

Universidad de Lima  
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**TIME OPTIMIZATION PROPOSAL FOR THE  
DESIGN AND EXECUTION OF PLUMBING  
SYSTEMS IMPLEMENTING VDC  
METHODOLOGY: 6-FLOOR BUILDING CASE  
STUDY**

Tesis para optar el Título Profesional de Ingeniero Civil

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# Time Optimization Proposal for the Design and Execution of Plumbing Systems Implementing VDC Methodology: 6-Floor Building Case Study

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## Abstract:

In recent years, the architecture, engineering, and construction industry has been characterized by large losses of resources, time, and costs. One of the main reasons for this problem need for more integration and collaboration between project stakeholders in different areas and specialties. The design, coordination and installation of mechanical, plumbing, electrical (MEP), and fire protection (FP) systems represent one of the main areas of improvement in the construction industry, especially in complex projects. The present research implements the Virtual, Design and Construction (VDC) methodology as an empowering agent in the optimization of time in the design and execution processes of plumbing systems in a 6-floor building of approximately 2,120 square meters in Lima, Peru. Initially, the traditional workflow for designing and executing sanitary systems was mapped. Then, an optimized workflow was developed considering the principles of the VDC methodology. As a result of the optimized workflow, it is possible to foresee a 5% reduction in design time and a 23% reduction in execution time.

**Keywords:** Virtual Design Construction, VDC, MEP, coordination, BIM, plumbing systems, prefabrication.

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