PREFACE

In early times Jerusalem only occupied a small area and was built mainly on limestone, which was the main source of building stone. In the past water supply was from springs and cisterns, and via an aqueduct system that included channels, bridges, tunnels and pools. Major infrastructure work included impressive buildings such as the Temple.

The expansion of modern Jerusalem westwards is also mainly over limestone and dolomite rocks. Some suburbs, however, have been built over softer rocks of chalk, marl and clay. The rapid development of the city in recent years, which includes tall buildings, highways, tunnels, bridges, a light railway system, water supply to all parts of the city, sewage treatment and purification as well as remedial works on pollution, have set new challenges for the engineers.

Nowadays, a greater understanding of the geology and the geotechnical characteristics of the rocks concerned is essential in planning and construction of all engineering infrastructure programs because of the variety of rock types that occur around Jerusalem. This also applies to archeological investigation of sites that is often required before construction begins.

The physical and mechanical parameters of the geotechnical rock units are described as well as the case histories of the construction of the Gilo tunnels and viaduct and the Mount Scopus tunnel, which were completed several years ago. Additional geotechnical data kept in the Geotechnical Laboratory of the Geological Survey of Israel have been added.

The book also deals with geological hazards such as slope stability, karst phenomena, sinkholes, seismic hazards and quarries that may be encountered during the planning and design of new projects. Particular attention is given to the water supply to Jerusalem, the hydrogeology, the aquifers, the local groundwater divide and the risk of contamination of the aquifer underlying the city.

Appendices include a table of the history of Jerusalem as a tale of destruction and construction and measured geotechnical parameters of the main geological formations in graphs and lists.