



Multi-Storey Steel Office & Teaching

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Abstract: This thesis paper explains with a certain amount of details the whole process involved in the design of a Multi-layer steel construction, from the preliminary architectural design to the final structural detailed drawings. As it is specified in the project description, structural steel being quite popular for the recent 30 years, it's been fruitful to experience the efficiency of the structural steel properties during the design process and achievement. To accomplish this Design, we mainly used licensed software by Autodesk, including Revit Structures for the architectural design and Robot Structural Analysis professional for the structural analysis and design.

Keywords: Steel ~~Structure~~; ~~Multi-layer Building~~; Architectural & ~~Structural~~ ~~Structural~~ Design; ~~Structural~~ ~~Structural Design~~; Analysis; ~~Analysis Results~~.

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多层钢结构办公与教学综合楼的设计

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摘要: 本文详细阐述了多层钢结构 **建筑及结构** 设计的全过程, 从初步建筑设计到最终的结构详细图纸。正如工程描述中所指出的, **钢结构建筑** 在近 30 年来相当流行, **在通过** 设计过程和 **成就设计成果**, **中非常有效的体验了钢结构的各项钢性能的效率是很有成效的以及所带来的优势**。为了完成这一设计, 我们主要使用 Autodesk 授权的软件, 包括用于建筑设计的 Revit 结构和用于结构分析和设计的 **专业机器人结构分析专业人员程序**。

关键词: **钢结构**; **多层建筑**; **建筑与结构设计**; **结构设计**; **结构分析**; **分析结果**。

Introduction

We are living in an absolutely wonderful era, where technology is constantly evolving. When a few years ago it would take month to completely design and analyze a Multi-story structure, nowadays within hours the process can be completely given appropriate data, rendering extremely precise results. Steel being a wonderful material, which has been used for quite a few years now, makes the process of designing and analyzing it a must, which can't be ignored in the field of civil engineering.

Throughout the process experience can be gained while dealing with the diverse and versatile properties of steel, which have to be controlled carefully. Buckling, fire, and many other aspects affecting the good performances of steel.

Using specific software like Autodesk Robot and Revit, we can save a considerable amount of time, while checking and analyzing the whole structure, just a few clicks away. The fact they interconnected is an advantage that can't be neglected. Without further words, let's get into the core of our project.

1 Architectural design

1.1 Structure philosophy

The philosophy on which I based my structural design is meant to be modern with a slight touch of classic methods of architectural designs.

The space management and the room arrangement is particularly inspired by the J building of china three gorges university campus, a teaching building and an office building,

suitable framework which largely satisfy the functional requirements of an Office and Teaching Building which is our goal, and smoothly laid for us a very good foundation for the next work ‘structural design’.



1.2 Structure description

The structure consists of:

A teaching building: mainly made of classrooms, and Offices. The structure is mainly inspired from the J building, in china three gorges university campus;

Preliminary design

The first step into the design process was the preliminary design, I had to think about the shape, the rooms' functions, the building orientation, the number of buildings and every single aspect of the future building. And using sketches and hand drawn sketches, I designed the first look of the structure.

Detailed design

The detailing then has to be done with respect to the design specifications and Chinese codes relative to steel structures. Drawings (architectural and structural) will then be exported to dwg format, and mastered in AutoCAD.