شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

IMPACT OF INTEGRATING WIND CORRIDOR ON COMPACT URBAN MORPHOLOGIES "ANSYS FLUENT AS A CFD TOOL FOR MORE ENERGY EFFICIENT AND SUSTAINABLE DEVELOPMENT"

By

Osama Ahmed Elmassah

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
Architectural Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
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Under the Supervision of

Prof. Dr. Tarek Abdellatif Aboulata

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Professor of Regional and urban planning
Architecture Department
Faculty of Engineering, Cairo University

Prof. Dr. Mohamed Anwer Zayed

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Professor of Regional and urban planning
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Approved by the
Examining Committee

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FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2021

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Title of Thesis:

Impact of Integrating Wind Corridor on Compact Urban Morphologies
"ANSYS Fluent as a CFD Tool for More Energy Efficient and Sustainable Development"

Key Words:
Urban morphology; Wind behaviour; Wind corridor; Compact development; ANSYS Fluent.

Summary:

The research studies the relation between urban morphologies and wind behaviour in compact urban development by integrating urban interventions to create wind corridors in order to increase potentials of generating power from wind resources inside human settlements in a trial to enhance sustainability by increasing energy efficiency and decreasing carbon emissions. Impact of these design interventions on wind behaviour and speed are verified accurately by ANSYS Fluent software as a valid Computational Fluid Dynamics program. The study also concluded that early consideration of wind turbines in compact urban communities in improving energy efficiency of urban communities, enhancing the environment and reducing carbon emissions in the design phase is better than considering them after construction.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Osama Ahmed Elmassah Date: / / 2021

Signature:

Dedication

To my father - God bless his soul
To my mother and sisters
To my wife and daughter
And to the better of this country