INFLUENCE OF SPIRAL SIZE, SPACING AND COVER ON CTV COLUMN RESPONSE

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I have run moment curvature analysis for a typical CTV column with axial load of 1750kN, changing the spiral size to R10 at a spacing of 35mm (I think this is the NZS3101:1982 requirement). Two cases were considered: 50mm cover to main bars, as per design, and 30mm cover to main bars. Moment curvature response is compared with the design (R6@250) in the plot below. Another case, with R10 @80mm and 50mm cover was subsequently added, and is included below.

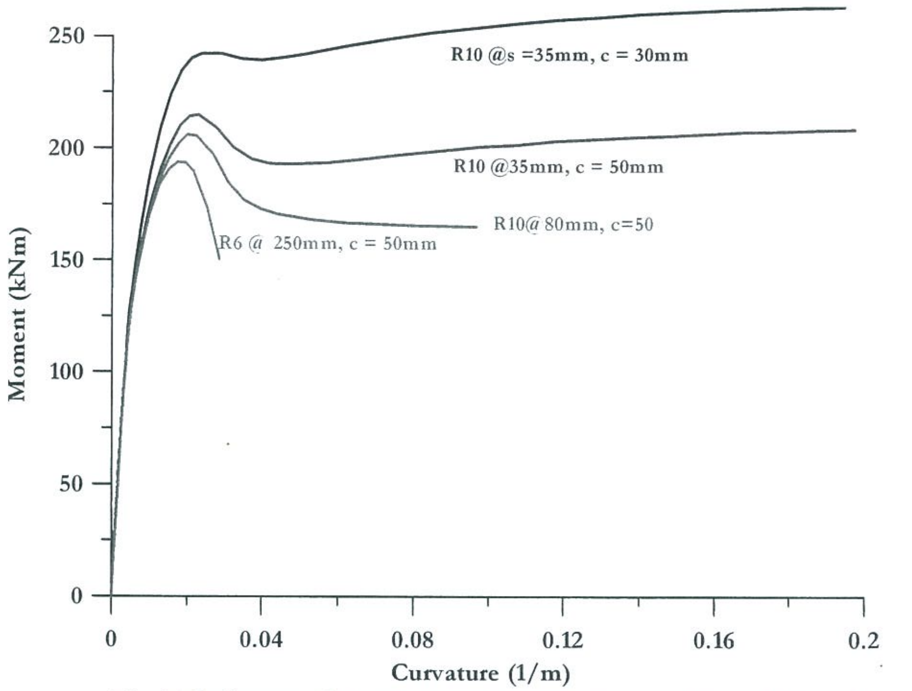

Fig.A3 Influence of Spiral size, pitch and cover on 400mm CTV column

Note that the increased confinement increases the moment capacity as well as the ultimate curvature (particularly for the reduced cover.

These data were then used to predict the fixed-end ultimate drift capacity of the columns. The results are:

Designed column, εc = 0.004 drift = 0.0072 ρ = 0.15%
Designed column, εc = 0.007 drift = 0.0110
R10@35mm, cover = 50mm drift = 0.067 ρ=3% Δ = 217mm
R10@35mm, cover = 30mm drift = 0.065 ρ=2.6%
R10@80mm, cover = 50mm drift = 0.032 ρ=1.3% Δ = 104mm

cf CBGS: ID = 90
CCCC: ID = 110 A
CHHC: ID = 115 A

The drift capacity, at about 6.5% for the increased confinement cases would enable the columns to survive the Feb 22 EQ.

$\rho = \frac{4A_b}{D's}$ D' = 0.3
Ab =