Welcome

Week 3 – Introduction to conceptual design for structural engineers

11:30am – 1:30pm London time

think up

Your host

Oliver
Broadbent

Contents

1

Orientation & Contracting

Orientation

- **'Raise your hand'**, **'Agree/Disagree'** and **'Laugh'** using **'set status'**

Orientation

- **'Raise your hand', 'Agree/Disagree' and 'Laugh' using 'set status'**
- **Ask questions in 'Chat'**

Orientation

- **'Raise your hand', 'Agree/Disagree' and 'Laugh' using 'set status'**
- **Ask questions in 'Chat'**
- **See who is talking in 'Attendees'**

Orientation

- **'Raise your hand', 'Agree/Disagree' and 'Laugh' using 'set status'**
- **Ask questions in 'Chat'**
- **See who is talking in 'Attendees'**
- **'Mute your mic' when you are not talking**

Contracting:
Q1

What do you want out of this training?

- Gain a better understanding of what conceptual design actually mean

- Be better prepared for the IStructE exam

- Gain some useful Conceptual Design tools and techniques

- Gain efficiencies, better process

- Increase your scope to influence conceptual design on projects

Contracting:
Q2

What can you offer other people?

- **What can you offer? Sharing experiences with others including experience of having sat the IStructE exam**

- Sharing tools and techniques you already use…

- Knowledge and experience of design and delivery workflow

- Project-specific experience

Contracting:
Q3

How might you sabotage it?

• It's late!

• Feeling ungenerous, unwilling to share ideas etc.

That's our contract to each other

- Our terms of engagement
- We will review these every session

2

What is conceptual design?

What is conceptual design?
Switch to breakouts

Breakout instructions

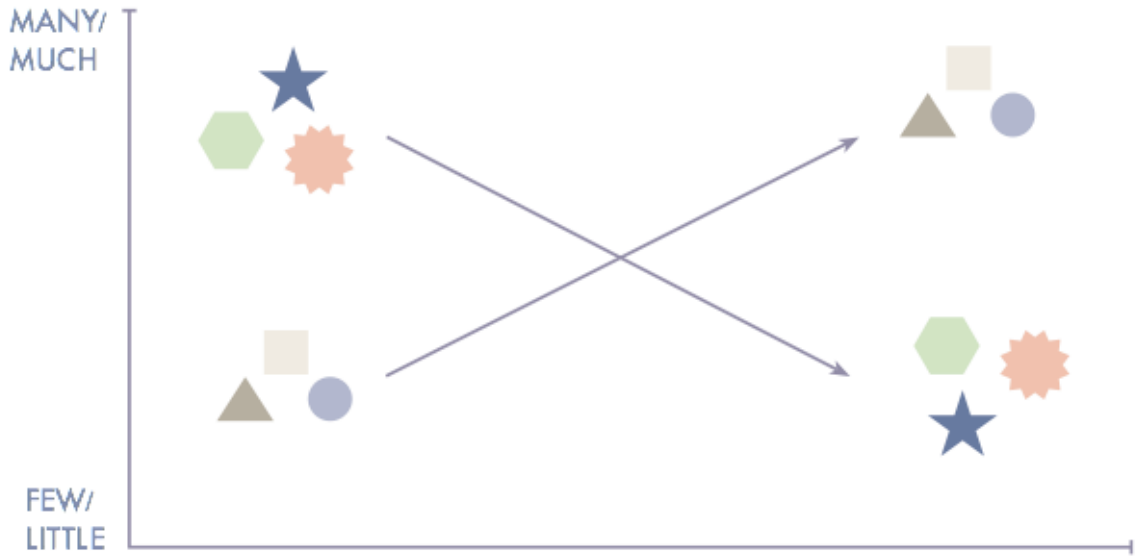- Brainstorm what is conceptual design

What is conceptual design?
Switch to main layout

What is conceptual design?

What is conceptual design?

What is conceptual design

- Early stages in the overall design process
- Time at which key design decisions are made which define the nature of the outcome
- Key systems identified
- Time at which big changes are possible
- Time at which information is incomplete
- Time of greatest opportunity for designers.

3

Review of last week

Breakout instructions

- Write a recipe for having ideas
- Be ready to present it to the other groups

Review of last 2 weeks
Switch to breakouts

Breakout instructions

- Write a recipe for having ideas
- Be ready to present it to the other groups

Review of last 2 weeks
Switch to main layout

Recipes for having ideas

An idea is a new connection between existing elements in the mind

Control two things:
1. The information in the mind
2. How we form new connections

Three sources of information

1. The brief

2. Professional knowledge

3. Outside interests

How can we mix the information in our minds to create new connections?

1. Ask 'what if?'

2. Change the key system

3. Draw from a different perspective

4

How do we know if our ideas are good?

How do we know if our ideas are good?

Our ideas must meet all the requirements of the brief

What if we meet all the requirements and the idea still is no good?

Then the brief needs more adding to it.

The Designer's Paradox

The client doesn't know what they want until they know what they can have. You don't know what the answer will necessarily look like until you have started designing.

Desirable

Achieveable

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Models and tests

Relating the brief to our ideas

Relating the brief to our ideas

1. The brief is a set of design criteria

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1. The brief is a set of design criteria

2. For each criteria there is a test

Relating the brief to our ideas

1. The brief is a set of design criteria

2. For each criteria there is a test

3. The tests are applied to models

Relating the brief to our ideas

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4. Models are expressions of ideas

Relating the brief to our ideas - example

1. The brief is a set of design criteria

2. For each criteria there is a test

3. The tests are applied to models

4. Models are expressions of ideas

Relating the brief to our ideas - example

1. The brief is a set of design criteria [must be stable]
2. For each criteria there is a test

3. The tests are applied to models

4. Models are expressions of ideas

Relating the brief to our ideas - example

1. The brief is a set of design criteria [must be stable]
2. For each criteria there is a test [Mover<=Mres]
3. The tests are applied to models

4. Models are expressions of ideas

Relating the brief to our ideas - example

1. The brief is a set of design criteria [must be stable]
2. For each criteria there is a test [Mover<=Mres]
3. The tests are applied to models [model is a structural model]
4. Models are expressions of ideas

Relating the brief to our ideas - example

1. The brief is a set of design criteria [must be stable]
2. For each criteria there is a test [Mover<=Mres]
3. The tests are applied to models [model is a structural model]
4. Models are expressions of ideas [express ideas as structural models]

Relating the brief to our ideas – example 2

1. The brief is a set of design criteria

2. For each criteria there is a test

3. The tests are applied to models

4. Models are expressions of ideas

Relating the brief to our ideas – example 2

1. The brief is a set of design criteria [must be beautiful]
2. For each criteria there is a test

3. The tests are applied to models

4. Models are expressions of ideas

Relating the brief to our ideas – example 2

1. The brief is a set of design criteria [must be beautiful]
2. For each criteria there is a test [test of symmetry]
3. The tests are applied to models

4. Models are expressions of ideas

Relating the brief to our ideas – example 2

1. The brief is a set of design criteria [must be beautiful]
2. For each criteria there is a test [test of symmetry]
3. The tests are applied to models [elevation drawing]
4. Models are expressions of ideas

Relating the brief to our ideas – example 2

1. The brief is a set of design criteria [must be beautiful]
2. For each criteria there is a test [test of symmetry]
3. The tests are applied to models [elevation drawing]
4. Models are expressions of ideas [express idea as an elevation]

We need to establish tests and models for each of our design criteria

Table of tests and models

Design criteria in the brief	Associated test	Associated model	Pass/fail
1			1
2			2
3			3
4			4
5			5

Breakout instructions

- Enter one of the design criteria from the brief into the table

- Identify the associated test and the model to which that test applies

- Complete the table for more criteria.

- Try to consider objective and subjective criteria.

Tests and models
Switch to breakout review

Breakout instructions

- Enter one of the design criteria from the brief into the table

- Identify the associated test and the model to which that test applies

- Complete the table for more criteria.

- Try to consider objective and subjective criteria.

Tests and models
Switch to main layout

Discussion

1. What tests are common

2. What tests are difficult?

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Iterative idea development

Design is iterative. How can we use tests iteratively to improve our ideas?

Iterative idea development

1. Establish the list of tests and models

Iterative idea development

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2. Do the tests on an idea version 1.0

Iterative idea development

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3. Which tests are pass/fail?

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3. Which tests are pass/fail?

4. Adjust the idea to create version 1.1

Iterative idea development

1. Establish the list of tests and models

2. Do the tests on an idea version 1.0

3. Which tests are pass/fail?

4. Adjust the idea to create version 1.1

5. Re-run the tests and repeat

Breakout instructions

- Go back to your lists of tests and models

- Quickly do each test (split these up between you)

- Fill in the pass/fail list

- Choose an aspect of the design to change that will enable the idea to pass

- Re-run the tests

- See how many iterations you can run

Iterative idea development
Switch to breakout review

Breakout instructions

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Iterative idea development
Switch to main layout

What happened when you applied tests iteratively?

Iterative testing

1. Good way to structure your thinking

2. Remember the Designer's Paradox: the brief criteria may need updating

3. Challenge is knowing when to stop

How will use this technique in the exam?

How can you prep this technique?

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Workwork

Workwork

Keep a daily testing diary

- **For the design task you are working on that day**

- **How are you choosing and applying the appropriate tests?**

- **See the example on the next slide**

- **Send a scan of your daily briefing diary if you want us to comment on it to:**
  info@thinkup.org

- **Send scans by Monday 30th April at 5pm London time**

Workwork

Day	Task	Test used	Associated Model
Tuesday			
Wednesday			
Thursday			
Friday			
Monday			

Details of the next session...

Next session

- 11:30am – 1:30pm London time
- Please log on half an hour earlier to make sure your audio is working correctly.

Thank you!

think up