# City University London

School of Engineering and Mathematical Sciences

Engineering Drawing and Design, EM 1105

Exercise code:	Introductory
Exercise type:	Group
Exercise title:	Lattice tower Tutorial

### **Exercise Assignment:**

This is a design, build and test appreciation exercise. It will not be marked!

The objective of this exercise is to design and construct a slender tower of a specified height within a given base area. The tower must be capable of withstanding a given minimum load. The load will then be increased gradually until failure occurs.

This is a group design project. Groups will be formed out of 4 students. Two laboratory sessions are allocated, but you may work on the project at any reasonable time by arrangement with Mr Hooker or Mr Rose. Testing will take place during the 2<sup>nd</sup> week exercise on Thursday for groups A and B and on Friday for groups C, D and E.

#### **IMPORTANT:**

Reports (one per group) must be submitted directly to your tutor on the day of testing. Report should contain names of the group members, short description of the produced design, results of testing and a review on positive and negative features of a designed tower. Describe briefly which knowledge would be beneficial for a more successful design.

The tower must satisfy following specification

## **Specification:**

- Height of tower	530 mm
- Maximum base area	900 mm2 i.e. the base corners must lie within a 30 mm square.
- Allowance for chain	hole for placement of a test chain through the tower
- Maximum no of guying points	4 at one level only
- Test load	150 N (15 kg)
- Available material:	
3 mm x 3 mmx 600 mm	7 lengths
3 mm x 50 mm x 200 mm	1 length
balsa cement, cotton threa	d

## Hints:

- 1. Always read exercise assignment carefully.
- 2. Use all the available material in sensible fashion.
- 3. Take care to build the structure as nearly perpendicular to the base as possible.
- 4. Accuracy in construction is of critical importance.
- 5. Think carefully about the provision of a platform for the loading plate.
- 6. Look at structures of this type (pylons, radio antennae, radio masts, high cranes) and see how they are guyed and designed.
- 7. Plan before you build. Try to sketch the tower you are going to build. No additional material will be issued.