Carleton University
CIVE/ARCC 4202
Assignment #1

Assignment due on Wednesday, January 27, 2016

To be submitted at the tutorial class

1) Uncle Bob built a raft using six freshly cut Black spruce logs, 2.5 metres long and 30 centimetres in diameter. To his dismay, he sank as soon as he stepped on it. If Bob weighs 70 kilos, what should the maximum MC of the wood be if the raft is to float with Bob on it?

2) In order to circumvent the tariffs during the softwood dispute, which did not apply to value-added wood products, a company sold precut softwood (Douglas-fir and spruce) truss components to the US truss market. The pieces are 2 x 4 nominal, kiln dried to 19% MC, with lengths varying between .5 metres and 6 metres in length. Upon hearing this, a US trade lobby group decided to mount a challenge on the basis that pieces 6 metres in length could experience longitudinal shrinkage up to 12 mm when drying to 16% MC. This would require the pieces to be re-sawn, hence removing the value-added component and making the wood prone to trade duties. Longitudinal tolerances for truss components are set at 4 mm.

How would you argue against the challenge?

3) What is juvenile wood and how does it affect wood products?

4) Log home builders need to anticipate shrinkage when they are building their structures. Excess shrinkage can cause staircases to buckle, windows to break in their frames and door to jam open or shut. Calculate the expected shrinkage between the floor and the top of the wall for the following single storey log home wall considering

- the logs are 10 inches in thickness
- their initial moisture content is 40%
- their final moisture content is 10%

What would the óapproximateô R value of the wall be if we assume this value to be taken at the widest point on the wall?