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Why I Love Being an Engineering Geologist

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1. Lighting the spark

To start with, I'll have to admit that Engineering Geology wasn't exactly my first love. When we started the course in our third year, I had a few misconceptions that made me apprehensive. Firstly, I associated "engineering" with endless math problems, often making me nervous. Also, the horror stories my seniors told about the course's difficulty and strict lecturers were quite scary and kept me restless. However, as it turned out, those fears were entirely baseless. Instead, I discovered a passion for Engineering Geology that took me from fearful to fascinated. I eventually went on to pursue a career in the field — a journey that so far, has been nothing short of amazing. My industrial training in the construction industry unlocked the secrets of Engineering Geology, kindling a passion that has burned brighter with each new discovery.

I gradually realized the importance of engineering geological knowledge and the expertise of an engineering geologist in the construction industry, and my discoveries led me to liken engineering geologists to the geological equivalent of medical doctors, diagnosing and providing treatment plans for the Earth's "health" conditions. The understanding and interventions brought by the Engineering Geologist save lives, protect infrastructure, ensure sustainable development and resource management, mitigate environmental impact, enable safe waste disposal, manage water resources, and even facilitate renewable energy production.

Figure 1 Engineering geologists at work on site (photo retrieved from https://www.geologypage.com/2019/04/engineering-geology.html)

I became intrigued by how effectively engineering geologists could apply the knowledge of geology to engineering studies, to ensure that geological factors like rock and soil type, groundwater, slope stability, seismicity, volcanic activity, subsidence, landslides and rock falls, soil liquefaction, and environmental factors, are accounted for in the planning for and design and construction of projects.

Engineering geologists go beyond mere identification of geological hazards; they also develop and implement comprehensive strategies to counter potential issues that may arise during construction, providing actionable recommendations to curtail risks, minimize environmental impact, and ensure the long-term viability of projects.

For example, before carrying out construction for a proposed residential bungalow, we carried out a desk-based study and developed a conceptual model, undertook site investigations including boreholes and geophysical surveys, and determined soil properties before a suitable foundation was proposed. Groundwater monitoring and sampling are also undertaken to check the depth to groundwater and identify potential contamination sources, and advise on a groundwater management plan to prevent pollution. The site's ecological sensitivity is also assessed to check the possibility of any natural hazards, such as coastal erosion and flooding, and safety measures employed, like the use of environmentally friendly construction materials and implementing a stormwater management system.

As an Engineering Geology intern, I also get to carry out analysis on soil samples collected during site investigation at the Geotechnical laboratory, and this is usually my favorite part of the job. At the laboratory, soil samples are subjected to various tests, including Atterberg’s limits test, particle size distribution test, compaction tests, and others. We do this so that we can properly classify the soil and determine its engineering properties, such as the shear strength, moisture content, density, etc.

İn Nigeria, the Engineering Geology profession has been gaining recognition and is now an integral part of the construction industry. Engineering Geologists carry out detailed in-situ soil investigations before the construction of any road, bridge, building, dam, quarry, or mine. Tests like the Geotechnical borehole drilling to obtain soil samples or rock cores, and Standard Penetration Tests are widely used. They usually follow designated ASTM and FMWH (Federal Ministry of Works and Housing) standards.

Figure 2 Dynamic Cone Penetrometer test on a proposed site for a bungalow at Ebonyi state, Nigeria by Mapref Geotechnical Ltd.

Another reason why I love Engineering Geology is that I get to travel and explore different site locations to perform various tasks, including geological mapping, site investigation, sampling, groundwater monitoring, and construction supervision.

Figure 3 Author at Ebenebe sandstone quarry site, Anambra, southeastern Nigeria.

2. Making The Possible Safe

An engineering geologist once said, "The engineer's responsibility is to make the impossible possible, and the geologist's responsibility is to make the possible safe". Yes, that's what we do, and I love what we do!

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About the Author

Miss Adaeze Precious is currently an Engineering Geology intern at Mapref Geotechnical Limited, Nigeria, with about 2 years of experience in Engineering Geology and Geotech. She holds a Bachelor's degree in Geological Sciences and has written articles related to Engineering Geology and the environment, some published on Medium and some still unpublished. Miss Adaeze Precious is passionate about Engineering Geology, environmental conservation and well-being, and climate change, and is committed to developing the requisite skills and gaining relevant experience to advance in the field of Engineering Geology.