



INTERNSHIP POSITION # 4

CIVIL ENGINEERING

DATE: From the 1st day of August 2023 to the 26th day of July 2024

AREA WITHIN THE COMPANY THE STUDENT WILL PERFORM HIS INTERNSHIP: Global Research & Development, Structural Engineering & Design

POSITION PURPOSE:

Global Research and Development Department is a core team inside CEMEX INNOVATION HOLDING based in Switzerland. The aim of the team involves research and development of new products and solutions for the different challenges CEMEX has as a key global player in the construction industry as well as specialized technical troubleshooting for all CEMEX operations, mainly Cement, Concrete, Aggregates and Admixtures.

PROJECT TO BE DEVELOPED: Advanced Durability Testing of Fiber Reinforced Concrete (FRC)

ACTIVITIES:

- Support the engineering specialists and researchers assigned to the BIM Project in the field of Structural Engineering.
- State-of-the-Art review of mechanical and durability testing for concrete and FRC
- Development of proprietary FRC to maximize durability characteristics from concrete production to testing.
- Advanced fracture mechanics modelling of Type-I and Type-II fractures for durability
- Contribute to the development of new algorithms to forecast materials behavior.
- Analysis of Non-linear software codes.
- Troubleshooting of proprietary structural software

DELIVERABLES / OUTCOMES:

- Assessment of structural systems under continuous damage scenarios (real life simulation considering environmental exposure and fatigue). Different design criteria and methodologies are being investigated together with different new concrete materials and techniques.
- New algorithms for the structural design with non-conventional cement-based composites.
- New cement-based composite materials with optimized durability properties.

CHALLENGES:

The student will deal with a comprehensive, industrially relevant topic, from conception to application and will have the support of Structural Design and Engineering team and the Global Research Laboratory as well as training about the construction industry technologies, in order to have an overall view of the topic.