

**data capture**

# NYC DOT Sunrise Yard Facility

## Cast Study: Anchor Bolt Laser Scan Survey



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Construction was underway, awaiting installation of the cast stone sill set under the curtain wall. Each stone unit was detailed with through holes to accept the anchor bolts used to fix the sill to the foundation then to the curtain wall.

### Parameters:

- 1/4" tolerance for alignment of bolt to through hole in X and Y dimensions
- Steel columns to be set plumb behind the cast stone allowing a cavity as well.

### Questions:

- Are the anchor bolts correctly located?
- Are there any conflicts with the steel columns and setting the cast stone?



Corinthian Data Capture laser scans the entire site using phase shift laser scan metrology. We capture trillions of points of data. Although we were contracted to document the anchor bolt locations, as you can see we captured:

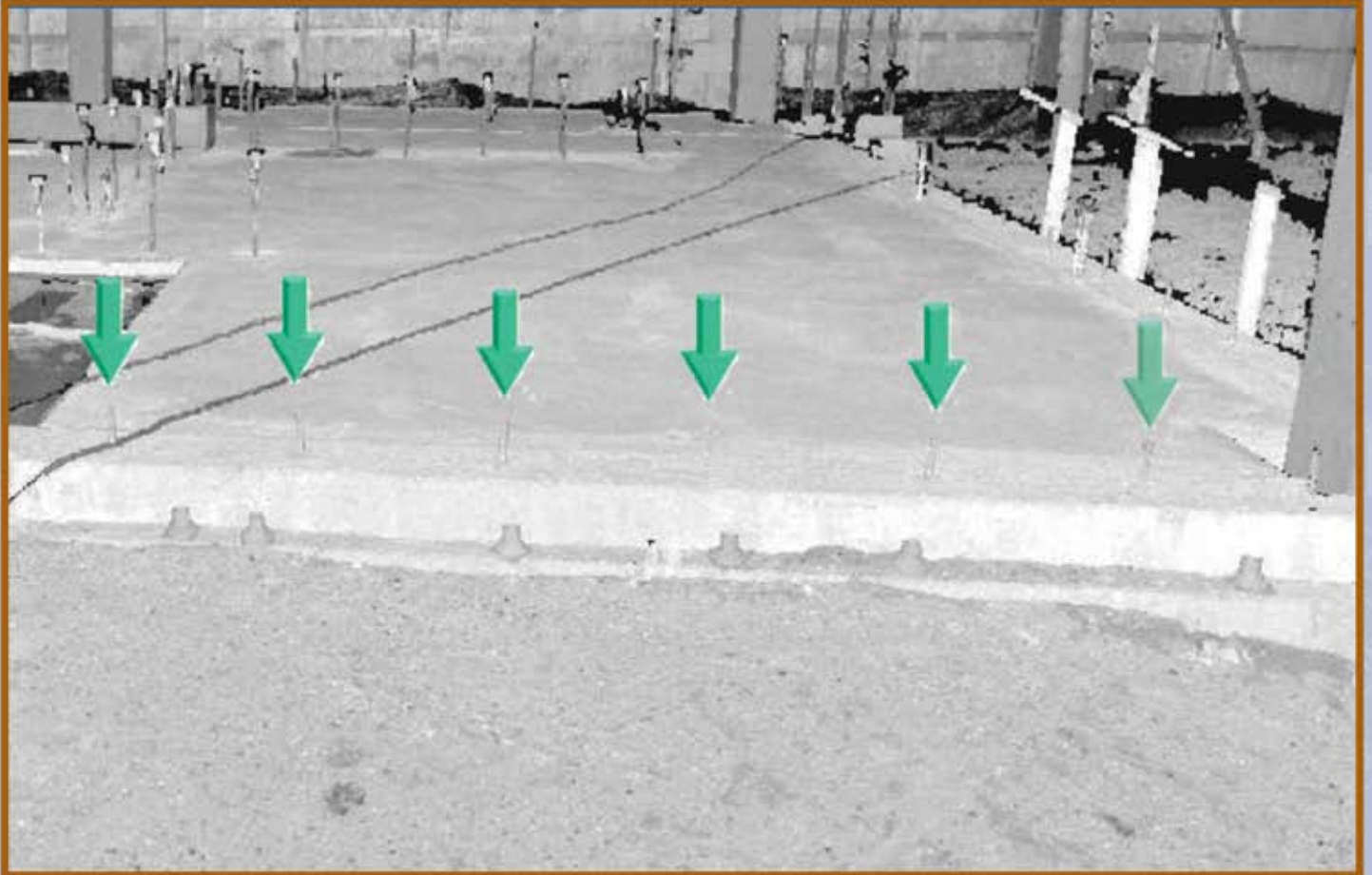
- Structural steel (plumb, level and exact location which can be compared to the structural drawings and steel shop drawings)
- Rebar placement (including rebar caps)
- Concrete geometry and flatness
- All site conditions (this acts as a safety record)



Scans can be read as Planar (photographic) or 3D view.



All scans are aligned to create comprehensive digital map of the construction site that can be measured or used as a foundation to create a BIM document for coordination of trades.

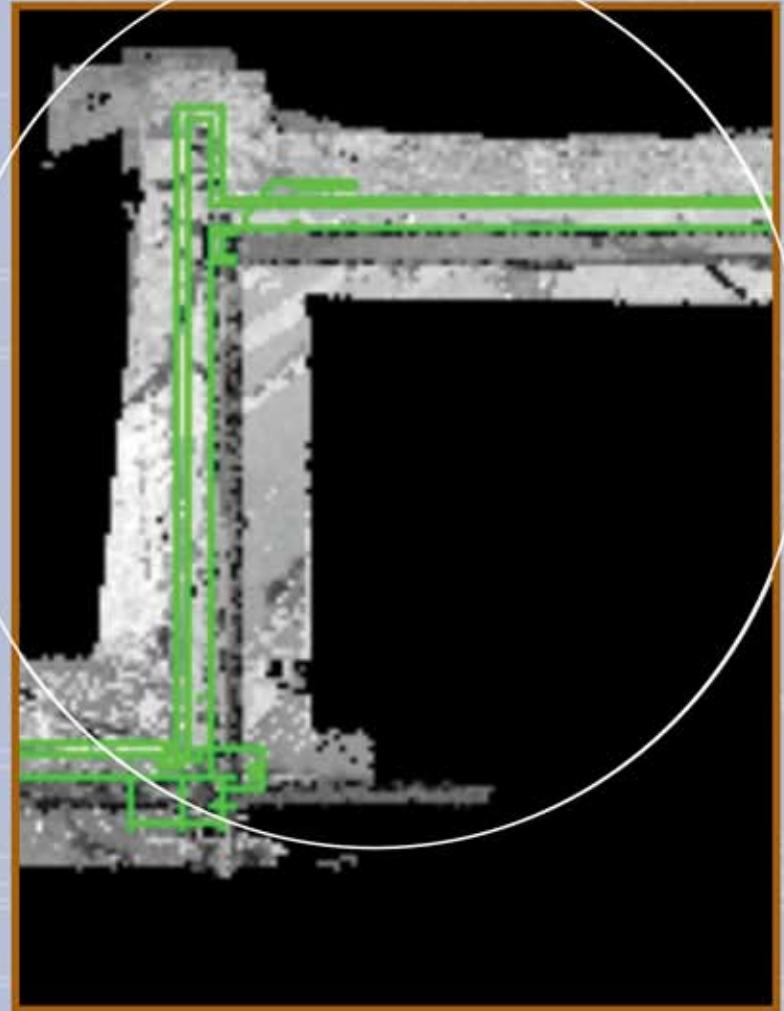
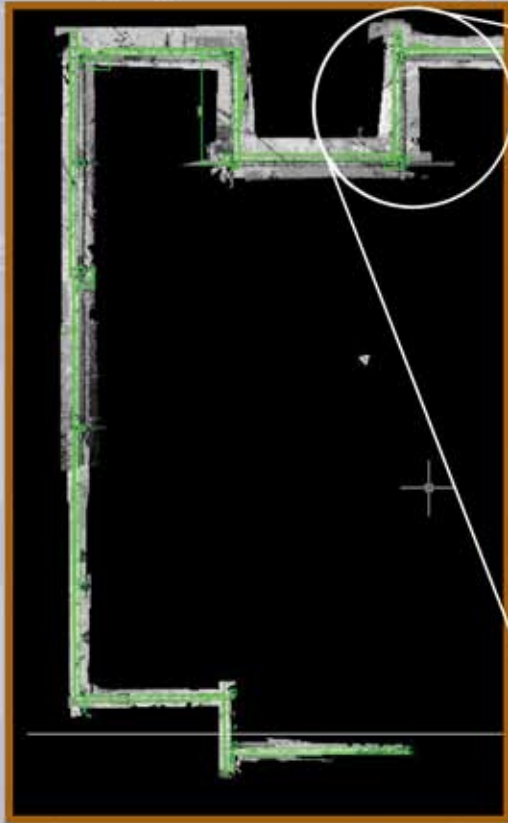


All existing anchor bolt locations are digitally captured in 3D space.



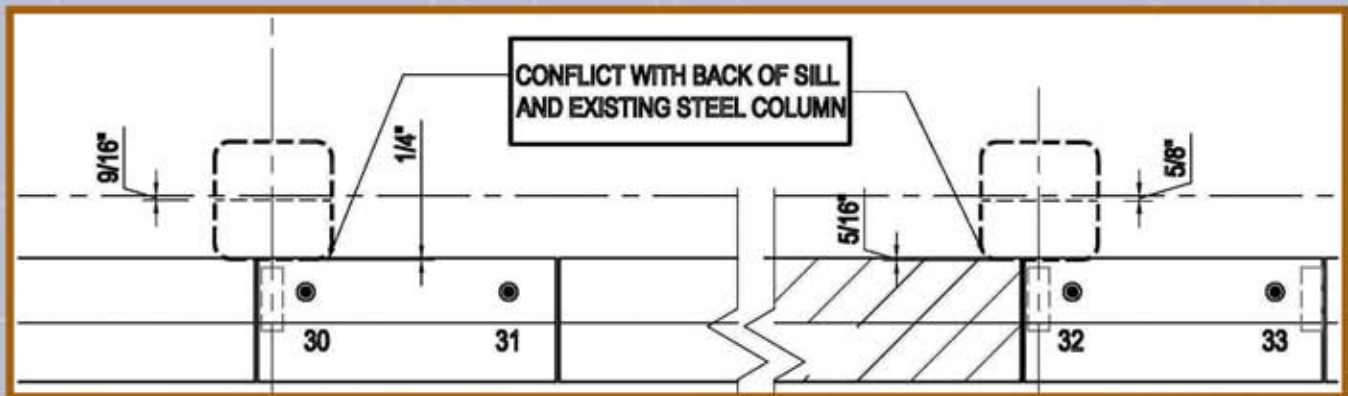
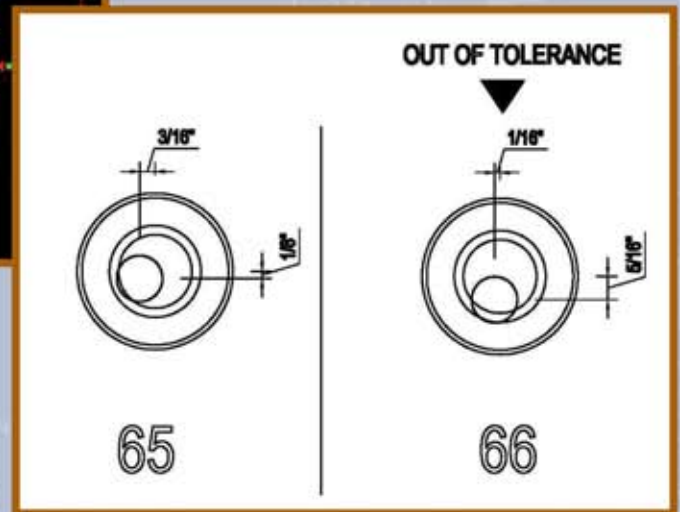
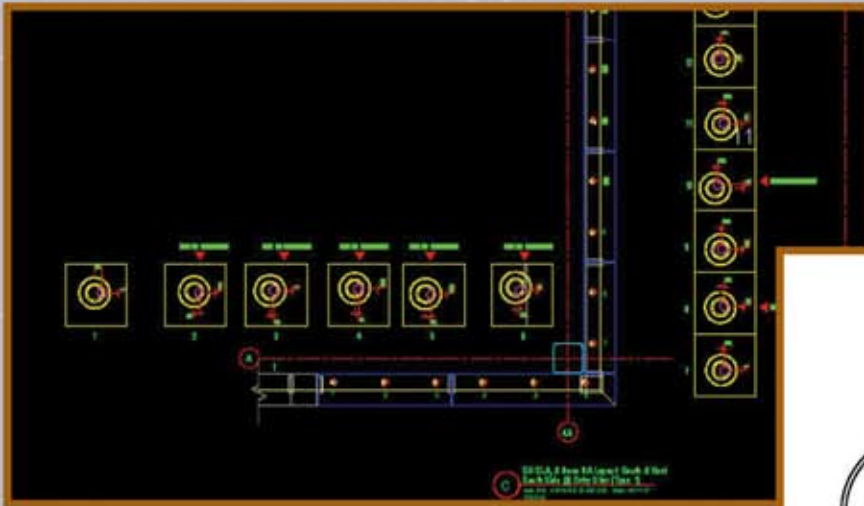
Scans files are processed in CAD software. A "slice" is taken through the 3D model and a section created one inch above concrete, where the bolt is "straight."

This allowed us to locate the true center point of the anchor bolt and the true location of the steel columns that may infringe on the setting of the cast stone sill.

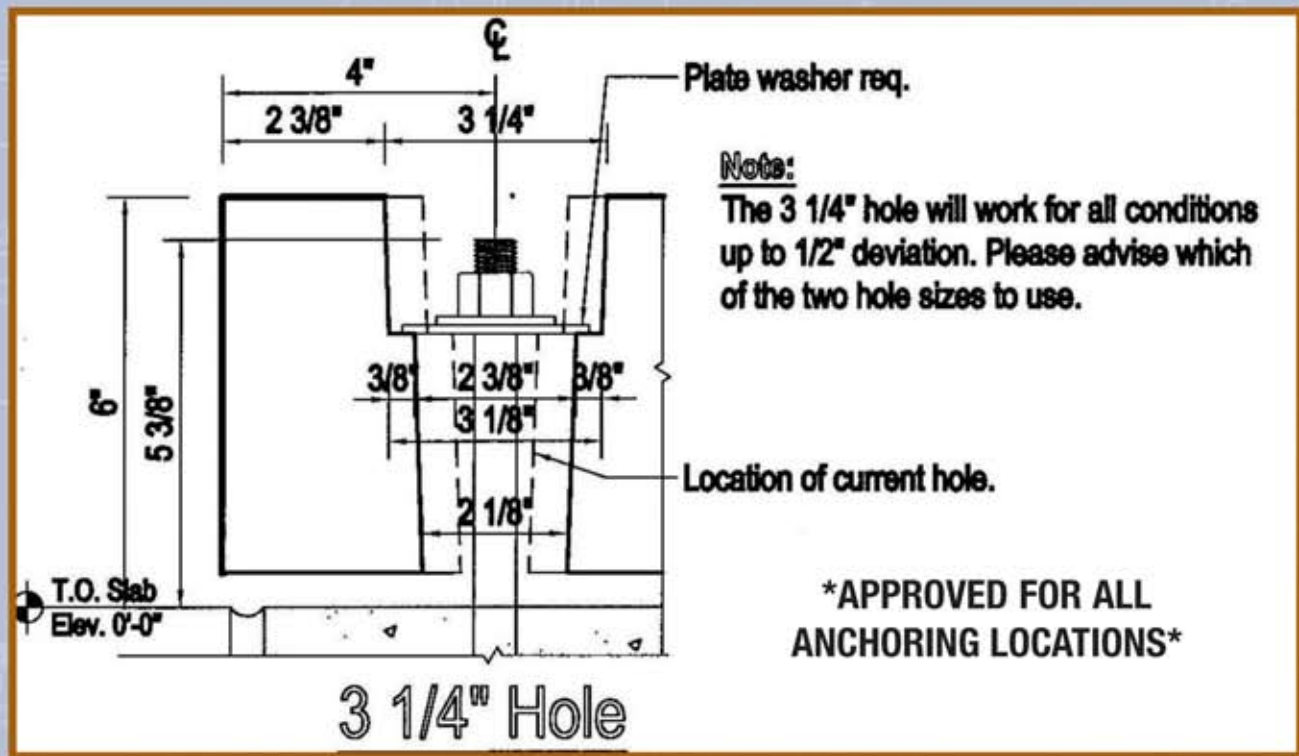


The approved shop drawing is overlaid on the scan data creating a precise existing conditions document. Which will allow analysis of the site conditions, and coordination of the various trades.





While the scope of work included only producing accurate as-built drawings of the anchor bolts, a thorough inspection of the 3D scans showed that the structural steel was placed incorrectly. An error normally not detected until the stone setter mobilized and the material was onsite. This information allowed a NO COST solution to be achieved... the stone was simply fabricated with a knock out in the mold.



THE SOLUTIONS could be suggested by any party involved. The object is to achieve minimal impact to the construction schedule and mitigate potential change orders expenses.

### Are the anchor bolts correctly located?

NO – three options were suggested to resolve the issues:

1. torch the anchor bolts, drill new holes and epoxy new bolts.
2. Cast specific hole locations for the locations for the individual anchor bolts
3. Cast an oversized hole to accept all deviations from XY tolerances – NO COST IMPACT

### Are there any conflicts with the steel columns and setting the cast stone?

YES – a simple NO COST solution was executed... simply installed a knock out in the mold before the stone was cast alleviating the need for the stone setter to modify the cast stone onsite.