

## **THE CONTRIBUTION THAT SURVEY HAS IN THE ENGINEERING FIELD**

### **Introduction**

Surveying is the art of taking measurements and mapping of natural and man-made features on the ground and under the ocean. Surveying is divided into different fields including: Cadastral Survey, Topographical Survey, Engineering Survey, Mining Survey and Hydrographic Survey.

Surveyors play an important role in the engineering field in terms of planning, designing and deciding if the project planned is feasible or not. Surveyors are the first ones to work on site and have a clear understanding of the area since they have work there. Their views can make a great impact on the project as a whole.

Surveyors are part of the engineering field and they work with all disciplines of engineering but most of the time they work closely with Civil Engineers. Land Surveyors are mostly involved in cadastral surveys which would include subdivision of land for registration and the creation of servitudes to protect existing and future services. Any structure that is built on the land needs to be positioned by the surveyor to make sure that it is in the correct site to avoid encroachments.

### **Civil Engineering**

Civil Engineering deals with the design and construction of structures like bridges, roads, dams and buildings. Before they could design anything on the site (for example a bridge) they would need to know who the owner or owners of the portions of land that will be affected by bridge construction and the process thereafter of acquiring those portions and the time frames. At this planning stage they would need to consult with a Professional Land Surveyor who would assist them with the advice to matters relating to the land and have a land audit of all portions that will be affected by the project. After the land audit is done, the Civil Engineer will now need a detail survey of the project area to be done. The Civil Engineer will use this detail survey to do the design for the bridge.

The surveyor will assist in setting out the position of the bridge. Some bridges are complicated and they would need high precision instruments which do not come cheap and maybe employ other surveyors to share ideas because on such structures sometimes old methods only can't work and new techniques have to be employed. The surveyor will be on site from the beginning of the construction to the end of it and he will have to produce as built surveys of everything that has been constructed.



Fig. 1 E.B. Cloete Interchange in Durban (N2-N3)

## Chemical Engineering

When Chemical Engineers are planning for the maintenance or repair of refinery pipes and they want to know exactly their position or their diameters they would ask the Surveyor to survey them. This exercise would be a difficult exercise using traditional survey methods and new methods would have to be employed. The use of a scanner would be the perfect choice for this type of survey. The working points inside the factory would be placed by a surveyor using a total station at the places that would cover the entire area of interest and the scanner would be setup on those working points to start scanning. When the scanning is done, the surveyor would reduce the data and give the client the final product. With that information at hand, the client can view whatever he wants to view and also measure whatever he wants to measure because he has more information at his disposal. Information such as this saves the client lots of money.

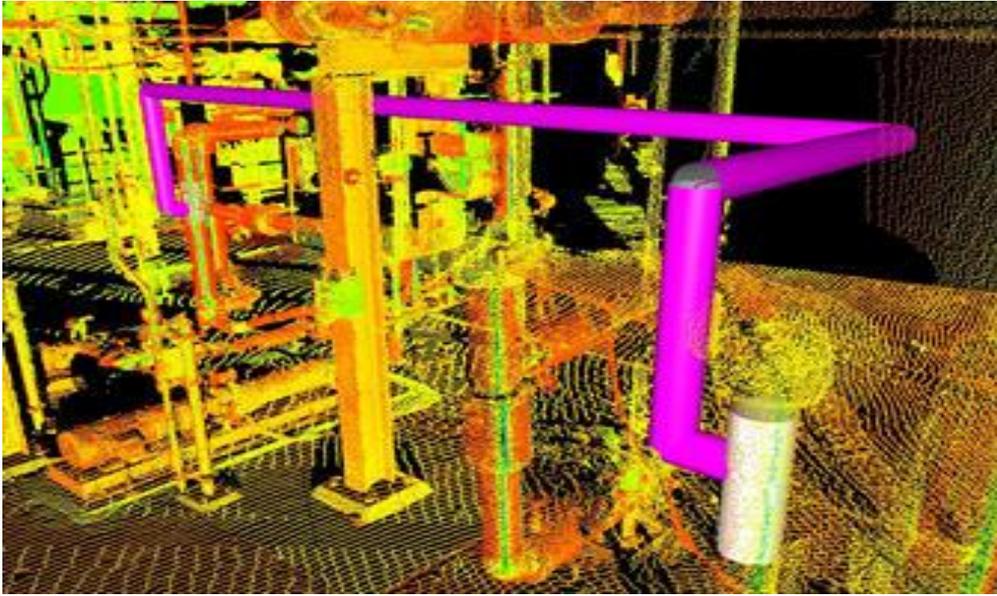


Fig. 2 Scanned Image of Refinery Pipes

## Mechanical Engineering

When Mechanical Engineers want to assemble a new overhead crane that a company has bought they would need a Surveyor to give them the position on the ground where they mount the crane. The Surveyor would have to use a high precision instrument in order to avoid any mistakes, the rails where the crane would be running would have to be exactly parallel to each other because if they are not they may cause damage to the crane.



Fig. 3 Overhead Crane

## Electrical Engineering

One of the largest electric suppliers in Africa is Eskom which has a Division called Land and Rights which deals mostly with land issues such as servitude acquisition and it employs mostly Land Surveyors. They survey servitudes for electric power lines which are designed by the Electrical Engineers. Land Surveyors survey the centre lines of the servitudes to assist with the correct placement of the pylons.

