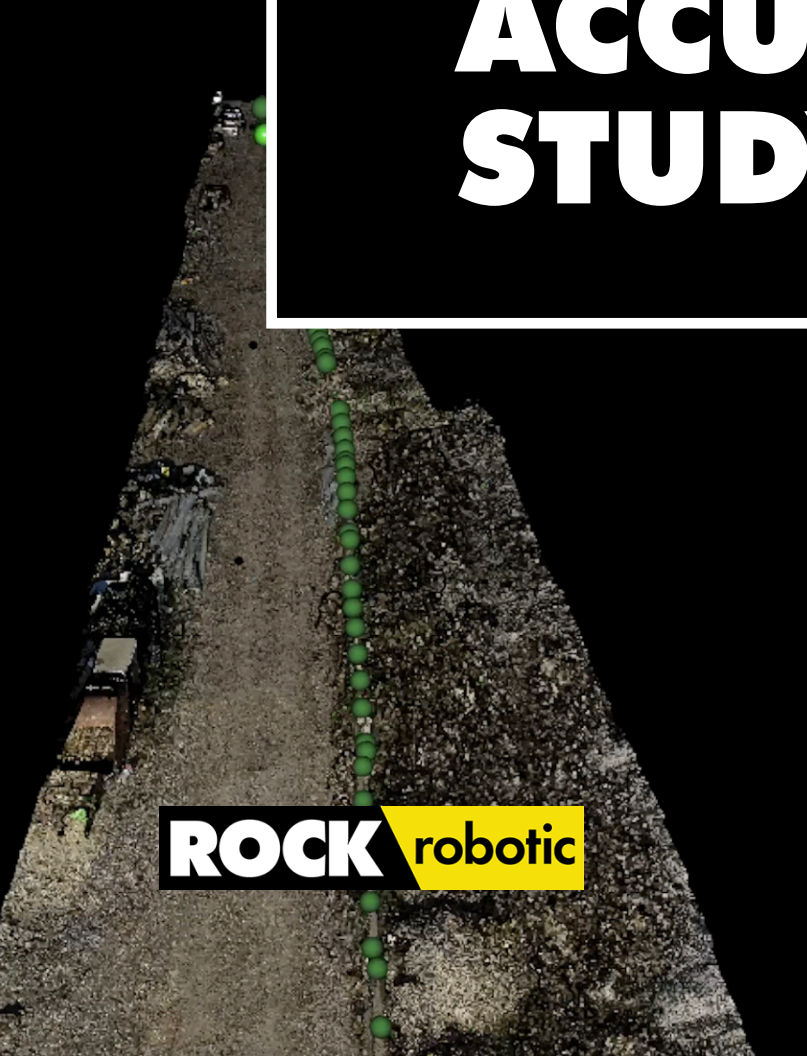


OCTOBER 2023



# R3 PRO ACCURACY STUDY



**ROCK** robotic



**Austin Bridge & Road**  
An Austin Industries Company

# ROCK R3 Pro LiDAR Accuracy Test Overview

01

## Test Location:

 Pinn Rd Construction Site - 450' Concrete Barrier Girder Survey Simulation

## Synopsis:

This accuracy test, held at the Pinn Rd Construction Site, was conducted to confirm the precision and dependability of the ROCK R3 Pro LiDAR and ROCK Cloud processing platform within a real construction setting. This thorough evaluation included thoughtful planning, executing drone LiDAR surveys, processing the gathered data, assessing its accuracy, and extracting insightful measurement information to prove success.



**VERTICAL ACCURACY:**  
**0.34 CM MEAN, 0.49 CM SD**

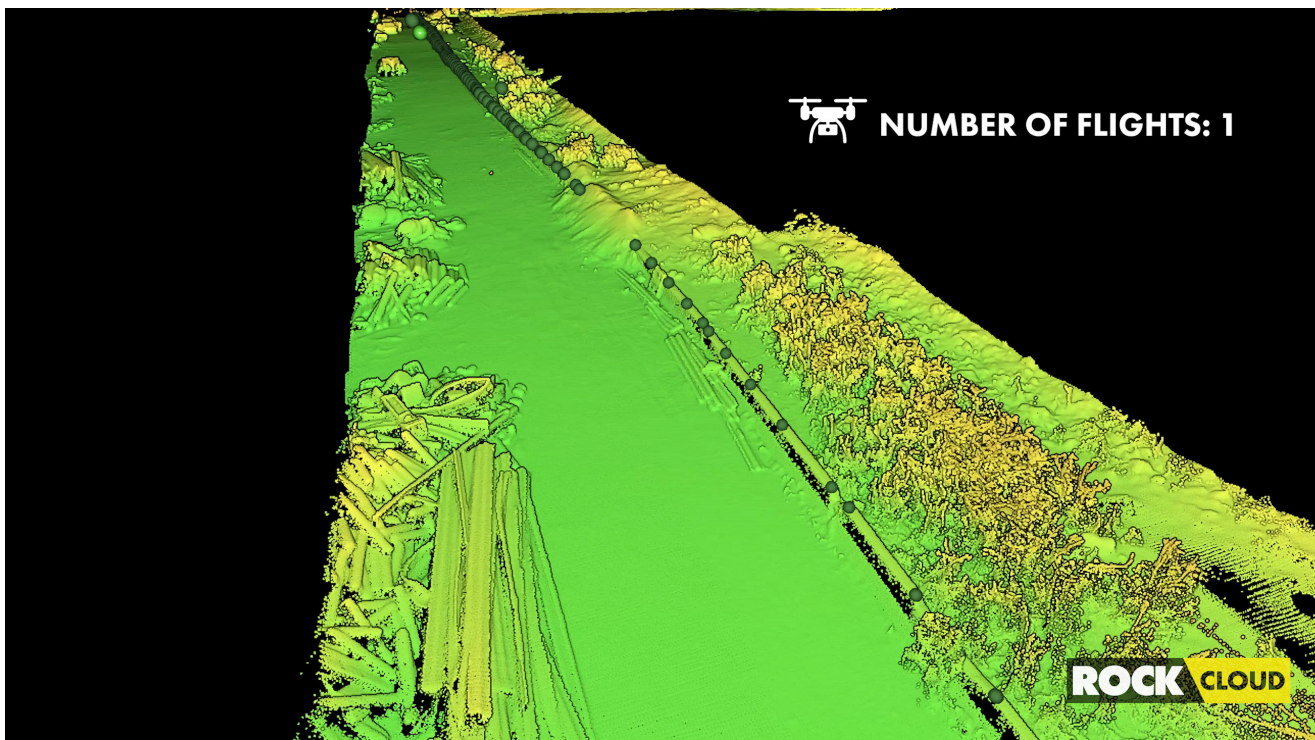


**TOTAL STATION CHECK SHOTS: 141**

**ROCK** CLOUD

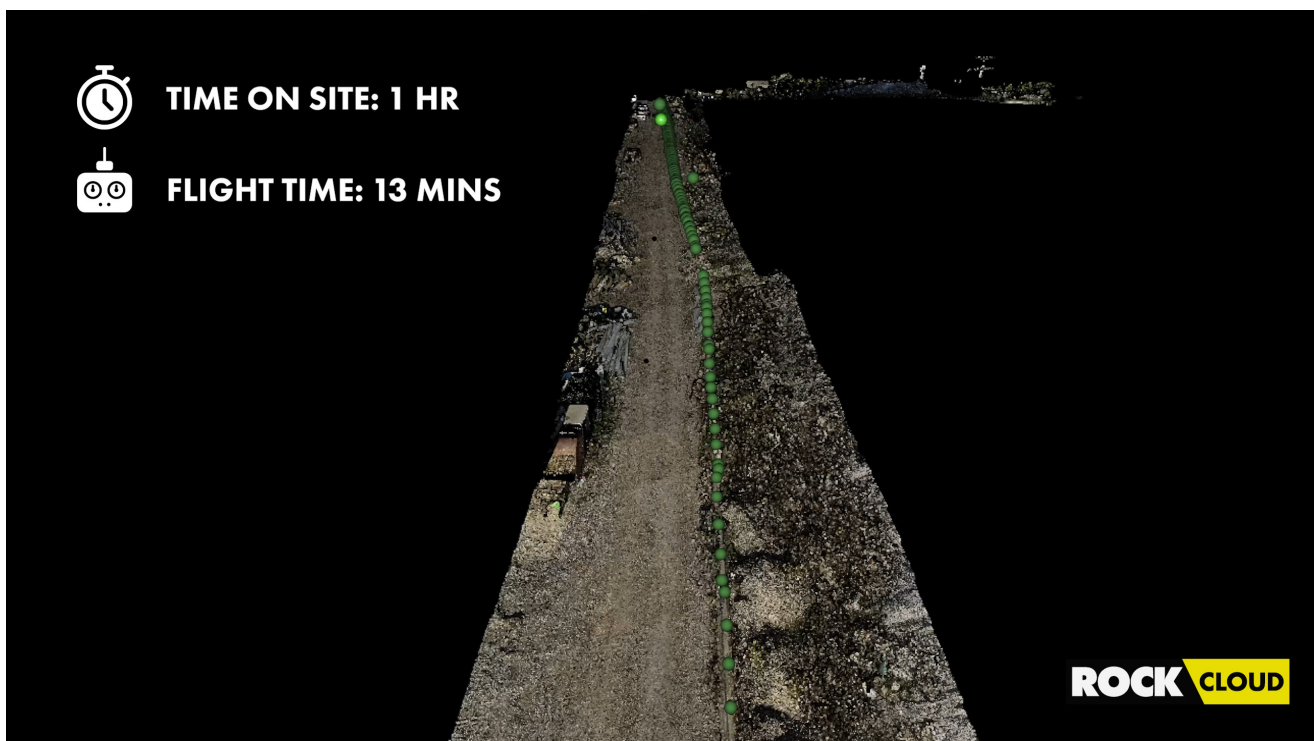
## Step 1: Local Measurement Benchmark Exercise

- LSC's survey department established a Local Ground Control Point at the test location.
- Known point and 3 GCPs for the Base Station to be positioned over for the LiDAR survey.
- 141 Total Station Check Shots were captured and withheld to compare the accuracy of the R3 Pro.
- The ROCK LiDAR data was zeroed to the Local Measurements, creating a starting point for accuracy evaluation.



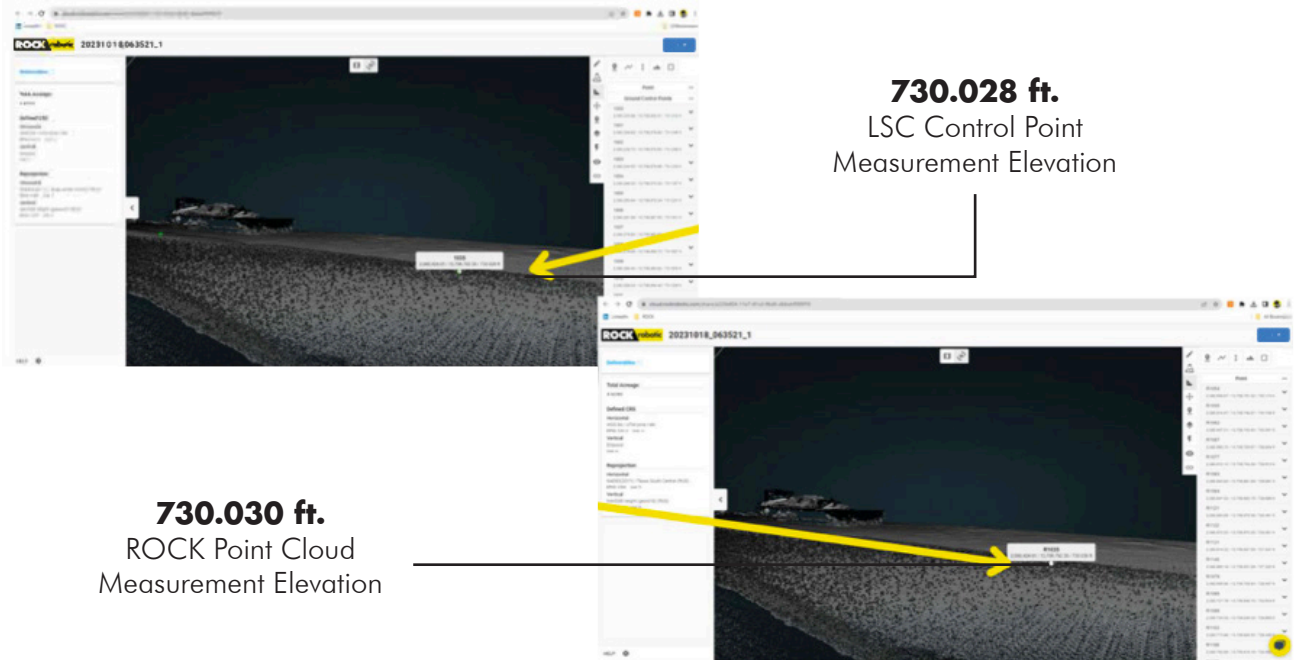
## Step 2: Drone LiDAR Survey Operations Demo

- ROCK demonstrated the setup and execution of the drone LiDAR survey operations in real time.
- Evaluation of safety improvements and potential time savings by replacing manual, high-risk operations with aerial surveys.



### Step 3: Data Processing & Accuracy Test

- Raw data from aerial inspection, merged with highly accurate ROCK Base Station data, was processed using ROCK Cloud.
- The data was transformed into a precise point cloud for accuracy assessment.
- Local measurements were imported into the point cloud for a delta assessment, comparing control points with the point cloud data.



#### ROCK R3 PRO LiDAR KEY FINDINGS



##### Coverage

4 acres



##### Time on Site

1 hour



##### Point Density

1600 point per sq.ft.



##### Vertical Accuracy

0.34cm Mean, 0.49cm SD



##### Flight Time

13 minutes



##### Number of Flights

1 flight

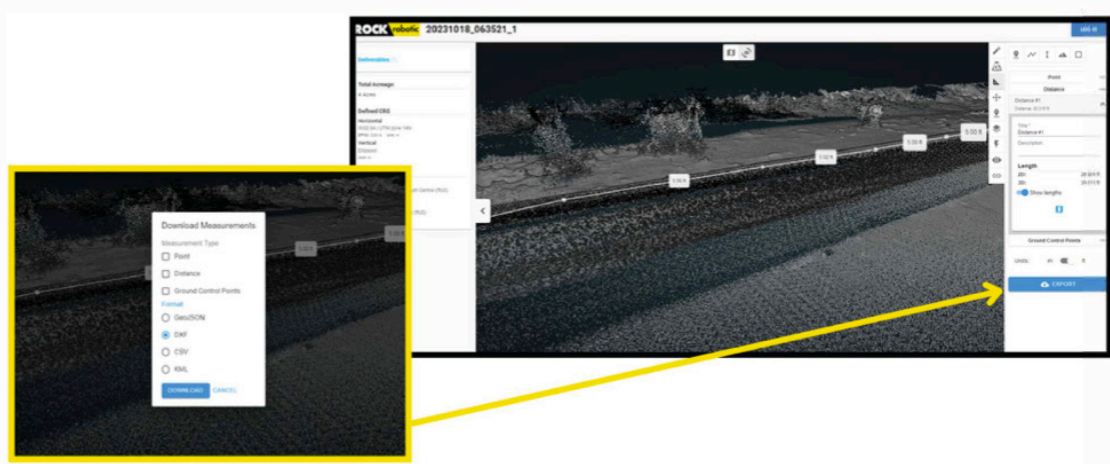
LSC SURVEY CONTROL POINTS			
Surveyed	Surveyed X	Surveyed Y	Surveyed Z
1054	2090509.604	13706751.31	730.091
1055	2090514.476	13706748.95	730.09
1062	2090547.035	13706733.49	730.02
1067	2090563.73	13706725.65	729.783
1077	2090612.123	13706704.34	729.487
1083	2090640.937	13706691.56	729.662
1084	2090647.261	13706688.75	729.665
1121	2090864.833	13706575.37	728.429
1122	2090870.21	13706572.36	728.359
1131	2090914.32	13706547.59	727.831
1140	2090960.183	13706521.26	727.227
1076	2090606.609	13706706.91	729.465
1095	2090727.78	13706649.76	729.607
1096	2090734.108	13706646.26	729.636
1103	2090773.966	13706625	729.403
1106	2090790.97	13706616.16	728.841
1109	2090800.224	13706610.39	729.038
1110	2090807.19	13706606.67	728.977
1114	2090827.528	13706596.09	728.944
1139	2090954.221	13706524.49	727.321
1090	2090704.295	13706662.46	729.444
1089	2090697.885	13706665.66	729.501

ROCK MEASUREMENT POINTS			
Name	X	Y	Z
R1054	2090510	13706751	730.0936
R1055	2090514	13706749	730.0886
R1062	2090547	13706733	730.0306
R1067	2090564	13706726	729.7836
R1077	2090612	13706704	729.4926
R1083	2090641	13706692	729.6706
R1084	2090647	13706689	729.6756
R1121	2090865	13706575	728.4306
R1122	2090870	13706572	728.3606
R1131	2090914	13706548	727.8206
R1140	2090960	13706521	727.1996
R1076	2090607	13706707	729.4666
R1095	2090728	13706650	729.6136
R1096	2090734	13706646	729.6436
R1103	2090774	13706625	729.4156
R1106	2090791	13706616	728.8316
R1109	2090800	13706610	729.0496
R1110	2090807	13706607	728.9856
R1114	2090828	13706596	728.9506
R1139	2090954	13706525	727.2966
R1090	2090704	13706662	729.4366
R1089	2090698	13706666	729.4986

MEASUREMENT DEVIATION		
Z Deviation in ft.	Z Deviation in cm	
-0.0025735	-0.078440273	0.07844
0.001426495	0.043479582	0.04348
-0.010573476	-0.322279561	0.32228
-0.000573413	-0.017477613	0.017478
-0.005573504	-0.169880393	0.16988
-0.008573496	-0.261320171	0.26132
-0.010573611	-0.32228366	0.322284
-0.001573487	-0.047959881	0.04796
-0.001573554	-0.047961915	0.047962
0.010426527	0.317800555	0.317801
0.027426391	0.835956399	0.835956
-0.001573496	-0.04796015	0.04796
-0.006573511	-0.2003606	0.200361
-0.007573512	-0.230840636	0.230841
-0.012573212	-0.383231509	0.383232
0.00942649	0.287319422	0.287319
-0.011573445	-0.352758602	0.352759
-0.008573554	-0.261321915	0.261322
-0.006573468	-0.200359299	0.200359
0.024426457	0.744518404	0.744518
0.007426879	0.226371282	0.226371
0.002426499	0.073959691	0.07396

## Step 4: Measurement Data Extraction

- Demonstrated methods for using ROCK Cloud’s measurement tools to establish girder height measurements.
- This data was provided to engineers for preparing Foam Cut files, showcasing the practical application of the accuracy-tested data.

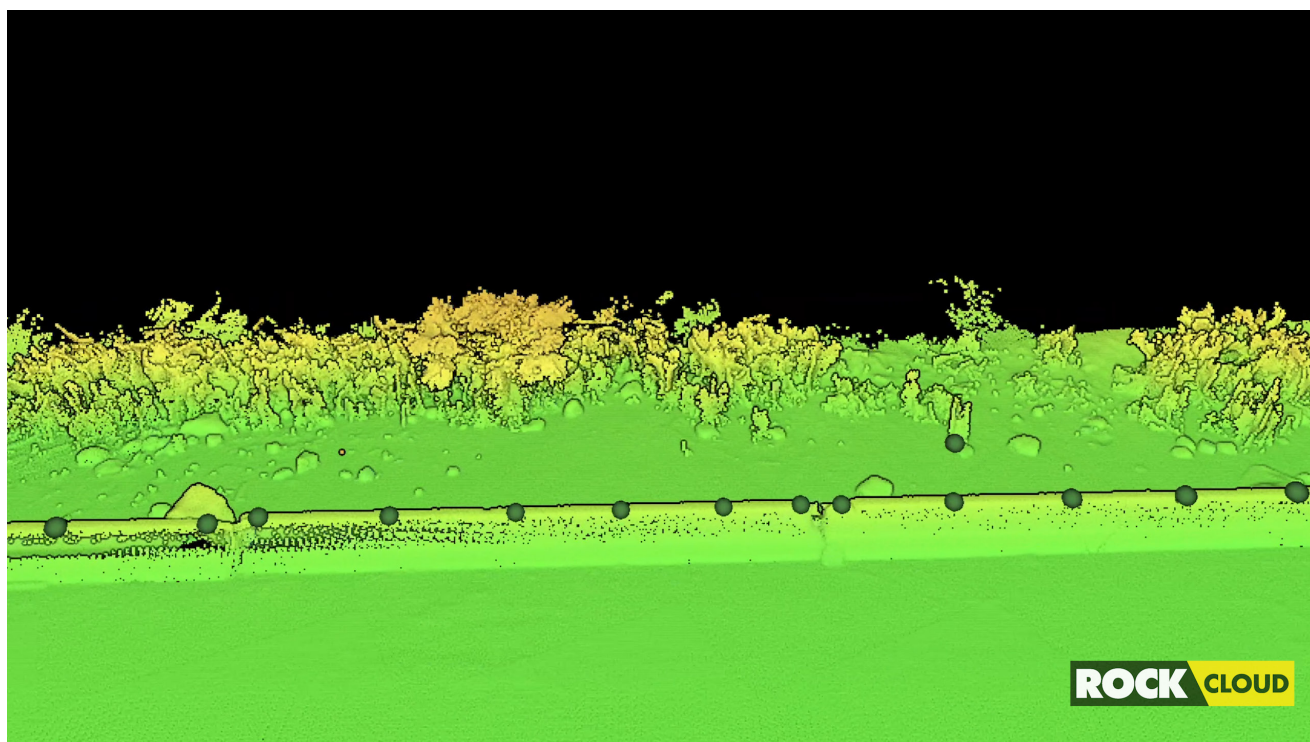


# Conclusion

03

The Accuracy Study for the ROCK R3 Pro at the Pinn Rd Construction Site demonstrated how LiDAR technology and precise measurements can be achieved with ease. The test's success highlighted the reduction of manual and hazardous tasks, resulting in improved safety measures. Furthermore, the quick data processing and accuracy emphasized the efficiency benefits, showcasing the ROCK R3 Pro and ROCK Cloud as a beneficial resource for construction endeavors.

This evaluation not only confirmed the accuracy of the ROCK R3 Pro LiDAR but also illustrated its capacity to transform the way construction sites are inspected and how decisions are made. The outcomes stand as evidence of the reliability and capability of ROCK Robotic LiDAR Solutions.



[View Dataset in ROCK Cloud](#)

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