

Introduction to Structural Engineering and Architecture

Dr. Abdollah Malekjafarian

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Discipline Information Talk



<https://sda.ucd.ie/>

<https://people.ucd.ie/abdollah.malekjafarian>

Email: abdollah.malekjafarian@ucd.ie

My Background

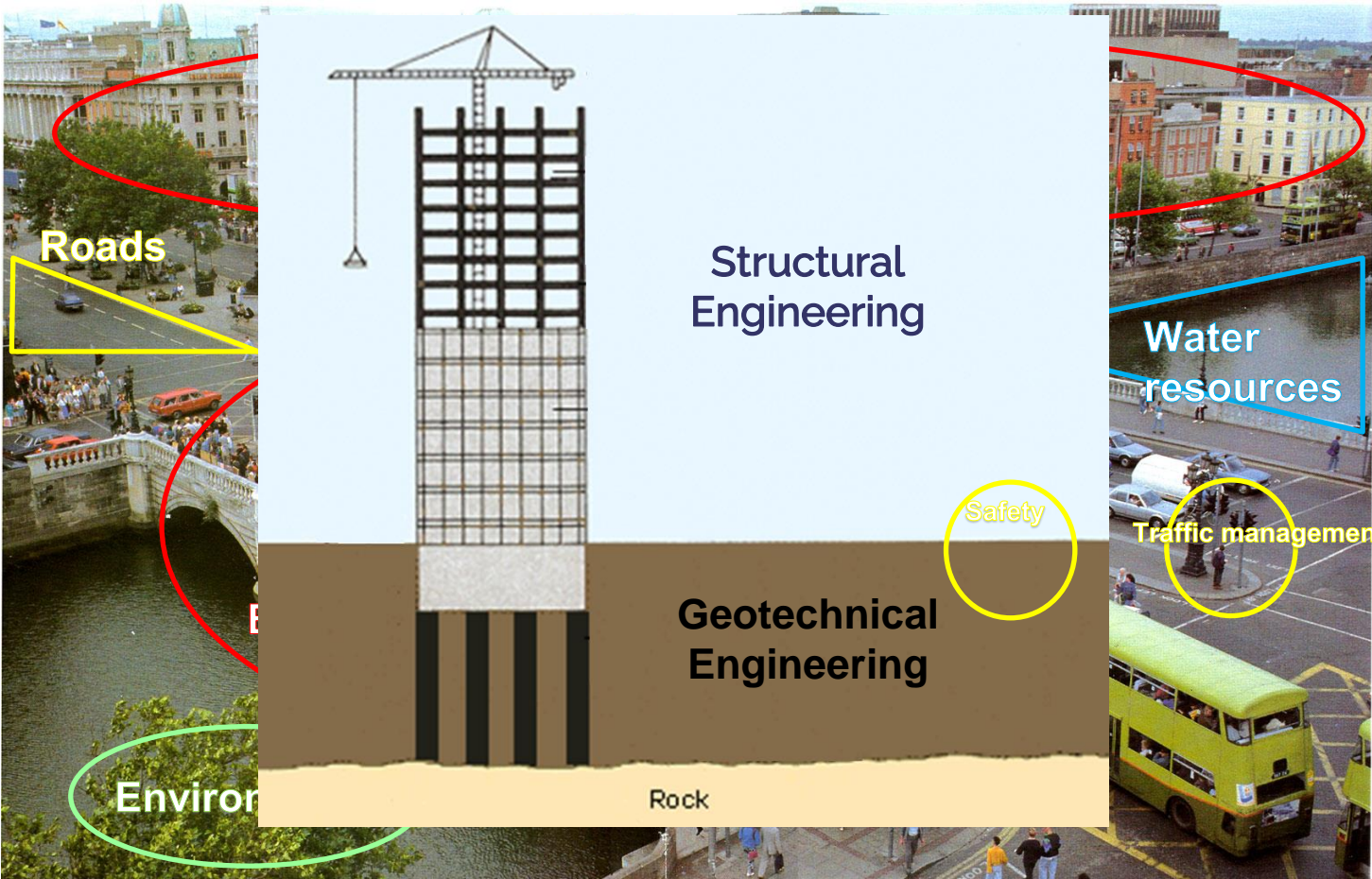


Abdollah Malekjafarian
Assistant Professor

UCD School of Civil Engineering
Structural Dynamics and Assessment
Laboratory

Civil Infrastructure!

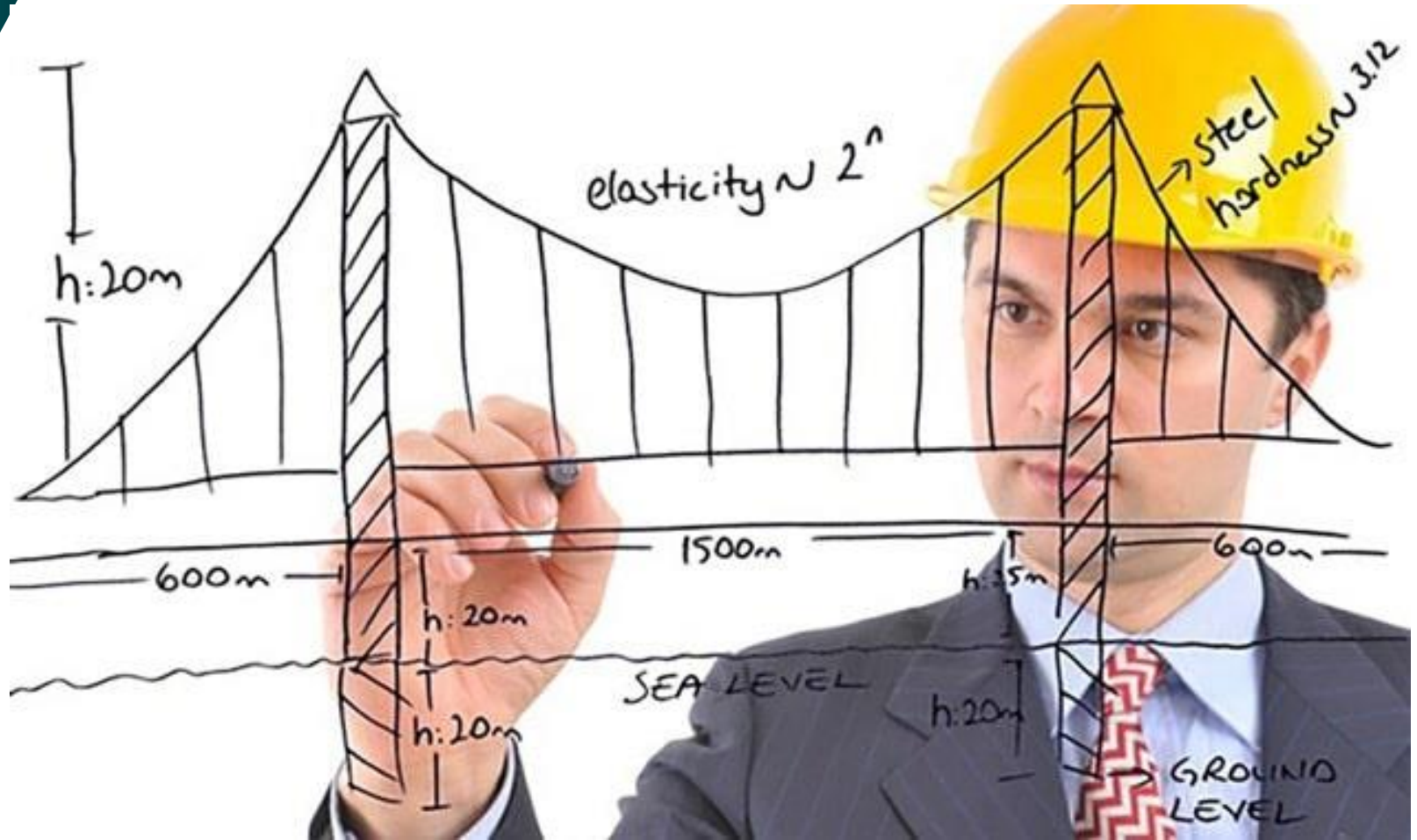
Pollution control



Structural Design



Structural Design

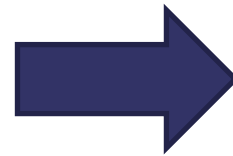
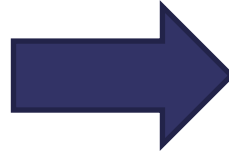




Novel Technologies in Structural Engineering



Less than an hour



A 2500 square foot house: 20 hours





Dubai plans to 3D print 25% of buildings by 2030

The new strategy will cut costs and reduce construction times, Dubai ruler Sheikh Mohammed said

Dubai will build a quarter of its structures using 3D printing technology under a new initiative revealed on Wednesday to make the emirate a hub for the technology.

UAE Vice President and Prime Minister and Ruler of Dubai, HH Sheikh Mohammed bin Rashid Al Maktoum said the emirate's '3D printing strategy' was part of plans to achieve global leadership in future





What is Structural Engineering with Architecture?

The Architect's solution vs the Engineer's solution

- The one is beautiful, but infeasible vs the one which is feasible and cheap, but not good-looking!



What is Structural Engineering with Architecture?

- You will be **ENGINEERS** who do the technical calculations.
- **BUT**, you will also be able to speak the language of **Architects**.
- You will appreciate what **Architects** are trying to achieve.
- And you can help them to **deliver it**.





What you study in Structural Engineering with Architecture?

The modules



Stage 1

- Physics
- Chemistry
- Calculus
- Energy
- Mechanics
- Creativity

Stage 2

- Theory & Design of Structures
- Construction Practice
- Mechanics of Solids
- Soil Mechanics 1
- Fluid Mechanics

Stage 3

- Soil Mechanics 2
- Analysis of Structures
- Energy Systems
- Design of Structures
- Imagining Architecture

Stage 4

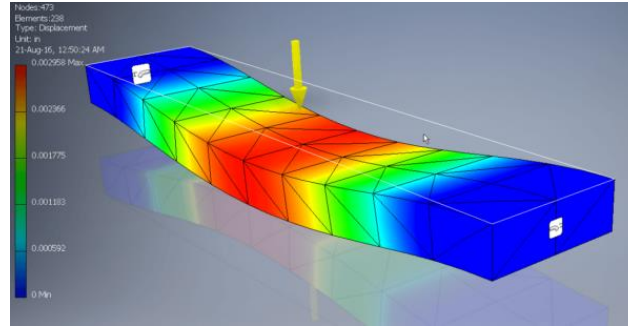
- Internship
- Structural Analysis
- Structural Dynamics
- Geotechnical Engineering
- Civil Engineering Systems

Stage 5

- Bridge Engineering
- Advanced Structural Analysis
- Case Studies
- Thesis
- Innovation Leadership

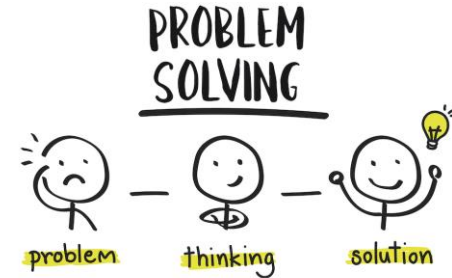
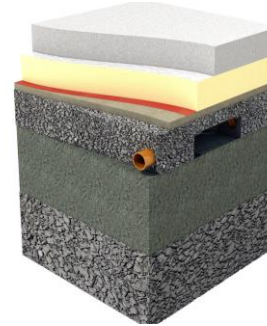
What will you learn?

Architecture



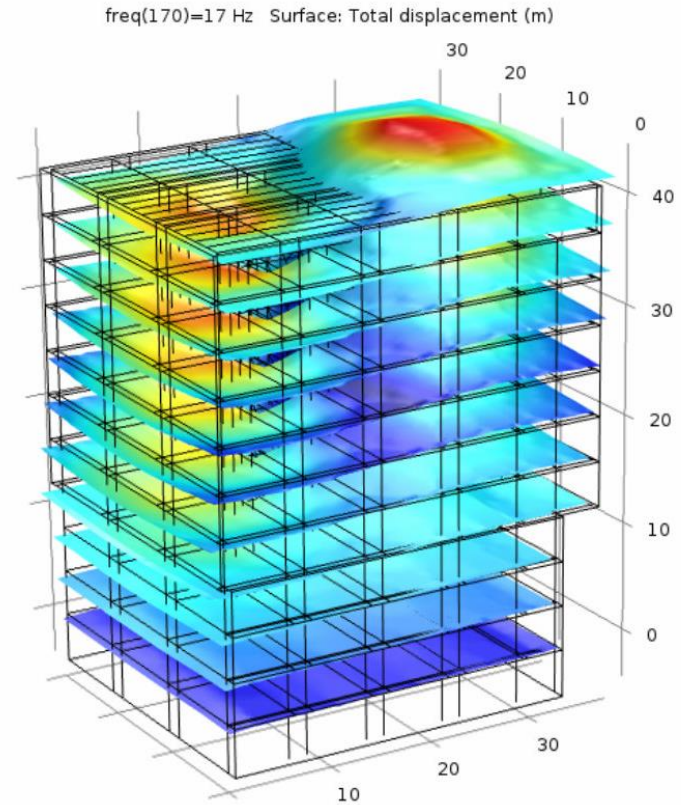
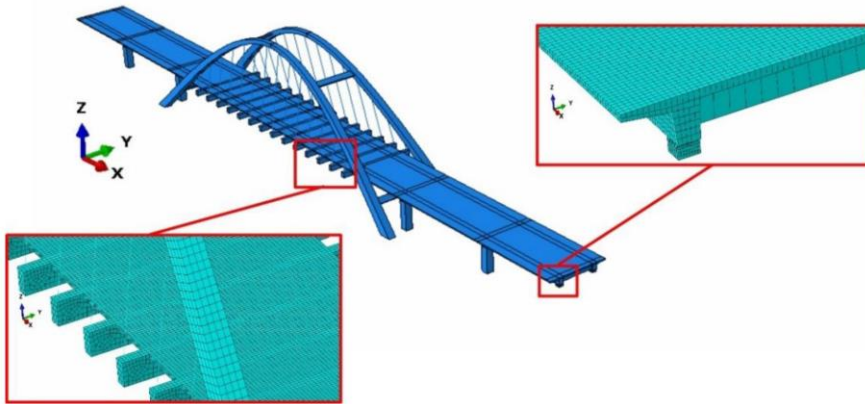
Design and Analysis

Material



Problem Solving

Research Project- Thesis





Internship

- **This is an opportunity to see how you can use what you learned in Practice!**



The background is a solid dark blue color. In the top-left corner, there is a white rounded square. In the top-right corner, there is a teal rounded rectangle. In the bottom-left corner, there is a teal rounded rectangle with an orange rounded rectangle overlapping it. In the bottom-right corner, there is a white rounded square.

Job Opportunities



Public Sector and Government



Private Sector



It is a portable degree, there are loads of opportunities all over the world.



Singapore



Qatar



Canada

Thanks!



Structural Engineering with Architecture UCD

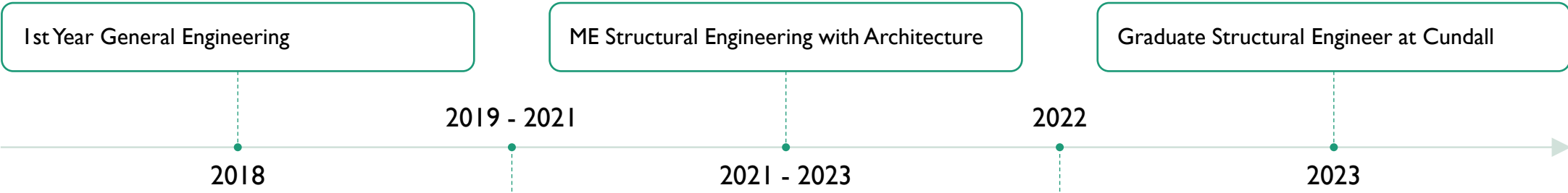
Ciara Neeson
2023 Graduate



About Me



CUNDALL



BSc Structural Engineering with Architecture

8-month internship with Meinhardt UK



Why I chose Structural Engineering



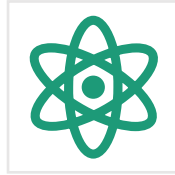
LC SUBJECTS

Biology
DCG
German
Economics



INTERESTS

Architecture
Design
Maths



1ST YEAR MODULES

Liked:

- Mechanics
- Creativity in Design
- Maths Modules
- Energy Engineering

Disliked:

- MATLAB
- Elec
- Chemistry
- Quantum Physics



Undergrad – Years 2 & 3



2nd Year Modules

Construction Materials
Construction Practice
Computing in Civil
Engineering
Design & Communications
History of Architecture



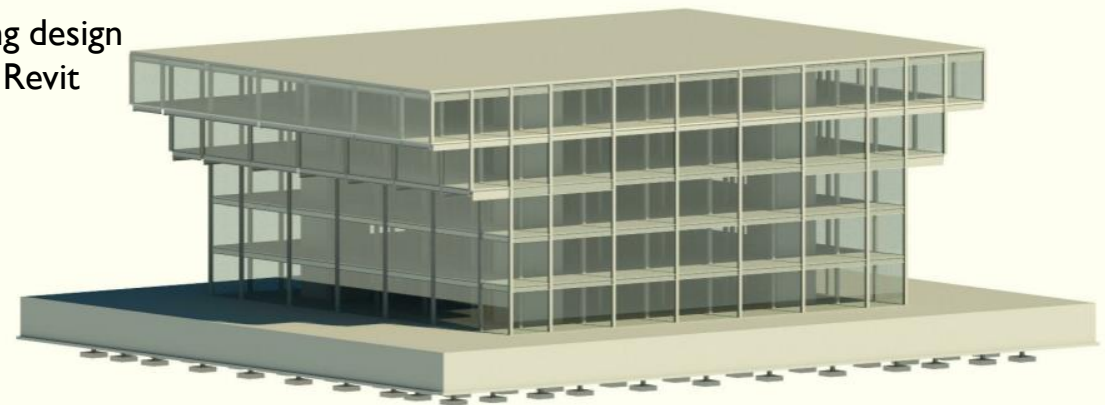
3rd Year Modules

Analysis of Structures
Design of Structures
Geotechnics
History of Architecture
Energy Systems in Buildings
Group Design Project



Group Projects

Build a chair
Scheme design with
architects
Build a play structure
Year-long building design
project using Revit



Masters – Years 4 & 5



4th Year Modules

Geotechnics
Analysis of Structures
Advanced Materials
Dynamics
Innovation Leadership
8 month internship



5th Year Modules

20 credit research project
Case Studies
Bridge Engineering
Design of Structures
Design/Build
Management



Group Projects

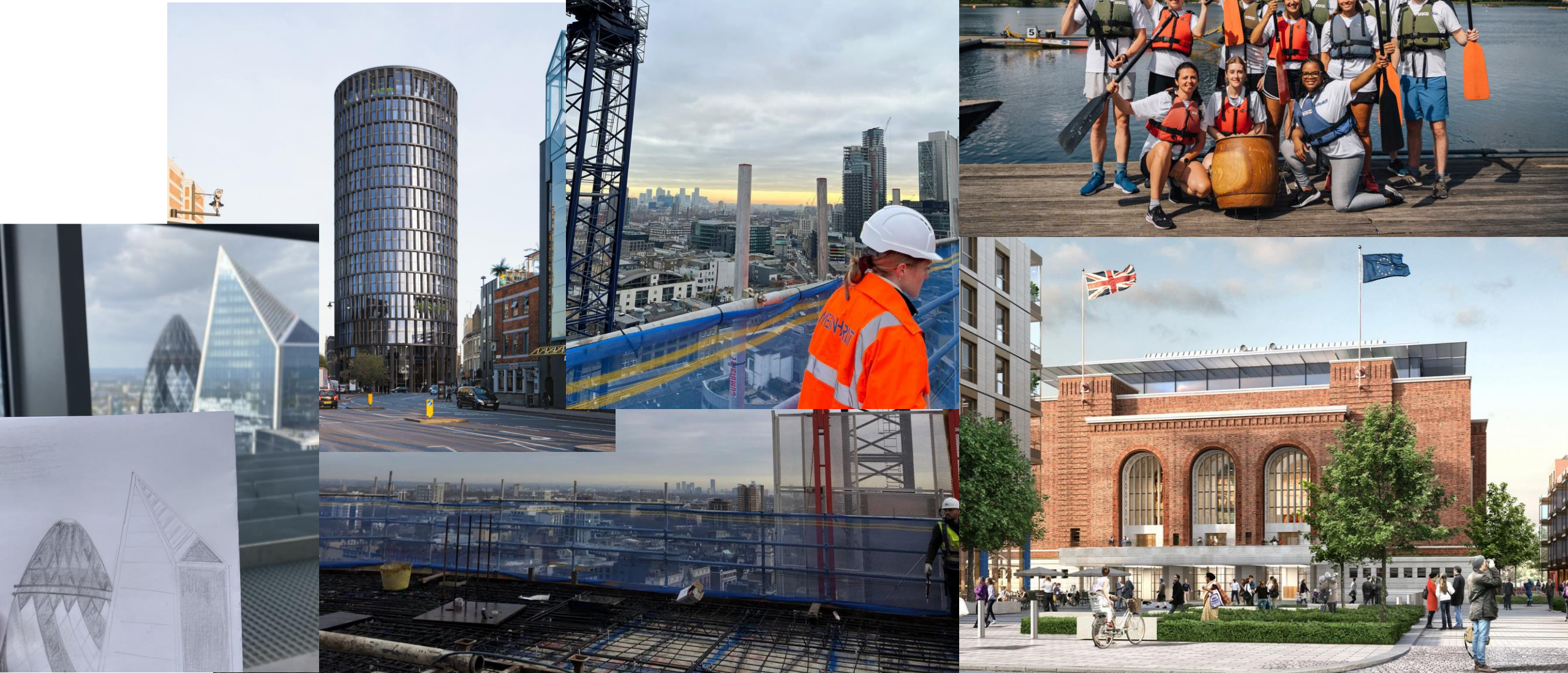
Build a structure for the public with architects
Tutor Creativity in Design for 1st years
Weekly case studies

- **ME Options**
 - Structural Engineering with Architecture
 - Civil Engineering with Business
- **NOTE** – you cannot do a BEng with Structural!



MEINHARDT

4th Year Internship in London office

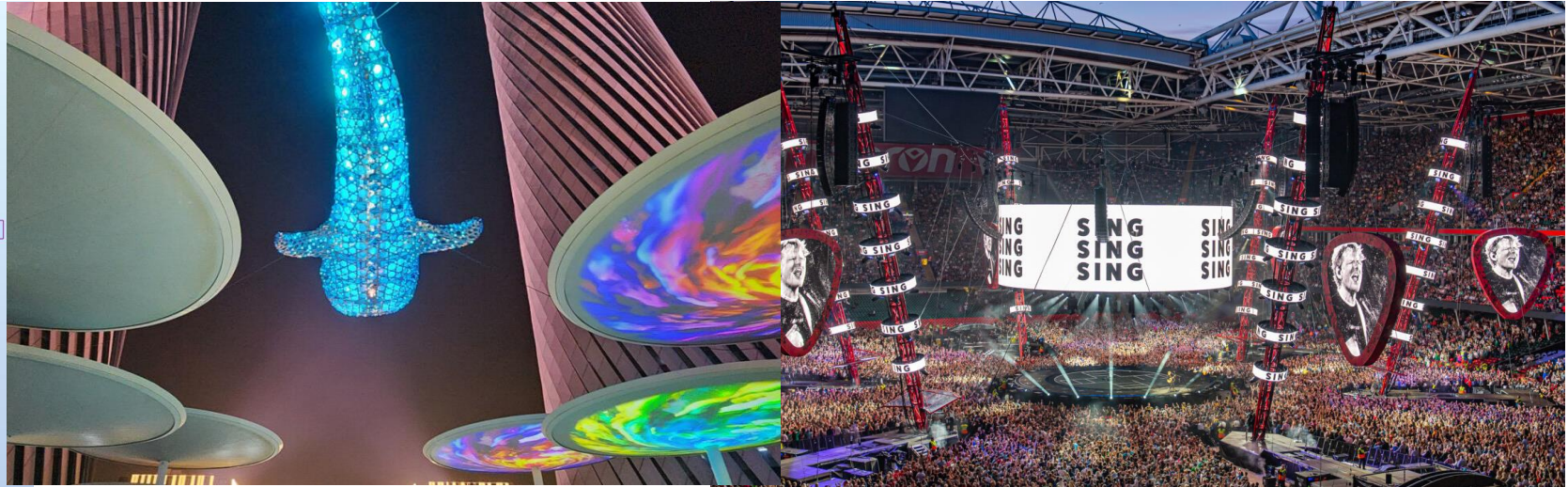
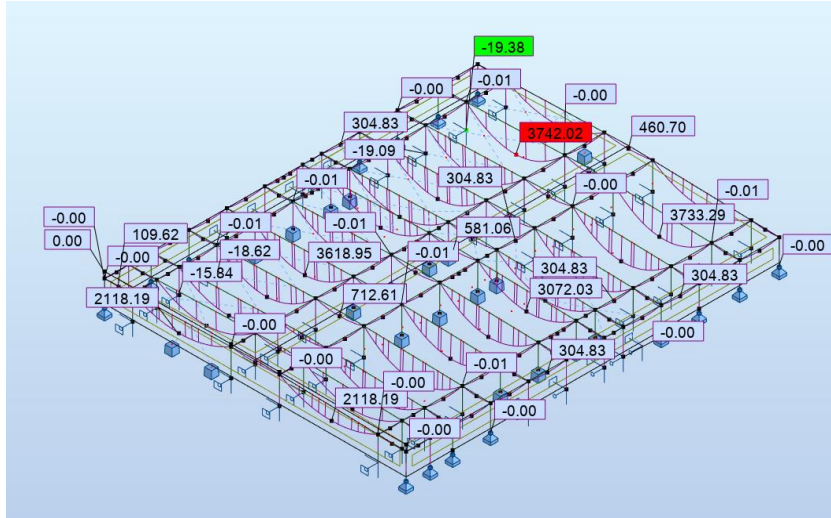


Newstead

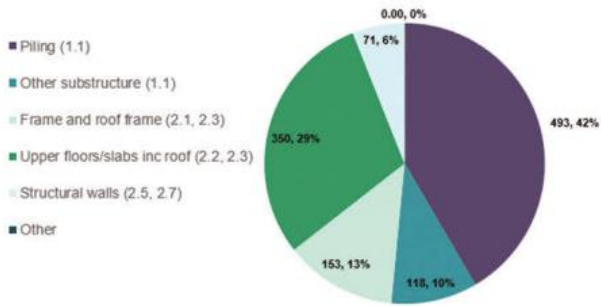
- The revival of Civil & Structural Society
 - Promoted socialising between years
 - Hosted our own careers night in Newstead just for civil/structural
 - Got close with contacts in the industry
 - Companies sponsored social events & talks
- Course trips to Budapest, Edinburgh & Kerry
- Close relationship with staff
 - Tag rugby verses the lecturers
 - Coffee mornings with lecturers
- Quiet building – kitchen, study room, computer room



Graduate Structural Engineer



Scheme A - Element emission breakdown [tCO₂e]

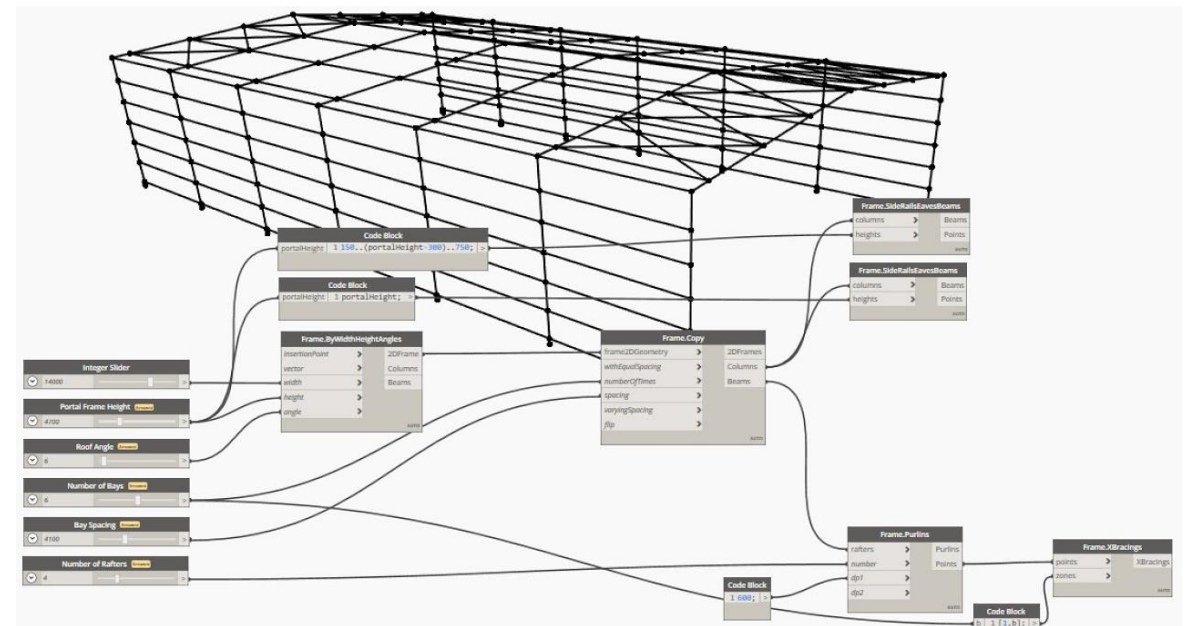


This project scheme releases carbon equivalent to:

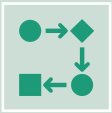
- 1,416 one-way flights from London to New York
- 708 people's consumption of meat, dairy and beer for 1 year
- 390 average family cars running for 1 year

Scheme performance against targets:

- SCORS: 137 kgCO₂e/m² Scheme does not meet target
- RIBA: 156 kgCO₂e/m² Scheme does not meet target
- LETI: 0 kgCO₂e/m² Target N/A



SUMMARY



3 Year BSc + 2 Year ME



Mechanics & Analysis of Structures, 1 architecture module per semester



Newstead > Eng Building



Jobs in Structural, Civil, Geotechnical, Sustainability & Project Management roles



International opportunities



DON'T follow your friends!
Do what makes you happy.



Q&A



Ciara Neeson



ciara.neeson@ucdconnect.ie