

## **CHAPTER ONE**

### **INTRODUCTION**

Traditionally, survey filed work is needed at the different stages of any engineering project namely; the preliminary study, design study, construction and for the preparation of as build plans, in addition to the monitoring.

During the preliminary study a set of initial information and maps are required, by practical means for the design ( geometrical, structural ) study, a set of design elements that affecting the design are required to be collected from the field. An office work is required for the design. After the completion of the construction another survey, had to be done to record any change in the design for accomplishment of documentation. Finally some observations and comparisons had to be done regularly for monitoring purposes.

Surveying and mapping had recently undergone a change from discipline oriented technologies, such as geodesy, surveying, photogrammetry, cartography into a methodology oriented integrated discipline of geoinformation based on positioning, remote sensing (R.S), a digital processing for data acquisition and (Geographical Information System (GIS)) for data manipulation and displaying.

Data integration is made possible by geocoding, in which the Global Positioning System (GPS) plays an increasing role.

The basic fundamentals of Remote Sensing are the properties of electromagnetic radiation and their interaction with the body. This radiation is received by sensors on platforms in analogue or digital form and converted to images, which are subject to image processing.

A geographic information systems ( GIS ), in a narrow definition is a computer system based for the input, manipulation, storage and analysis, output of digital

spatial data. In a more broad definition it is a digital system for the acquisition, management, analysis and visualization of spatial data for the purposes of planning, administrating and monitoring the natural and socioeconomic environment.

The aim of this research is to test the possibility of doing the project stages remotely by using (R.S) and (GIS) with a low cost and to compare that with the traditional methods.

This research consists of seven chapters including this introductory chapter, chapter two discusses (R.S), while (GIS) was performed in chapter three. Chapter four contains ideas about the stages of engineering projects. Data collection and processing are presented in chapter five, and the results and analysis of this work was arranged in chapter six. And chapter seven which is a conclusion and recommendations for future work. Soil tests and the proposal design were included in Appendix A and Appendix B.