Laser Mapping of the Lapal Canal in Selly Oak Park.

By Ken Pearson Surveyor/Director of Axon Laser Scans Ltd

The Lapal Canal Trust is restoring the 460-meter length of canal in Selly Oak Park in Birmingham, the line of the canal is very clear but over the years has been filled by garden refuse and general deterioration over the 50 years since it was abandoned. Lapal Canal Trust approached Atkins consultants for advice, and they were introduced to me and my company Axon Laser Services Ltd. The Trust has embarked on a restoration project to restore 5.5 miles of canal over the coming years, and being a trust, gains it's support through many avenues, one being voluntary assistance, whereby my services were utilised.

Area o be scanned

Scanning of area with some water

The brief was to ascertain complete measurements, including volumes of a section of the canal at Selly Oak Park. There are many traditional methods of achieving this, i.e total station topography, however technology has moved on and now the world of 3D laser scanning (which my company offers) has opened up a world of possibilities beyond measurement extraction, it also creates a permanent 3D record in extraordinary detail. Beside the architectural field, it is also used for Asset Management, Petro/Chemical plants, Highways/Railways/Rivers, Archaeology, Forestry/Arboretums and Traffic Accidents. The project the Lapal Trust has asked me to carry out was ideal for laser scanning.

How a scanned Section Looks

Positioning Reference Balls

Positioning scanning Head

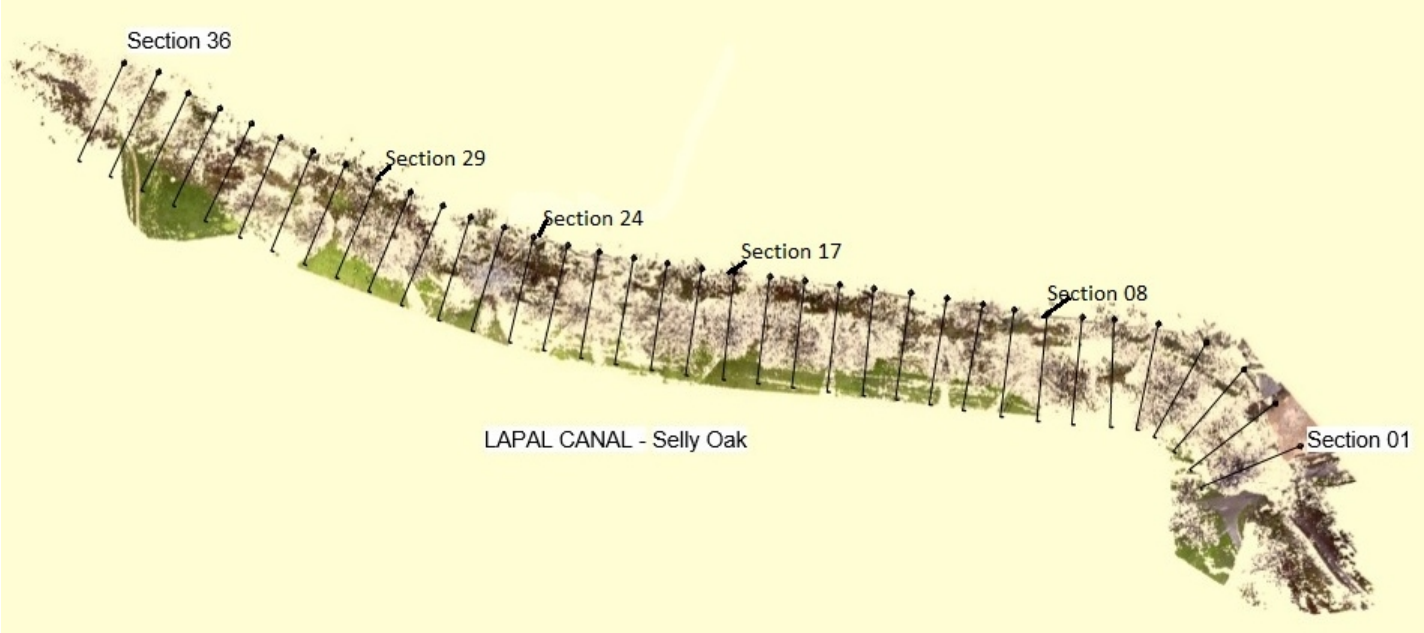
Automatic 360-degree laser scan and video

So what is Laser Scanning!

A laser scanner emits a rapidly moving laser beam and captures the points in 3D space from which the beam is reflected. The scanner is set up in various locations so as to capture the whole project area. For this section of the Lapal Canal about 21 scanning positions were used, with total time about 5 hours. The individual scans are linked together through scanning a minimum of 3 target spheres/checkerboards stationed between each scan setup. Because the area is overgrown care had to be taking setting up the spheres, typically these took 5 to 10 minutes to set up for each scan.

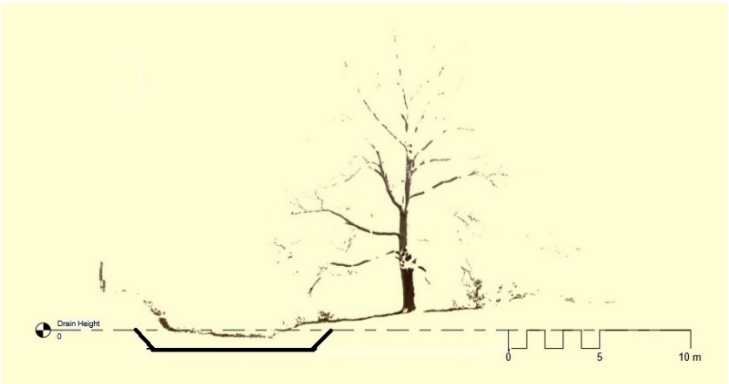
Once the site work is completed the information processed on a PC where scanner software registers each scan by matching the reference targets together and creating a 3d point cloud model. The resulting 3D model enables precise measurements between any selected points in the scanned objects and can, if desired, also include colour information/photos. This collected data is of exceptional quality and can be used either in its raw (Point Cloud) format or exported one of many file formats to use in 3D or 2D CAD software. By utilising this powerful technology, the scanning process is rapid, safe and non-invasive therefor less time is spent on site capturing as-built information, dramatically reducing project timescales and costs.

Examples of sections taken from the 3D model of scanned data

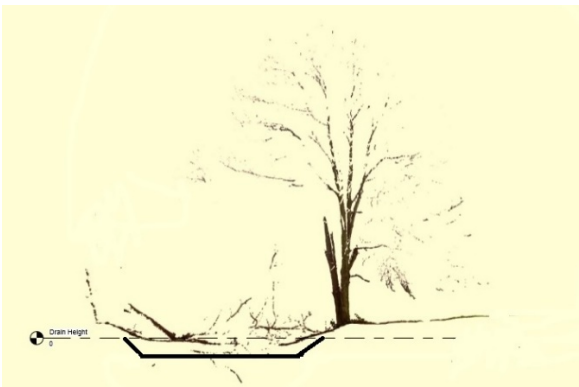


Section 1

Indicative canal profiles have been added for illustration. In section 1, 8 and 17 the canal has water in it, so scanned data, is to the water level. In section 24 and 29 some of the original puddle clay was removed and there is no water. The information can be used by the Lapal Canal Trust to help estimate the amount of infill to be removed and where and how much puddle clay to be restored to make the canal waterproof.

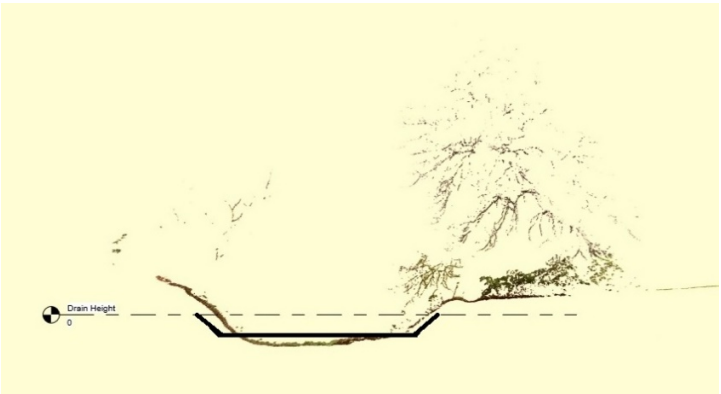


Section 8



Section 17

Section 24



Section 29

We have contributed a small part to this community venture, hopefully we may continue to be involved in the whole scheme!

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