The University Of Sheffield.

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Developing communication skills - drawing: Using peer assessment and marking for student engagement

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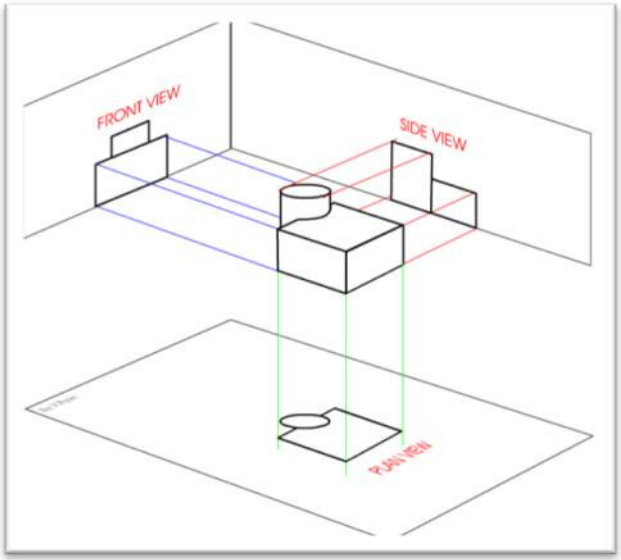
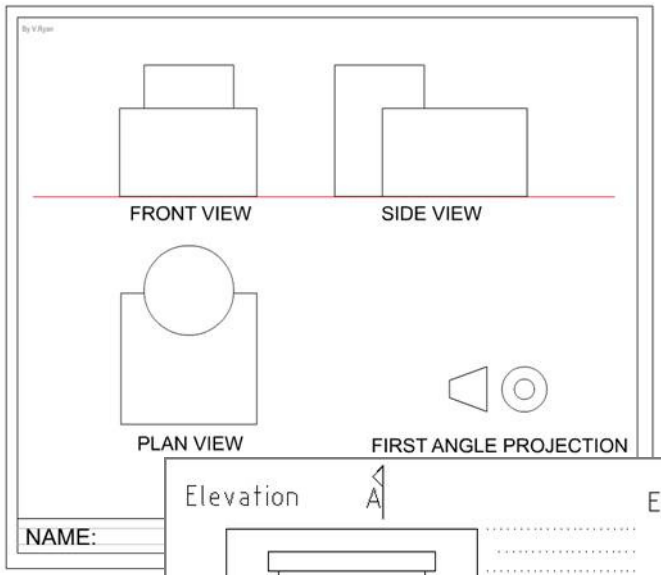
Developing drawing skills

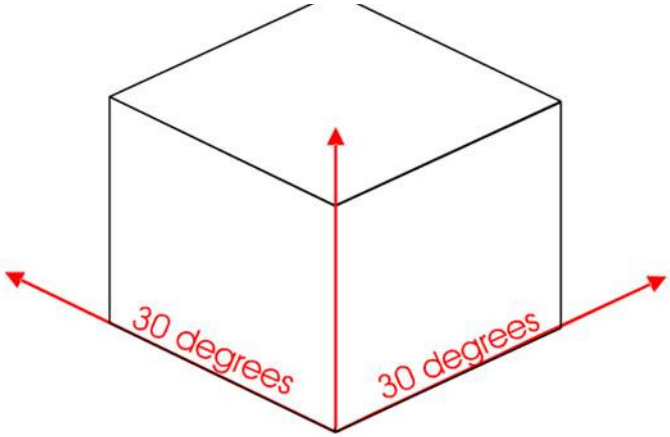
- Year 1: Skills module
  - Hand sketching & AutoCAD
- Year 1: Introduction to design module
  - Hand sketching & structural form / observation of real structures
- Year 3: Group design project

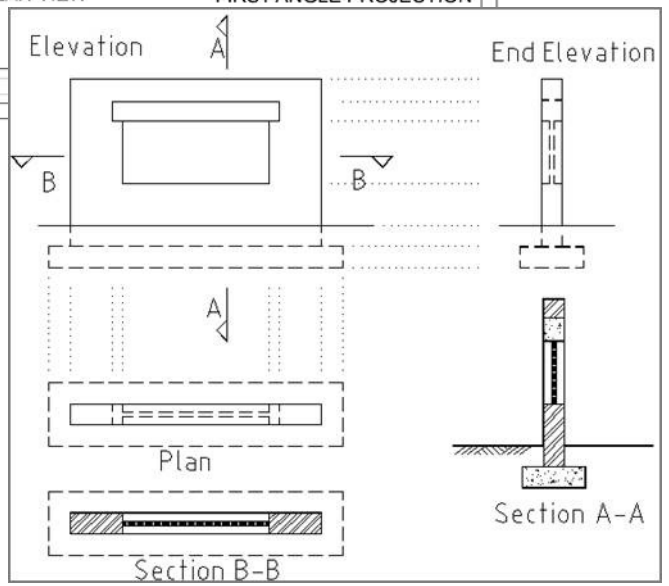
Y1 drawing exercises

Isometric / orthographic / sections… Lego make, draw and build from someone else's drawings









Y1 main assessed drawing task …

AutoCAD sections & detail: portal frame building

- Complicated brief, with more detail than necessary
  - General outline of the structure – communicate sections and detail to design team
  - Read, interpret, identify key elements…
  - Balance between enough and too-much detail
  - Appropriate detail and dimensions
  - Use of layers
  - Concise descriptive text in support

Aim: Interpret drawings – appropriate layout and detail

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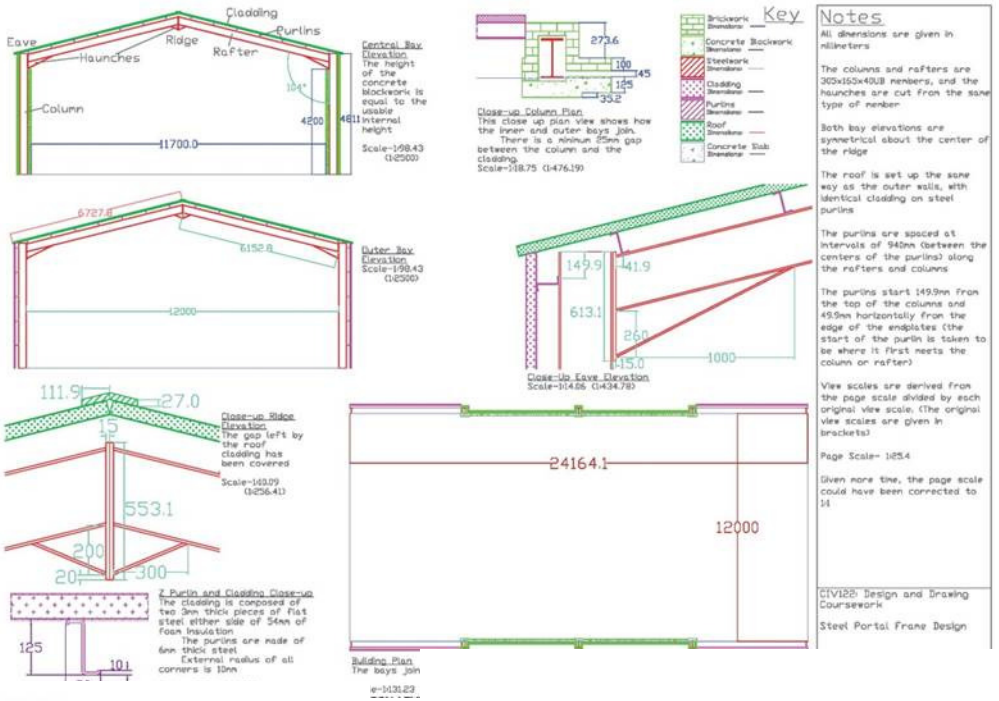
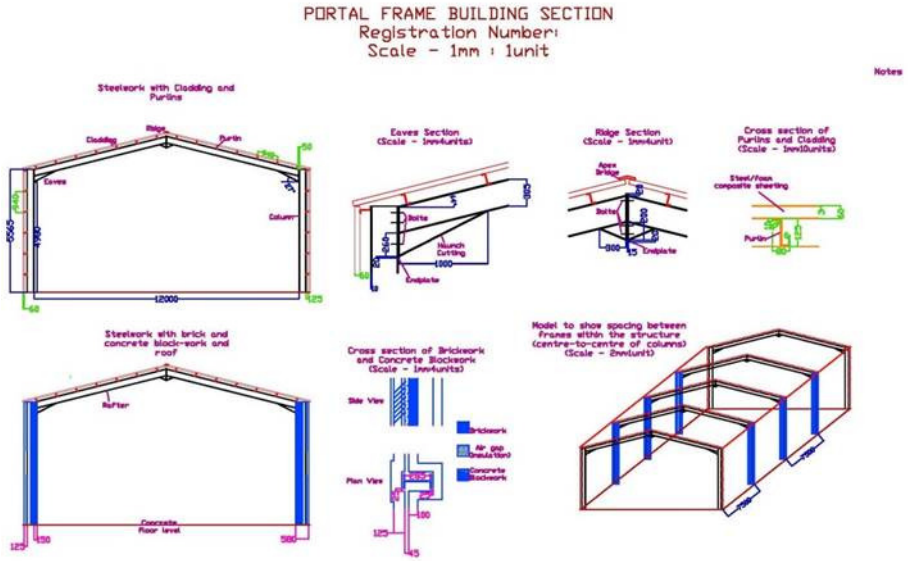
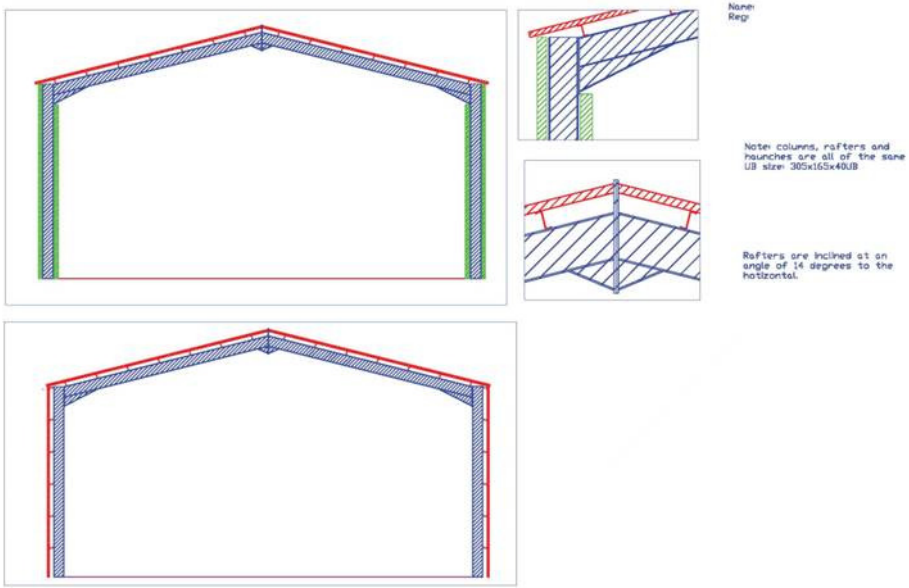
The Task







The Problem

- Class size ~150 students
- Range of ability & amount of feedback required
- Time required to give detailed feedback, so…
  - Fewer useful comments?
  - Feedback remote (in time) from task?
- Lack of student engagement with assessment criteria and feedback
  - missed learning opportunity

http://chipsofbrookfield.files.wordpress.com/2012/10/marking_mug_visual.jpg

The solution:
Peer assessment & marking

- Turnitin Peermark
  - Facilitates assessment distribution / collation
  - Shows criteria & performance levels
  - Facilitates giving and marking feedback – students and staff

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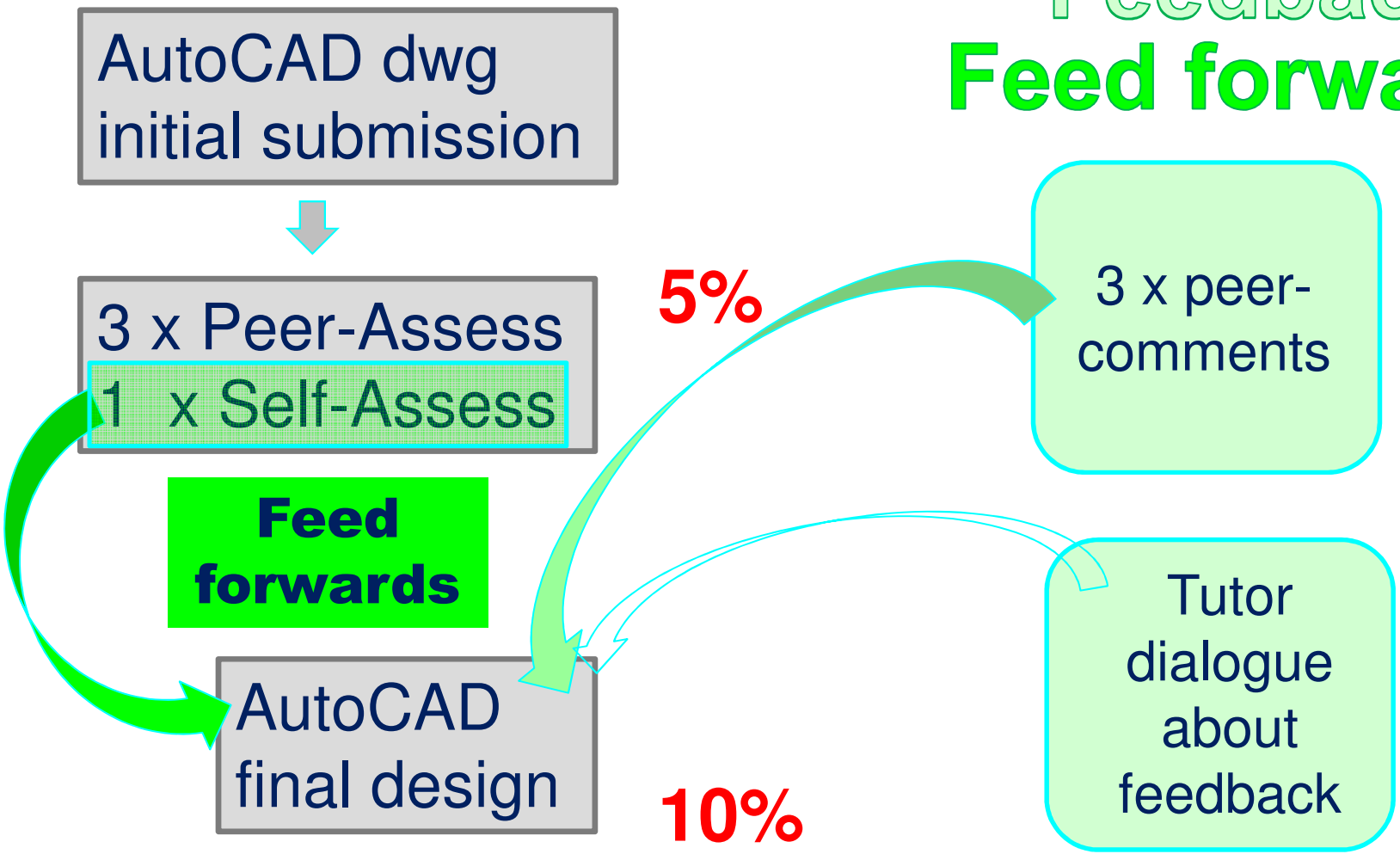
Assessment, Marks & Formative ~~Feedback~~ Feed forwards



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BUT

- Students need training to peer assess effectively
  - So… in-class session to develop understanding using electronic voting system
    - Enables understanding of assessment criteria and quality / performance levels

Assessment Criteria

- Does the drawing meet the requirements of the brief
- Is the drawing laid out clearly?
- Have the hidden detail and hatching been used appropriately
- Is the drawing adequately dimensioned?
- Does the drawing have a title, scale(s) and annotations?
- Has the student shown good judgement and accuracy when creating the drawing?

Peer assessment & training

- Class session - Three examples used to train students:
  - Example 1 - students rate example against each assessment criterion (same criteria as for their assignment)
    - Wide range of assessed marks.
    - Follow with class discussion about assessment…
  - Example 2 – rate against criteria
    - More agreement in assessment.
    - Follow with further class discussion…
  - Example 3 – rate against criteria
    - Most agreement in assessment .

- Peer assessment
  - Via VLE – instructions given on VLE (with example comments)
  - Each student assesses (marks and comments) 3 x peer assignments + 1x self assessment on Turnitin (within VLE).

Peer assess't & feedback

- Assignment feedback returned to students via VLE
- Tutor reviews and marks feedback (on VLE) (5% of module)
- Class discussion with tutor
- Feed-forward
  - (Some) students use peer comments, self assessment (and tutor discussion) to improve submission prior to final marking
- Tutor marks final submission (10% of module)

  ~50% of average peer- and self- marks within 10% of final tutor mark

  ~80% of average peer and self- marks within 20% of final tutor mark

Conclusions

- Time saving for marking – formerly 1 week, reduced to > 1 day
- Opens up **dialogue** on feedback – all students engage – **feeds forward** to summative assessment
- Better understanding of assessment criteria
- Excellent quality feedback comments

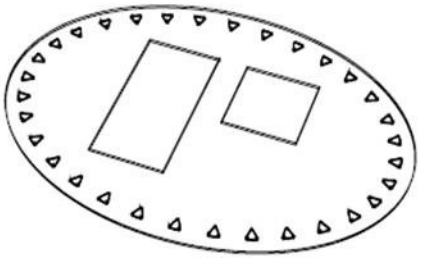
- Contact Sam Clarke –sam.clarke@sheffield.ac.uk for more information

Y3 Design Project

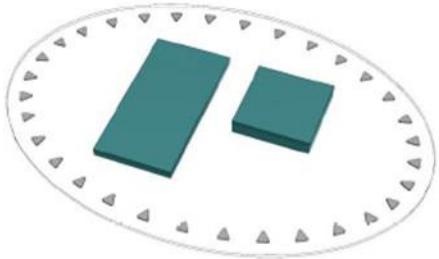
- Major design project – students work in groups
  - Long-span structure, bridge, contaminated land, deep foundations, drainage
  - Concept to “detailed” design (full time throughout semester 2)
  - Various activities / design iterations… design project culminates in group report on all aspects of the project including drawings, outline construction plan etc

Sports centre -long-span bldg

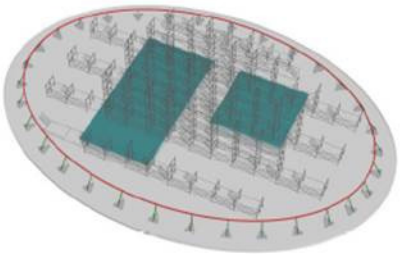
Concept, detail, construction methods…



Step 1: Pool excavations and pile installation.



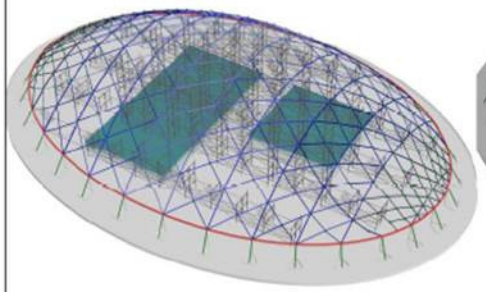
Step 2: Construct pools and erect formwork on to the site.



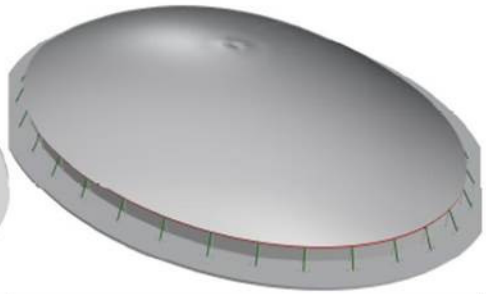
Step 3: Cast in inner and outer columns simutaneously. Then ring beam and interior structure

Notes:

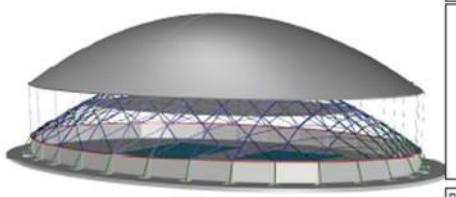
Refer to Column Details drawing for set-out of columns and section details



Step 4: Connect sections of hubs of members together. Crane the sections into place starting from the sides towards the middle.
*Refer to Construction Details for futher details



Step 5: Install tensotherm on the dome and ETFE membranes onto the inner column frames.



Step 6: Install the ETFE membrane at 15m from ground inside the dome. This is to reduce the volume of air to be heated and maximise energy efficiency.

NB: The tensotherm is exploded to illustrate the position of the ETFE.

Project

NEEPSEND REDEVELOPMENT

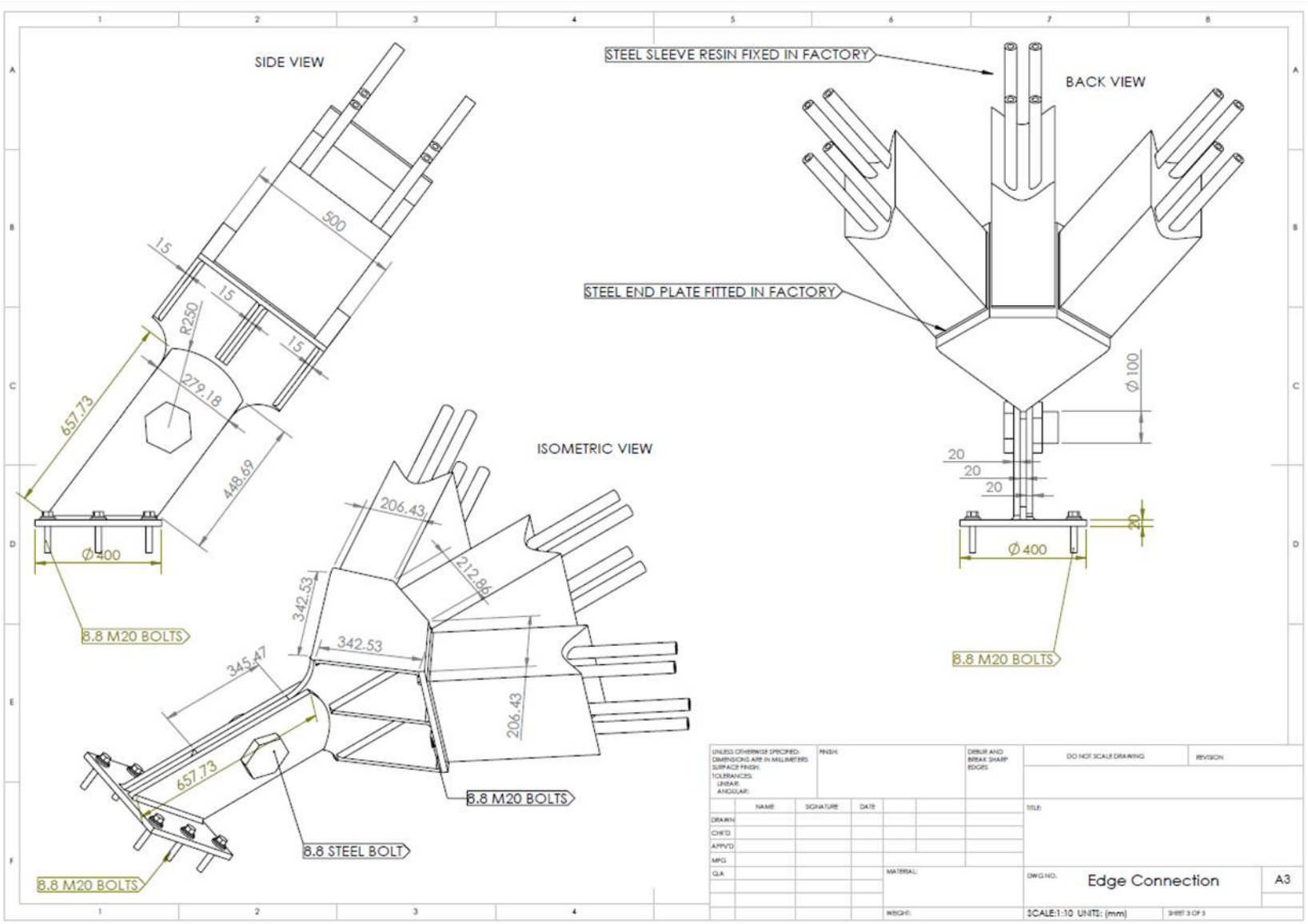
Drawn By: Checked By:

Title

Construction Sequence of Sports Centre

Scale: N/A-Drawing for Illustration Purpose Only

Connection details – how is it constructed?



Model-building
= final assignment – 1 week full time

"Your client is keen to test the accuracy and clarity of drawings produced by another consultant prior to issuing drawings for tender. They are also keen to use the physical models as a marketing tool to attract tenants or new owners to the completed project. Therefore they have also commissioned you to construct a physical model of the sports centre. This shall either be a cut-away model of the full building, or a model of half of the building, in order that the internal structure, as well as the external cladding / roofing, can be seen.

Models should be built at an appropriate scale, as determined by each group."

Groups construct the model based on **another group's** design drawings

Groups **evaluate each other's** communication, information, accuracy and drawing interpretation

Model making workshop given by the Architecture Department …

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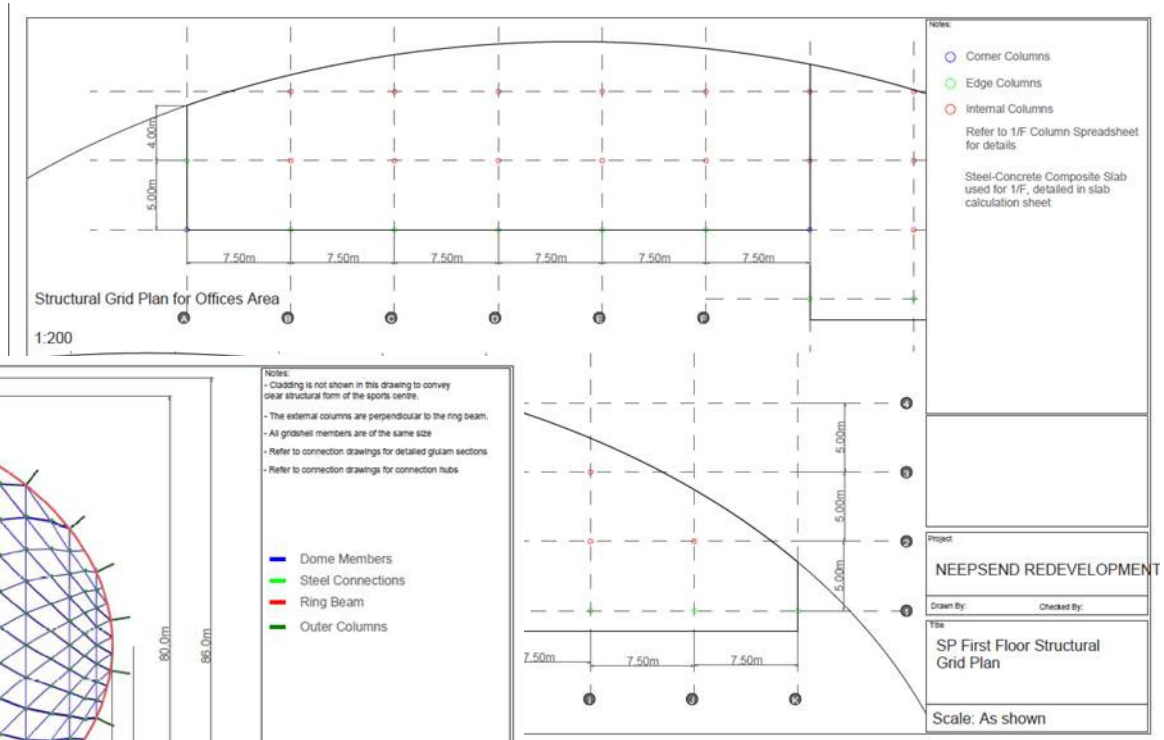
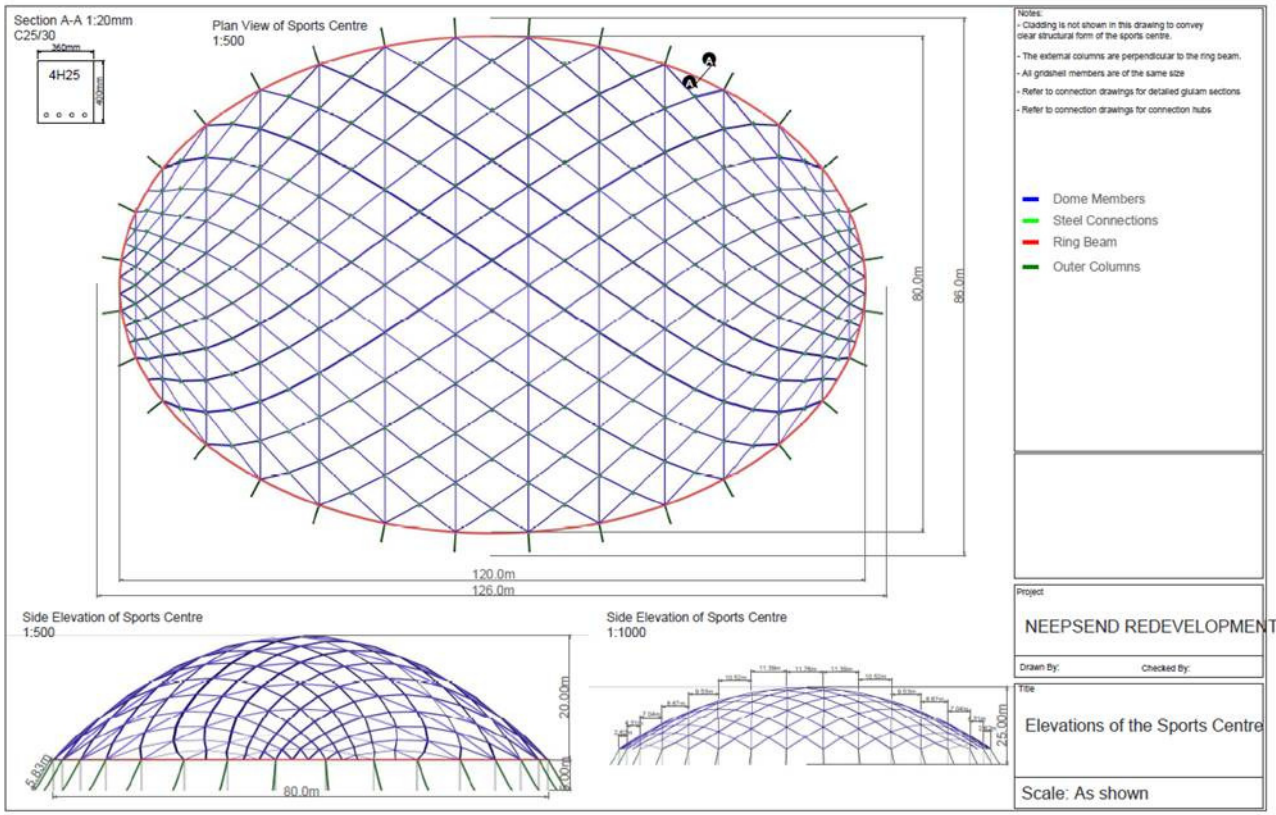
Information & communication

Drawings missing details / information?





…RFI to other team

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The models…

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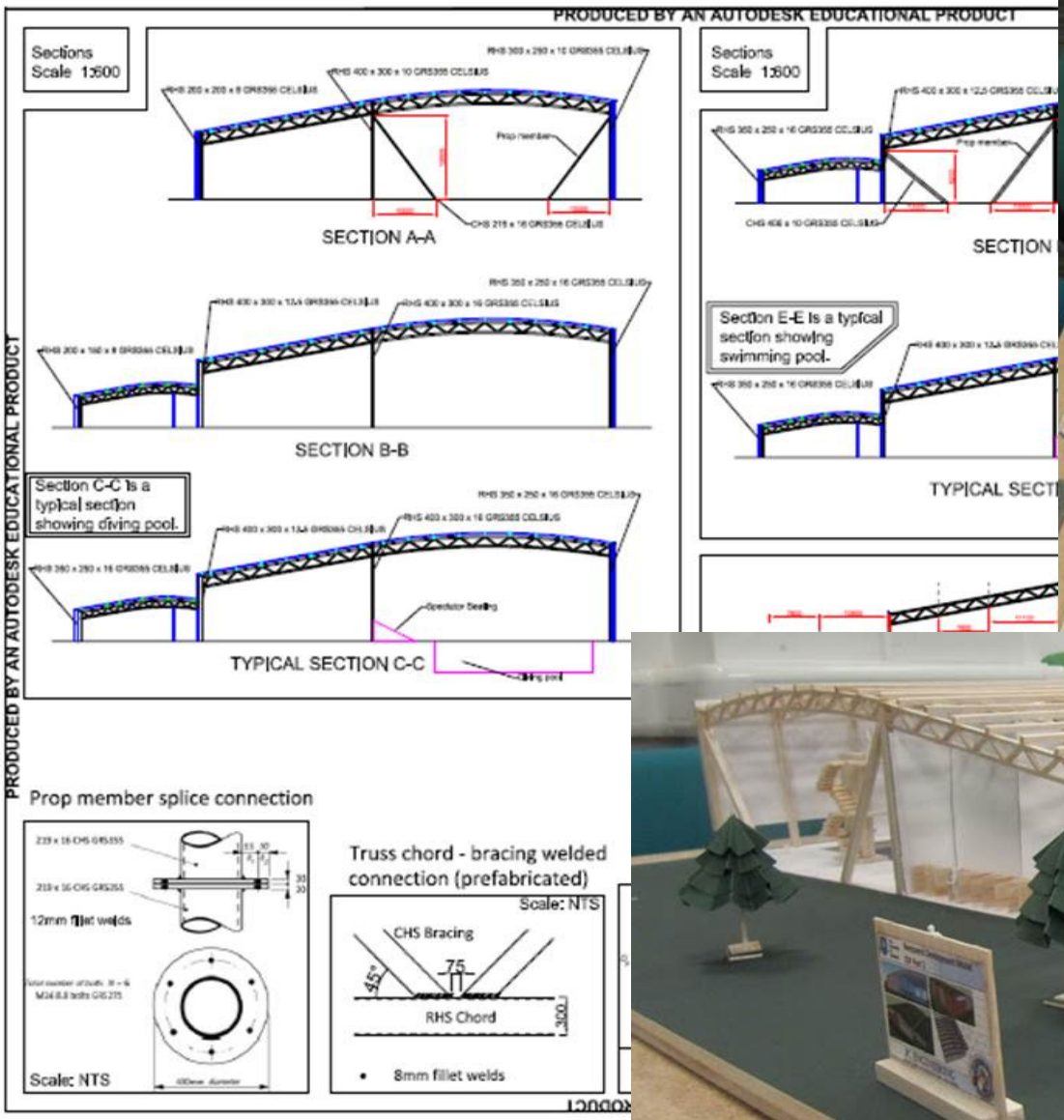
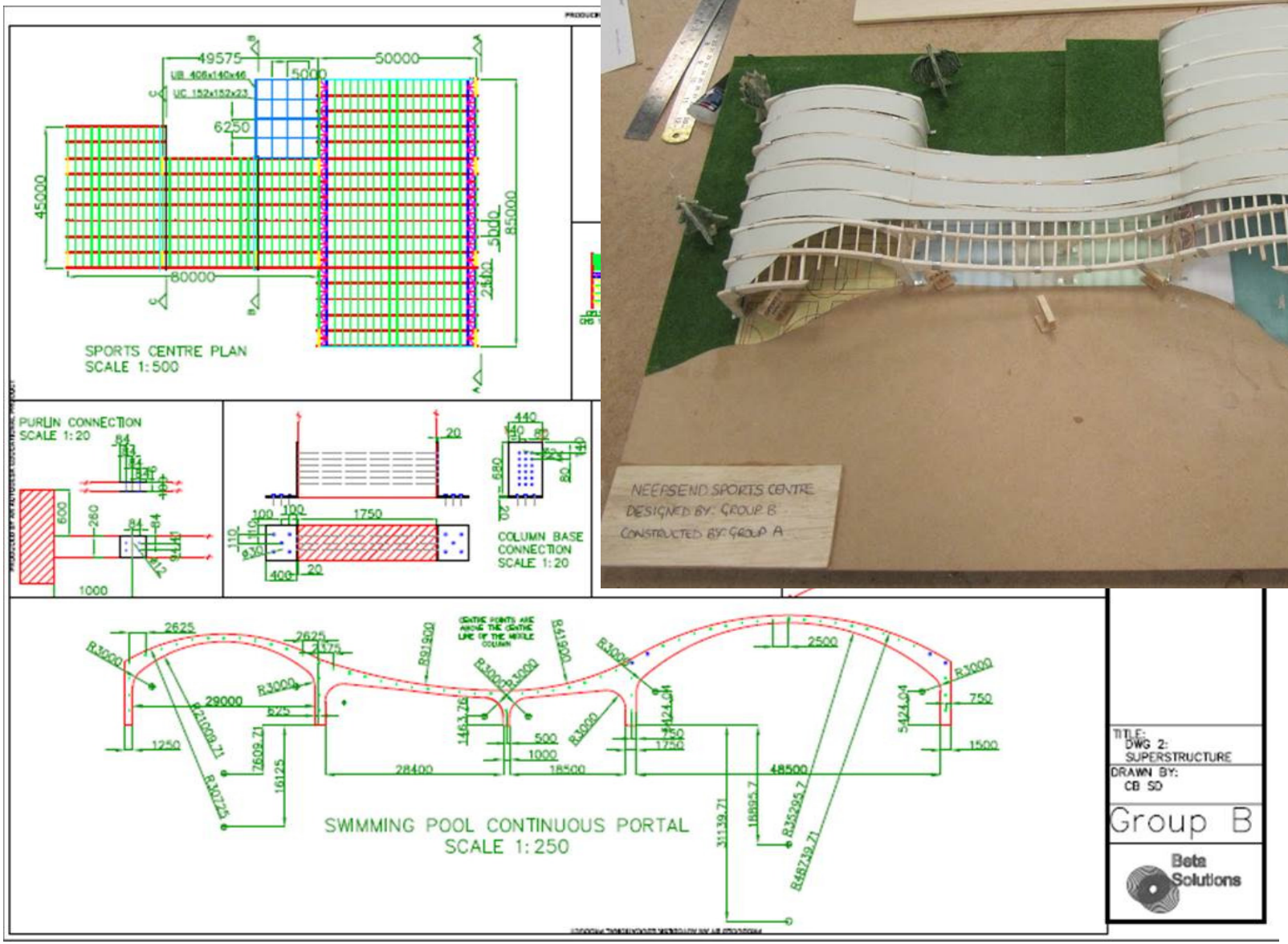
The dwgs & models…



The dwgs & models…



Model Making: Assessment

Groups are required to evaluate another group's model in terms of its interpretation / accuracy compared to the design drawings)

- **Peer assessment – Group A report on:**
  - **Clarity, accuracy and timeliness** of information (drawings, RFI responses etc) provided by Group B
  - **Buildability** of Group B's design (material quantities, temporary support, difficult / varied shapes / sections / complexity of connections)
  - **Quality and interpretation** of Group B's construction (i.e. when compared to Group A's drawings) (accuracy of model key dimensions, heights, section sizes, robustness and quality of construction, line / level / verticality etc)

Model Making: Assessment

- **Module leader assessment:**
  - Quality of evaluation in 'review report'

    Evaluation of criteria, with written and photographic evidence, comparison of dimensions and accuracy, no. of RFIs & time taken to reply

Looking for ability to identify key issues, evaluate, provide constructive criticism – judge others' work effectively

Conclusions

- Working from someone else's drawings highlights poor communication
- Also builds in concepts of quality / accuracy, buildability, timeliness of information supply
- Peer assessment and live peer-engagement encourages active critical evaluation

- Fun!

- Contact Rachel Horn R.Horn@sheffield.ac.uk for more information