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Equilibrium models for helicoidal laterally supported staircases (Article)

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Abstract

The paper aims to illustrate a course of action for analysis and verification, based on the classical equilibrium limit conditions, of a particular structural element, as the helical staircase. The static analysis is the basic approach for every mechanical model which may provide more detailed results successively. The illustrated approach can help the easy interpretation of the structural behaviour of helical stairs and suggests procedures for decision and design of refurbishment interventions in the professional practice. In the final part of the paper sample results are shown to illustrate the approach to the problem and some relevant solutions. © 2012 Elsevier Ltd.

Author keywords

Bearing capacity; Curving flights; Equilibrium; Helicoidal staircase; Masonry; Torsional solution

Indexed keywords

Analysis and verifications; Curving flights; Helicoidal staircase; Masonry; Professional practices; Structural behaviour; Structural elements; Torsional solutions

Engineering controlled terms: Bearing capacity; Civil engineering; Computer applications; Phase equilibria

Engineering main heading: Stairs

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Special Issue: KRETA

Equilibrium models for helicoidal laterally supported staircases

Alessandro Baratta, Ileana Corbi

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Abstract

The paper aims to illustrate a course of action for analysis and verification, based on the classical equilibrium limit conditions, of a particular structural element, as the helical staircase. The static analysis is the basic approach for every mechanical model which may provide more detailed results successively. The illustrated approach can help the easy interpretation of the structural behaviour of helical stairs and suggests procedures for decision and design of refurbishment interventions in the professional practice. In the final part of the paper sample results are shown to illustrate the approach to the problem and some relevant solutions.

Keywords

Helicoidal staircase; Curving flights; Equilibrium; Bearing capacity; Torsional solution; Masonry

1. Introduction

The complex helicoidal configuration of the spiral stairway makes its study pretty difficult to be handled. A review of the most commonly applied procedures for structural analysis

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- Abstract
- Keywords
- 1. Introduction
- 2. Definition of the problem
- 3. Equilibrium conditions
- 4. Evaluation of the staircase's bearing...
- 5. Torsional solution
- 6. Conclusions
- Acknowledgements
- References

Figures and tables

-
-
-
-
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-

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