

# Blast analysis with the I-SiTE 4400 laser scanner



The accuracy and high volume of data collected with I-SiTE's 4400 laser scanner makes it an ideal system for surveying blast sites. When combined with the powerful modelling and scan interrogation capabilities of I-SiTE Studio, the I-SiTE 4400 laser scanner provides investigators with abundant data for analysis.



Scan data of the site before the blast in true photographic colour

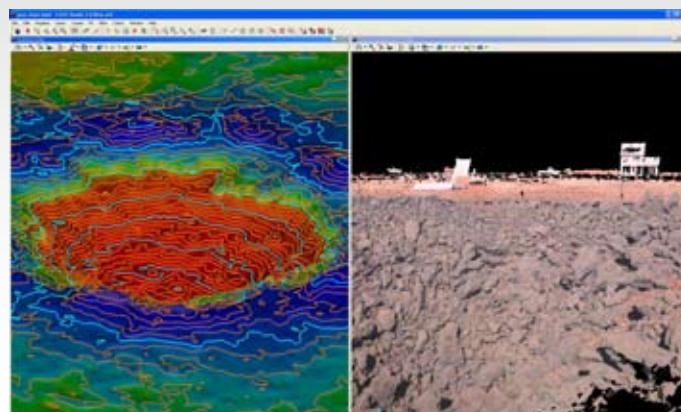
I-SiTE was contracted to perform pre- and post-blast surveys at a trial designed to test the ability of a normal house to withstand a large explosion. The site consisted of a house built to normal specifications and various other structures built to test properties for military and civilian applications. The survey area was about 130 metres square.

Using the I-SiTE 4400 laser scanner a complete survey was made of the site before the explosion. Scans were conducted from 11 set-ups with more than five million points acquired in only a few hours, providing analysts with a complete and accurate profile of the site before the explosion. Models of the house and terrain were constructed for comparison with the post-blast data.

Following the explosion the terrain had changed drastically. A large crater marked the location of the explosion and the damage to the house was so extensive that the structure was determined to be unsafe for entry. Using the I-SiTE 4400 laser scanner the structure and surrounding terrain were able to be safely surveyed for comparison with the pre-blast data. The interior of the upper storey of the house was surveyed from an elevated platform, providing investigators with data that otherwise could not have been acquired.

The crater formed by the blast was more than two metres deep and highly unstable. Using conventional techniques, a surveyor would have had to enter the depression to collect measurements, whereas the I-SiTE 4400 allowed the crater and ejected material to be safely surveyed from the perimeter.

More than three million points were gathered from nine set-ups, building up a detailed profile of the crater and surrounds post-blast. I-SiTE Studio was then used to create an accurate model from which contours and sections were generated for analysis.



The unstable crater marking the epicentre of the explosion can be modelled in high detail for analysing the strength and nature of the blast

I-SiTE Studio's powerful modelling capabilities, combined with the scanner's high-resolution imaging allowed for in-depth analysis of the crater and house, so that investigators could better understand the devastating effects of such an event. A bonus of using the I-SiTE 4400 is the simultaneous acquisition of a high-resolution digital image automatically registered to the 3D laser point returns. These post-blast images allowed investigators to view details as fine as cracks in the house walls, with the confidence that their position was automatically located on the three-dimensional data.

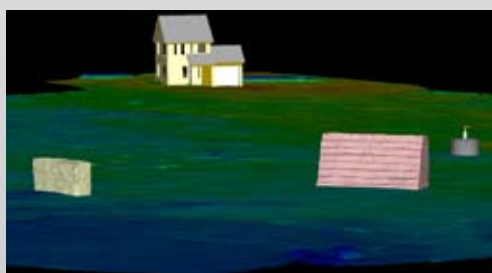
The I-SiTE 4400 laser scanning system provided a rapid and detailed survey of the blast site. The high level of detail obtained from the unique digital imaging abilities of the system allowed investigators to initially focus on acquiring data from the scene with the confidence that significant features could be identified and analysed thoroughly in a safe office environment.

Damage to the house in terms of its overall stability, as well as the destruction of individual materials, can be clearly seen on images acquired and registered automatically to the 3D data by the I-SiTE 4400



The results produced by the I-SiTE laser scanning system can be used to review building standards and design for high-risk locations. They also allow investigators to better understand the impacts and stresses created by an explosion of this magnitude.

Accurate and detailed models of the house, explosive charge and terrain, created from data captured with the I-SiTE 4400



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