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2.2.3. Guidance and trajectory correction; 2.2.4. Installation of pipelines by jacking; 2.3. Various types of pipes; 2.3.1. Materials used; 2.3.2. Joints between pipes; 2.3.3. Resistance capacity of pipes; Chapter 3. Summary of Parameters Affecting Work at the Site; 3.1. Summary of parameters affecting the microtunneling; 3.1.1. Rate of penetration; 3.1.1.1. Duration for pipe jacking only 3.1.1.2. Total duration for the installation of a pipe in the ground 3.1.2. Alignment deviations; 3.1.2.1. Human factors; 3.1.2.2. Technological factors; 3.1.2.3. Factors linked to the soil; 3.1.3. Frictional forces; 3.1.3.1. Principle of analysis for experimental data; 3.1.3.2. Effect of the overcut; 3.1.3.3. Impact of the downtimes; 3.1.3.4. Impact of lubrication; 3.1.3.5. Impact of misalignment; 3.1.3.6. Impact of granulometry; 3.1.4. Stresses at the head; 3.1.4.1. Presentation of general results; 3.1.4.2. Influence of blasting and mucking; 3.1.4.3. Influence of trajectory deviations 3.2. Description of the main hitches that can occur when constructing a microtunneling site 3.2.1. Blocking of the machine; 3.2.1.1. Various boulders and obstacles; 3.2.1.2. Excessive friction; 3.2.1.3. Abrasiveness of the soil; 3.2.1.4. Sticking of clay; 3.2.2. Damaged pipes; 3.2.3. Surface disturbances; 3.2.3.1. Settlement caused by the annular space; 3.2.3.2. Instability of the face, poor balancing of the pressure at the face; 3.2.4. Excessive roll; Chapter 4. Guidelines for Investigations; 4.1. General approach of the investigations; 4.1.1. General objectives 4.1.2. Progress of the investigations 4.1.3. Cost of investigations; 4.2. Data to be acquired; 4.2.1. Geological configuration of the site; 4.2.2. Hydrogeological conditions; 4.2.3. Geotechnical characteristics of the ground; 4.2.4. Cavities and artificial obstacles; 4.2.5. Environmental conditions; 4.3. Methodology and means of investigation; 4.3.1. Documentary survey; 4.3.2. Geophysical investigations; 4.3.2.1. Objectives; 4.3.2.2. Usefulness of different methods; 4.3.2.3. General guidelines; 4.3.3. In situ boreholes and geotechnical tests; 4.3.3.1. Objectives of boreholes 4.3.3.2. Layout of boreholes

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**Sommario/riassunto**

This book includes recommendations prepared by members of the French Society for Trenchless Technology (FSTT), based on their recent national multi-year project. Comprehensive guidelines, techniques and theories in the areas of both microtunneling and horizontal drilling are given, encompassing the fields of application for each method, what investigations should be undertaken, which machines and equipment should be used, how the work should be managed and potential problems that may arise. The recommendations, the analytical methods used and their verification with laboratory and field data

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