Tutorial Sheet for Beam Containing Stirrups

Name:



Concrete strength $f_{cu} = 51.0$ N/mm², $f_t = 5.49$ N/mm². Bot. reinf. 2 T12 bars, 2R3 top. Cover 25mm to main bars. Stirrups closed links, 3mm ϕ mild steel, spaced 50mm c/c. Young's Modulus $E_s = 200,000$ N/mm² for steel and $E_c = 30,000$ N/mm² for concrete.



Comment briefly on the behaviour of the beam through the elastic range, during progressive cracking, up to peak load and post-peak behaviour. Comment on whether you think this behaviour was to be expected, and why.

Estimate the cracking load of the specimen from the load-deflection plot. By using a transformed section approach, calculate the predicted cracking load and compare with the actual result. Ignore self-weight. Comment on your result. [Hint: Look at page 91 of your Structures 2 notes]

Comment on the strain in the steel bars through the elastic and cracked ranges, and leading up to failure.	
	3000
	- Strain 1/4 span Microstrain ue
	Strain midspan Microstrain ue
	0 20 40 60 80 Applied Load (kN)
By using relevant clauses from the appropriate code-of-practice, pr	edict the design strength of this beam. Comment on