

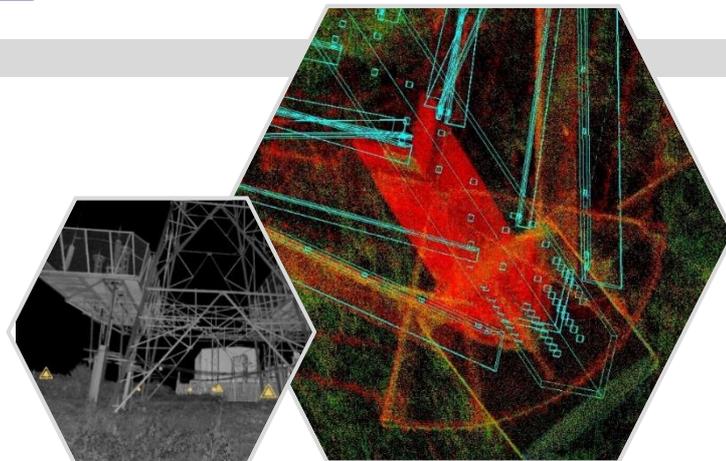
# CASE STUDY

## TOWER VERTICALITY, SCANNING & MONITORING



### PROJECT AT A GLANCE

**Project:** Tower Verticality, Monitoring & Scanning  
**Location:** Tilbury, Essex  
**Year:** 2019  
**Duration:** 2 days



### PROJECT BRIEF

LSTC were commissioned by a leading transmission line engineering and maintenance company who were working on behalf of UKPN (the client) to undertake emergency verticality checks and monitoring works on an L7 DT tower in Essex. The Terminal tower was positioned outside a substation, adjacent to a development area. The developer had created a large spoil heap close to the tower and substation fence and continued to heap more spoil onto the already large mound of earth, the weight of the spoil causing significant buckling damage to the substation perimeter fence, consequently the client feared the tower legs could suffer in the same way.

### CHALLENGES

- To deliver accurate verticality information in a limited timeframe.
- To establish a detailed coordinated record for future monitoring of the tower.

### OUR APPROACH

To provide the client with the necessary information as quickly as possible, LSTC mobilised to site to conduct a verticality survey of the tower using a Leica MS50 Theodolite and Leica GS14 GPS antenna.

A second visit to site one week later allowed us to repeat the verticality survey to ensure there had been no significant changes, and to conduct a High Definition laser scan of the tower with the Trimble TX8 as an accurate point cloud record of the tower's current condition. We also established Coordinated site control stations and recorded numerous points on the tower for subsequent monitoring purposes.

### PROJECT OUTCOME / DELIVERABLES

Using the survey data, we were able to extract the necessary information to prove that the tower's lean was within acceptable tolerance of 0.7 degree. We also provided square and diagonal stub dimensions which enable us to check the tower leg positions for movement. This information was processed, checked, and delivered to the client within 24 hours of the initial survey, confirming the steel legs had been distorted due to the pressure exerted by the ever increasing spoil heap.

Following the second visit, the verticality survey was updated, and the collected scan data was processed. As well as a full point cloud model of the tower, the client was provided with a DGN comparison model containing the point cloud data and an accurate 3D tower model, illustrating that the tower legs/foundations closest to the spoil heap had been pushed inward; this information will be invaluable to the client for any proposed corrective works. The scan data can also be used to check individual members of the tower and any ancillary equipment mounted on the tower in or positioned close by.

The client was also provided with a report containing a monitoring point schedule and location details.

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