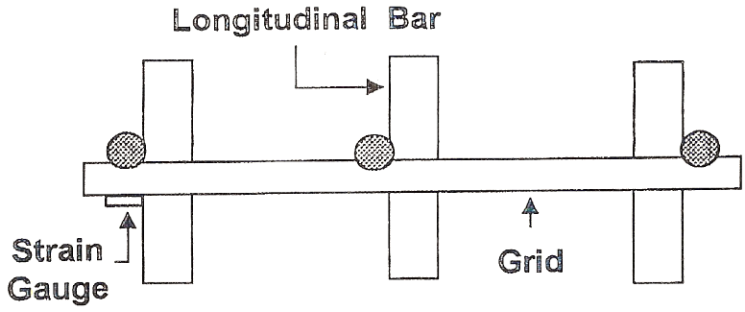
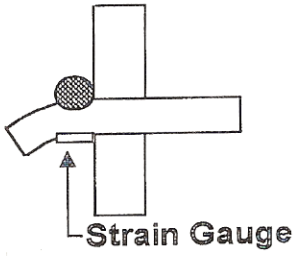


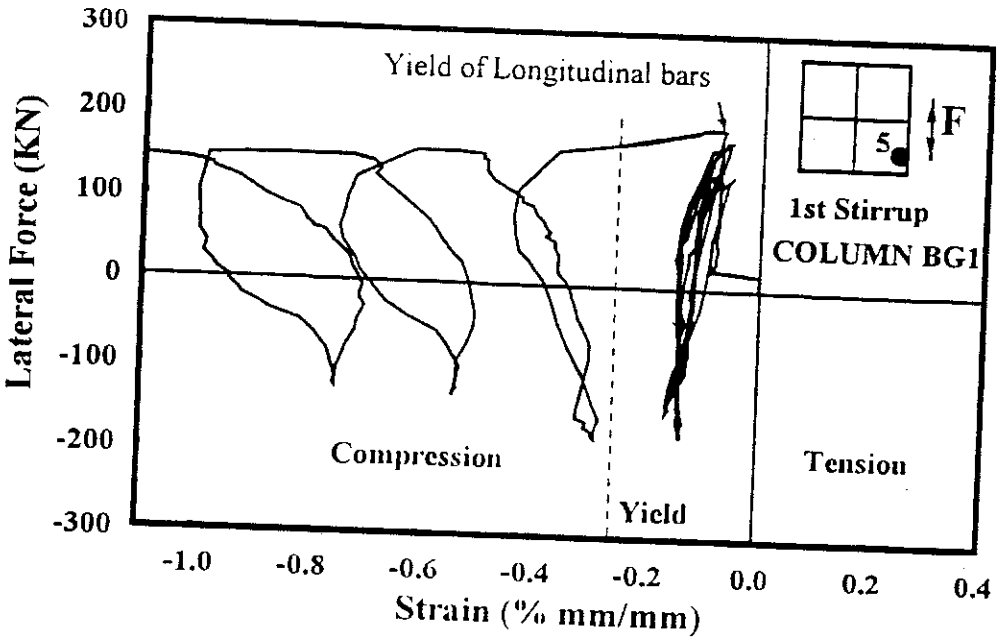
a) Strain Gauge Location (Side View)



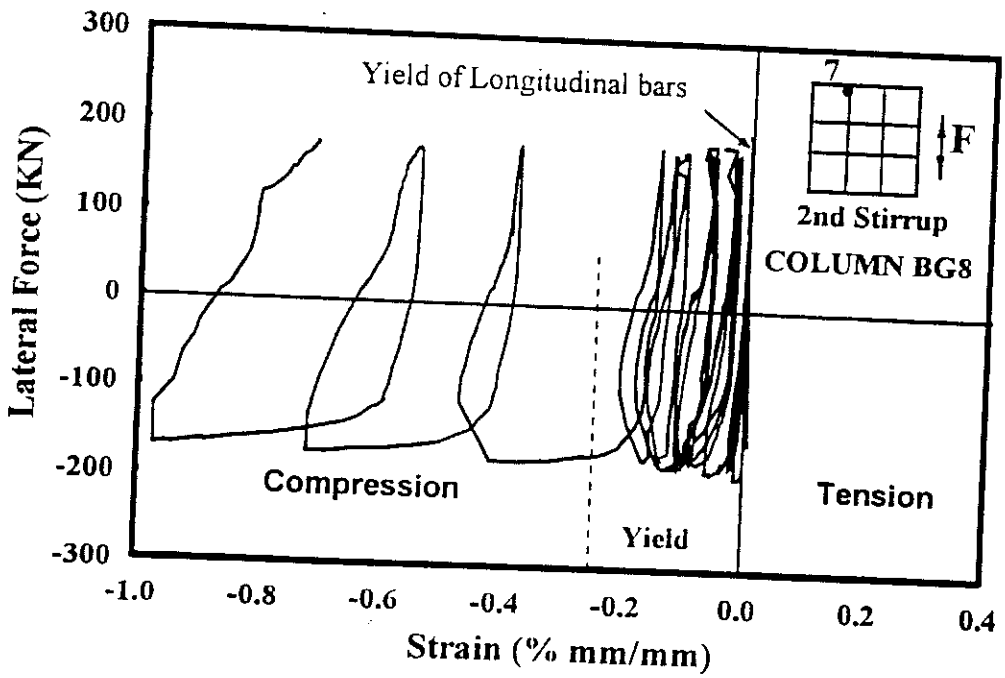
b) Bending of Grid Reinforcement

c) Observed Behavior During Column Tests

Fig. 50 Behavior of Grids at Perimeter Joints



a) Column BG-1 with 4-Cell Grids



b) Column BG-8 with 9-Cell Grids

Fig. 51 Strain Readings at Perimeter Grid Joints

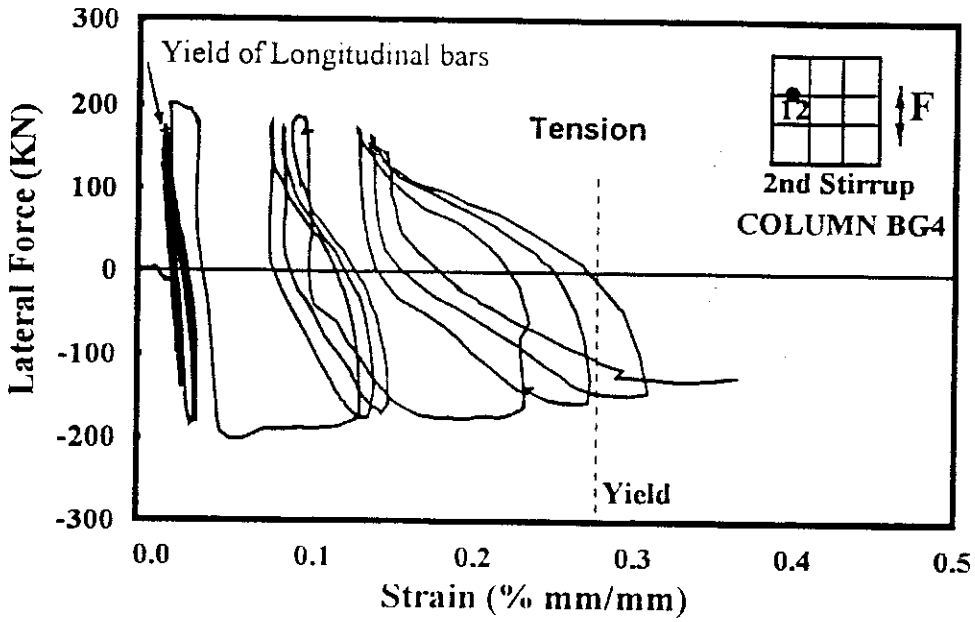


Fig 52 Strain in Grid Reinforcement at Location 12 - Column BG-4

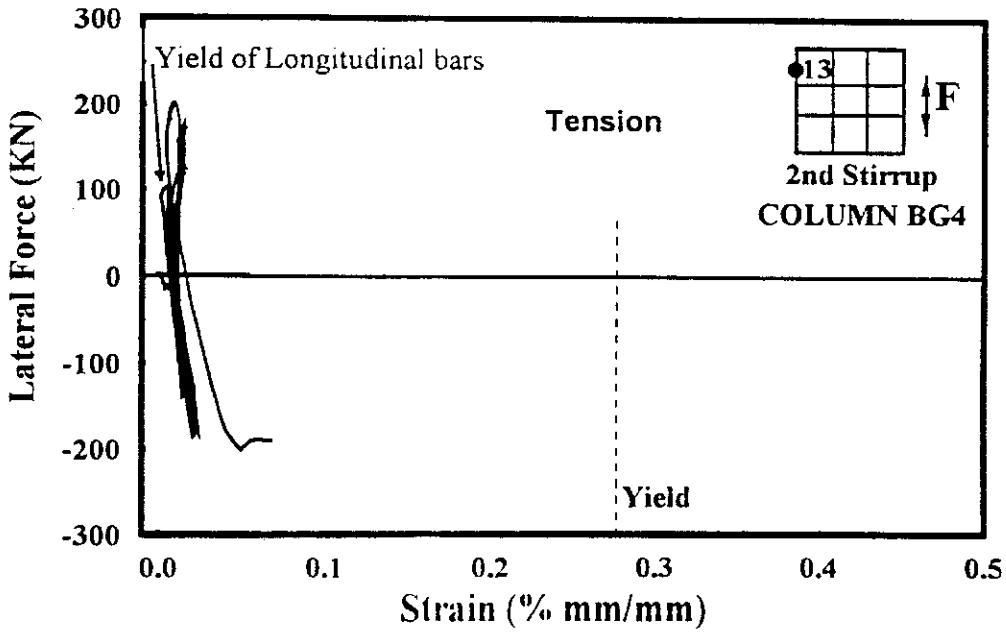


Fig 53 Strain in Grid Reinforcement at Location 13 - Column BG-4

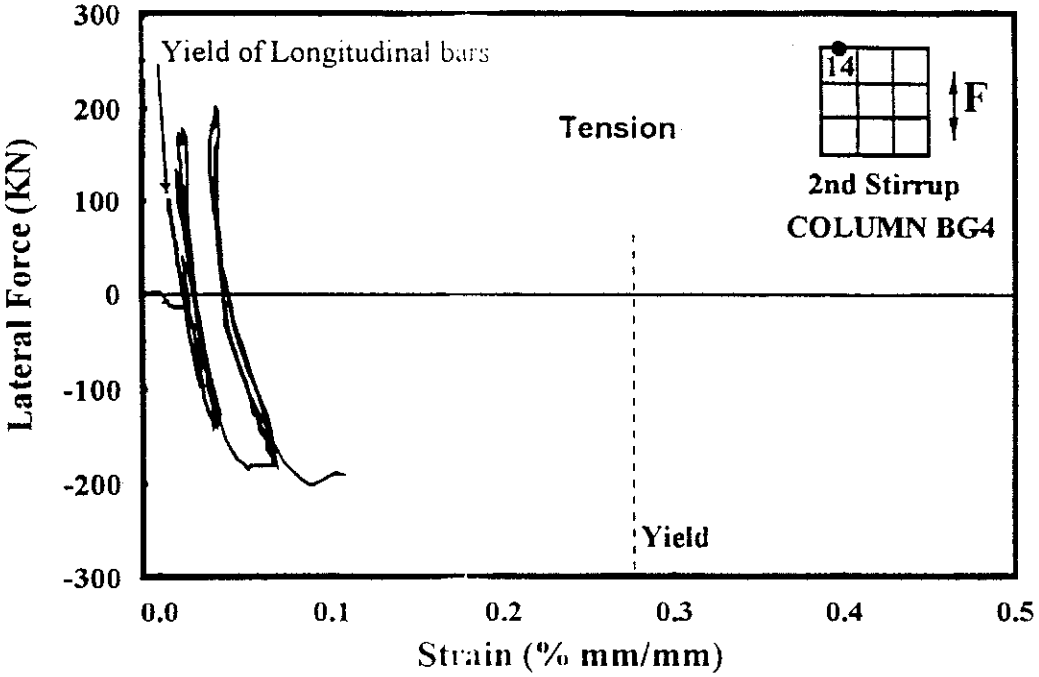


Fig 54 Strain in Grid Reinforcement at Location 14 - Column BG-4

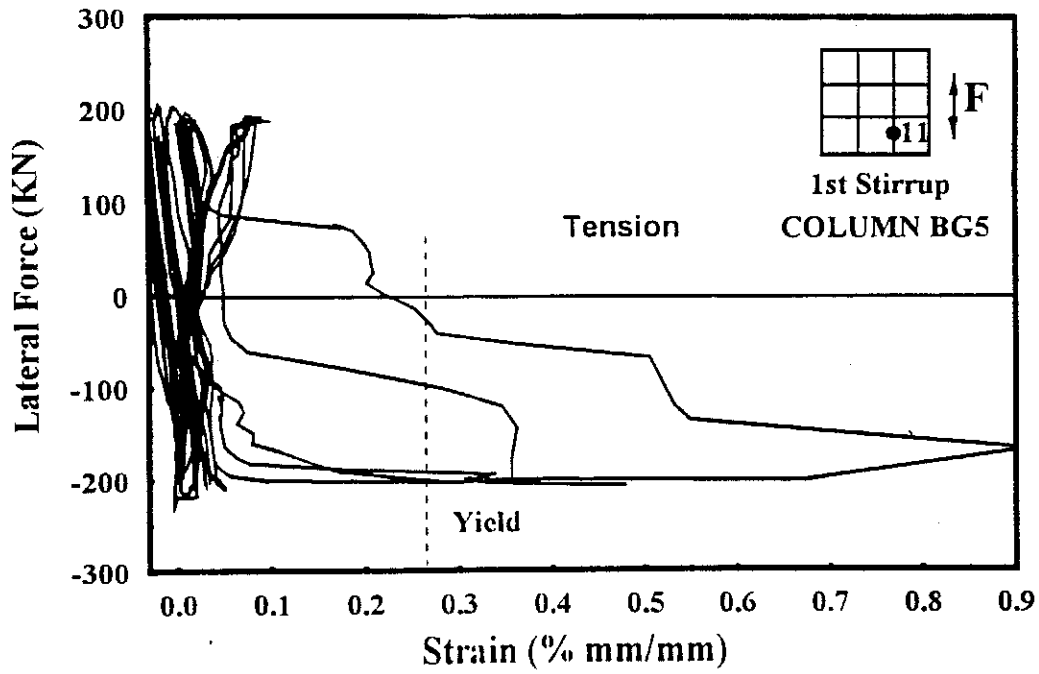


Fig 55 Strain in Grid Reinforcement at Location 11 - Column BG-5

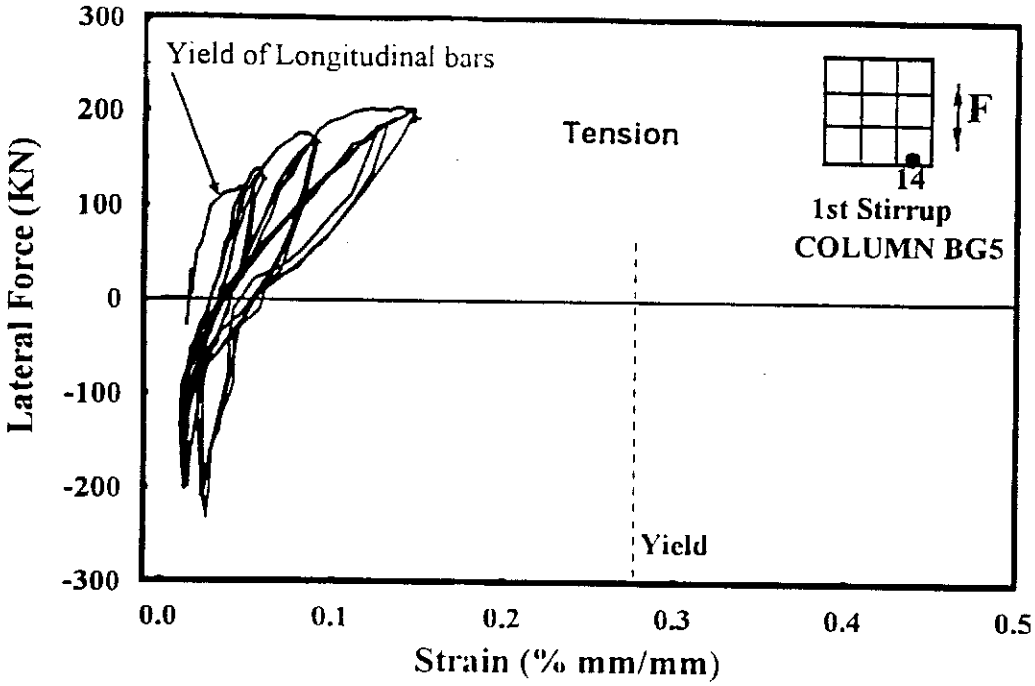


Fig 56 Strain in Grid Reinforcement at Location 14 - Column BG-5

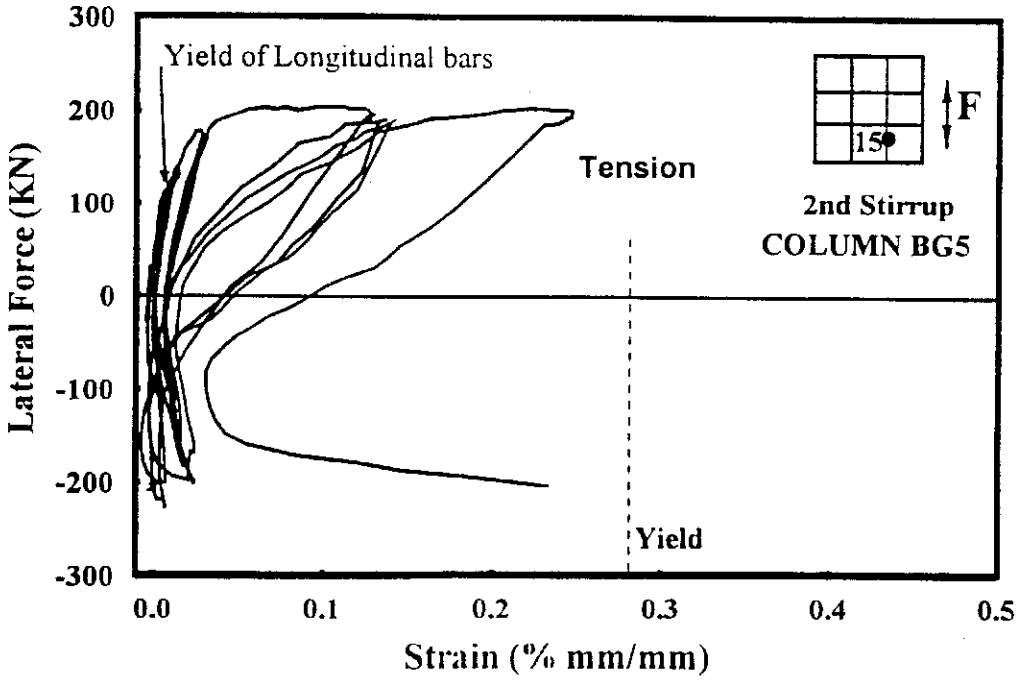


Fig 57 Strain in Grid Reinforcement at Location 15 - Column BG-5

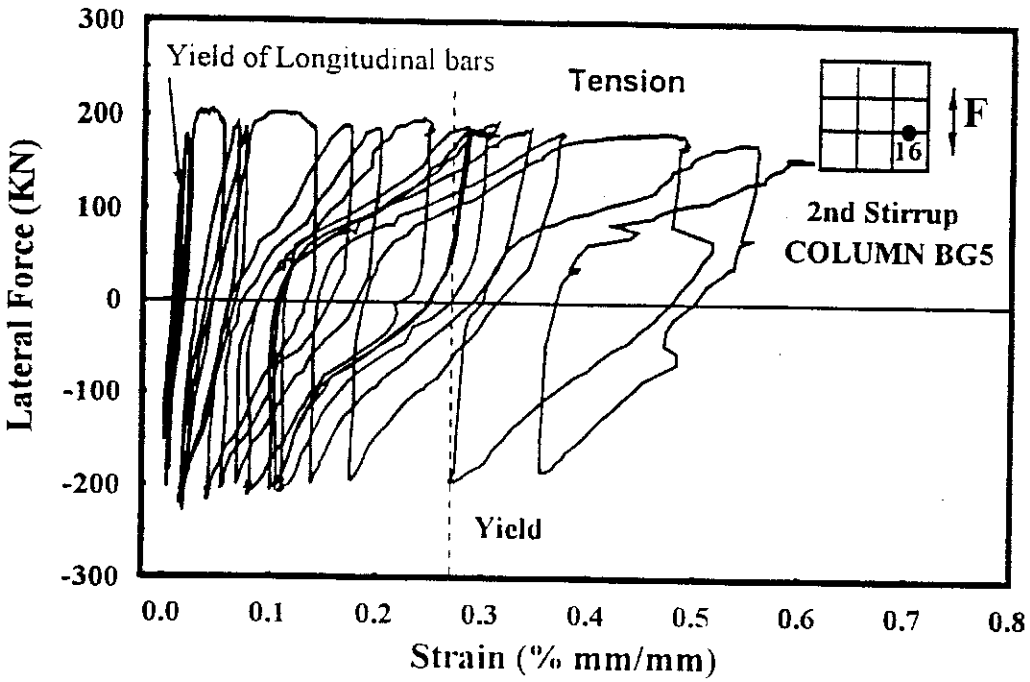


Fig 58 Strain in Grid Reinforcement at Location 16 - Column BG-5

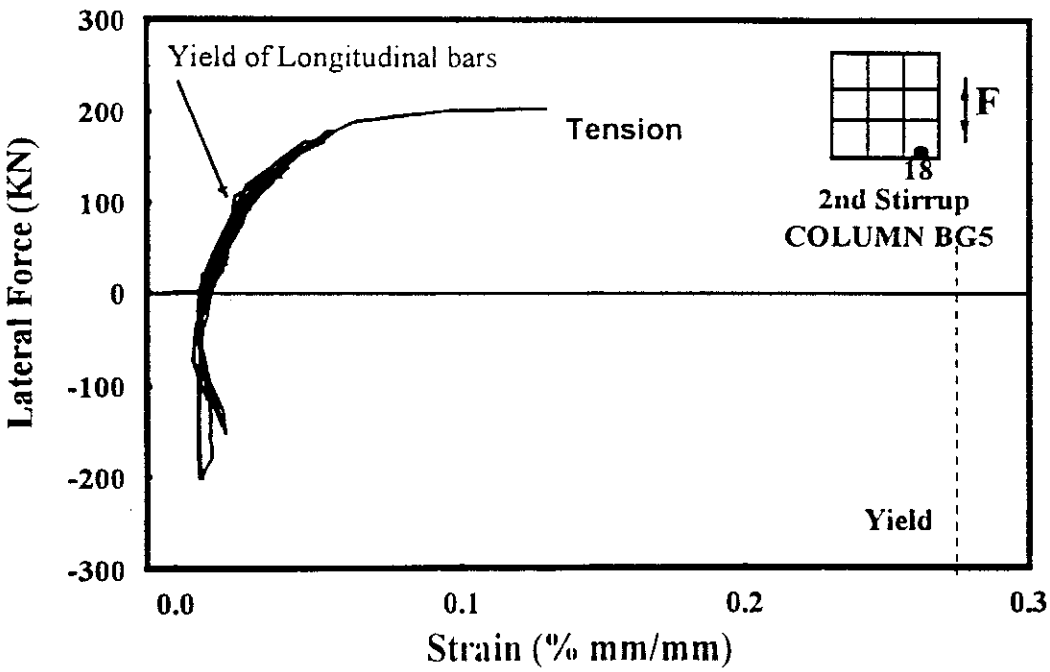


Fig 59 Strain in Grid Reinforcement at Location 18 - Column BG-5

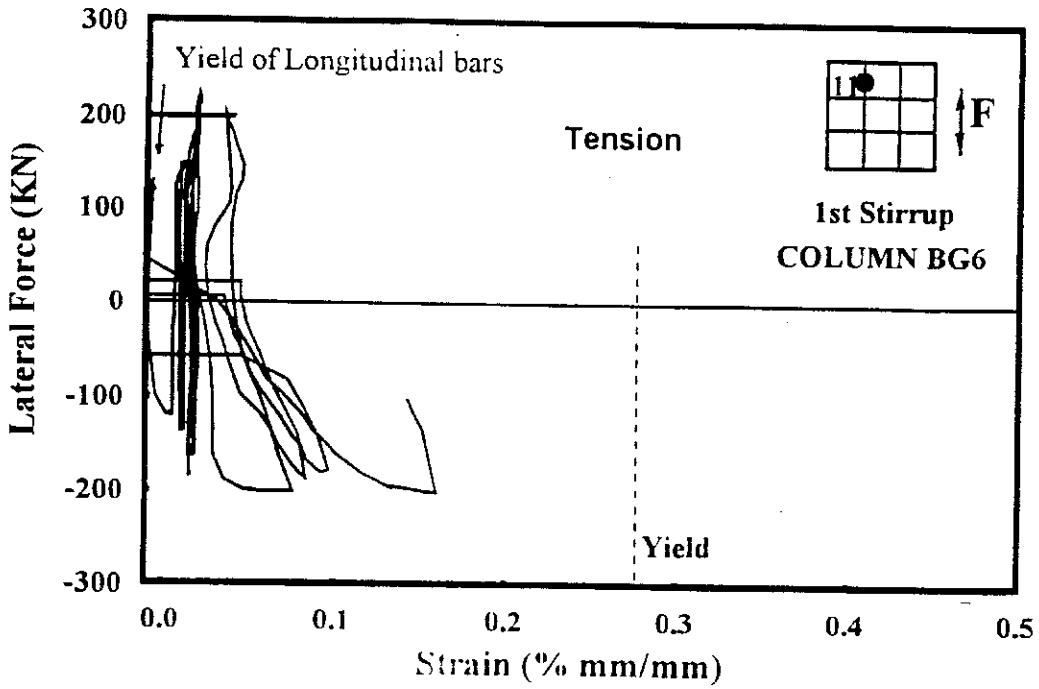


Fig 60 Strain in Grid Reinforcement at Location 11 - Column BG-6

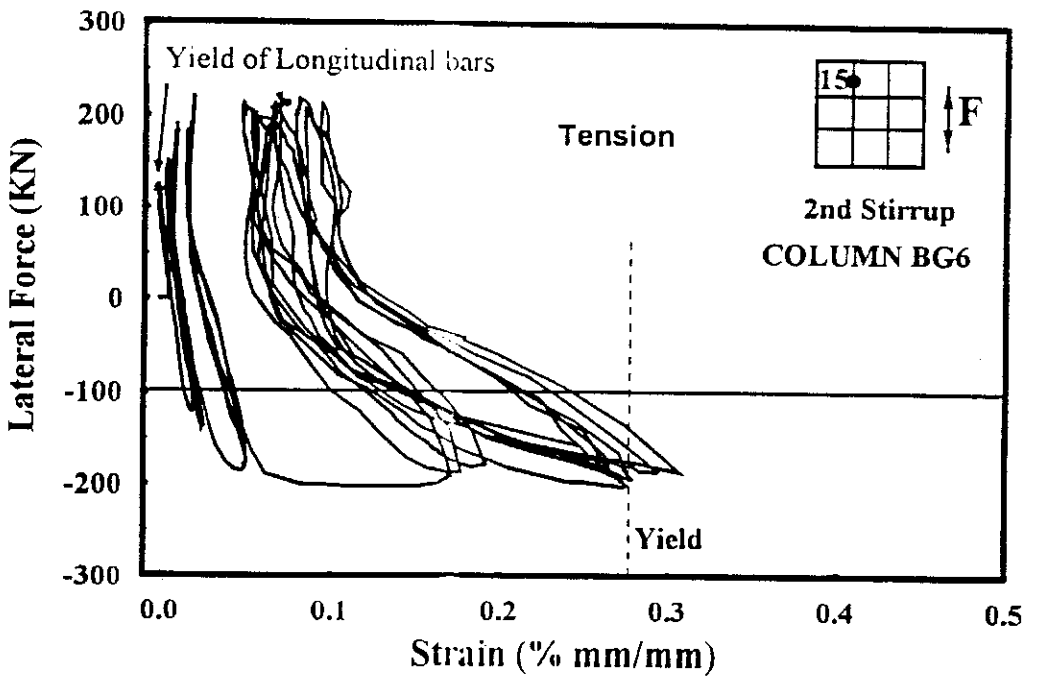


Fig 61 Strain in Grid Reinforcement at Location 15 - Column BG-6

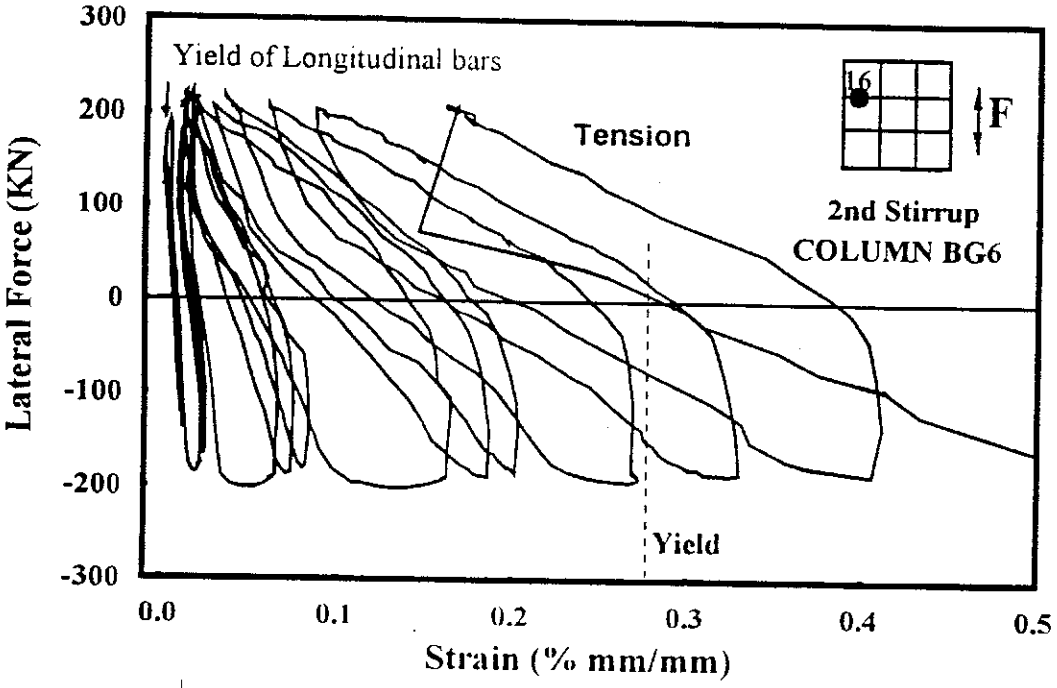


Fig 62 Strain in Grid Reinforcement at Location 16 - Column BG-6

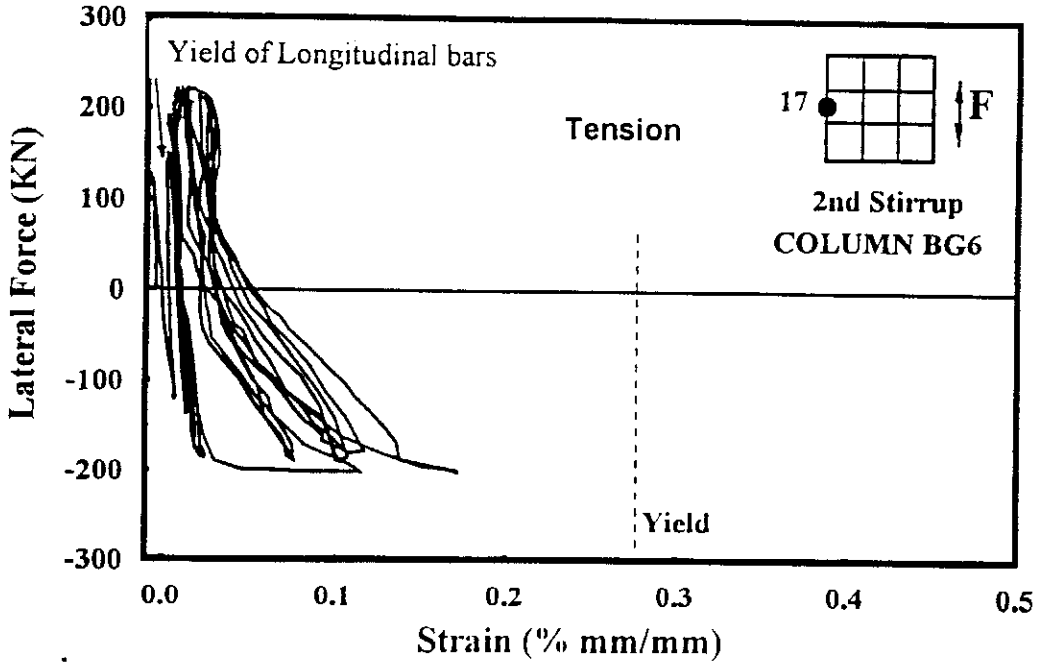


Fig 63 Strain in Grid Reinforcement at Location 17 - Column BG-6

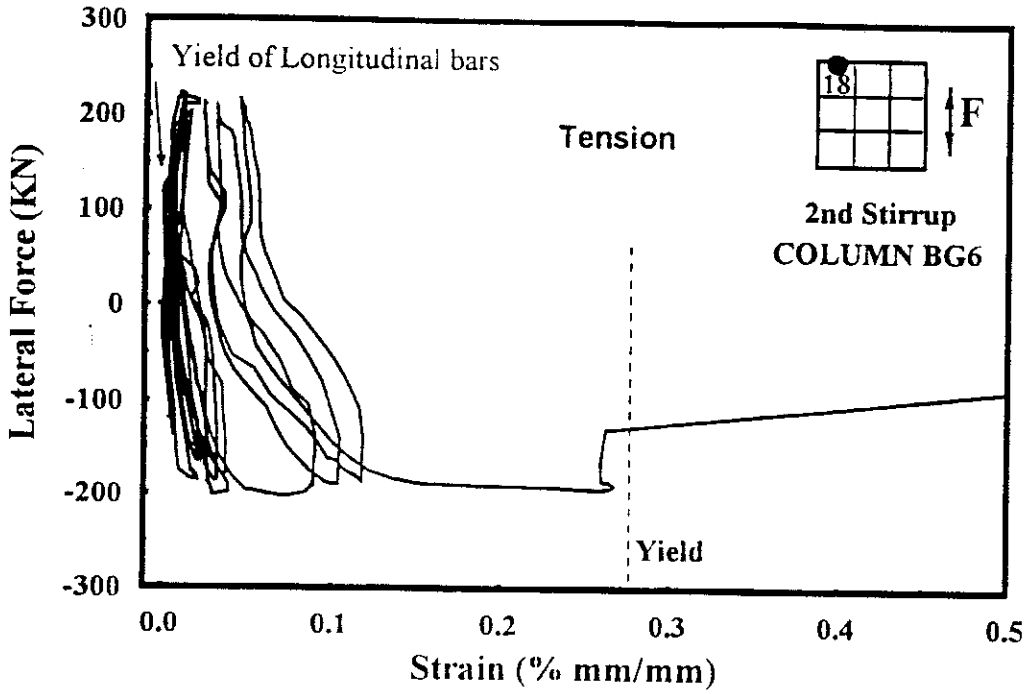


Fig 64 Strain in Grid Reinforcement at Location 18 - Column BG-6

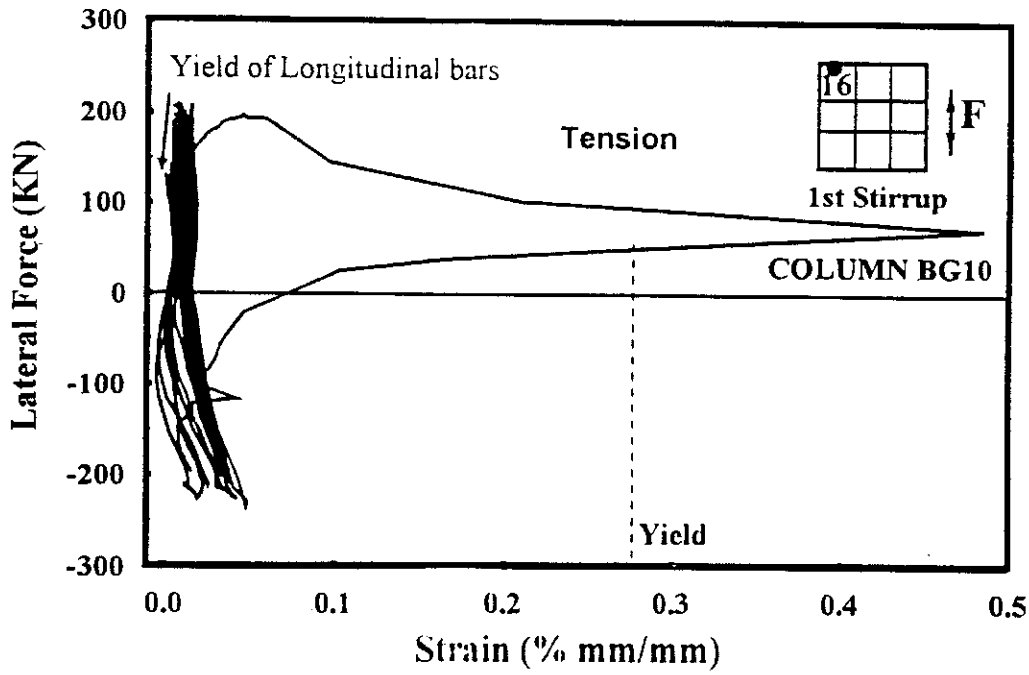


Fig 65 Strain in Grid Reinforcement at Location 16 - Column BG-10

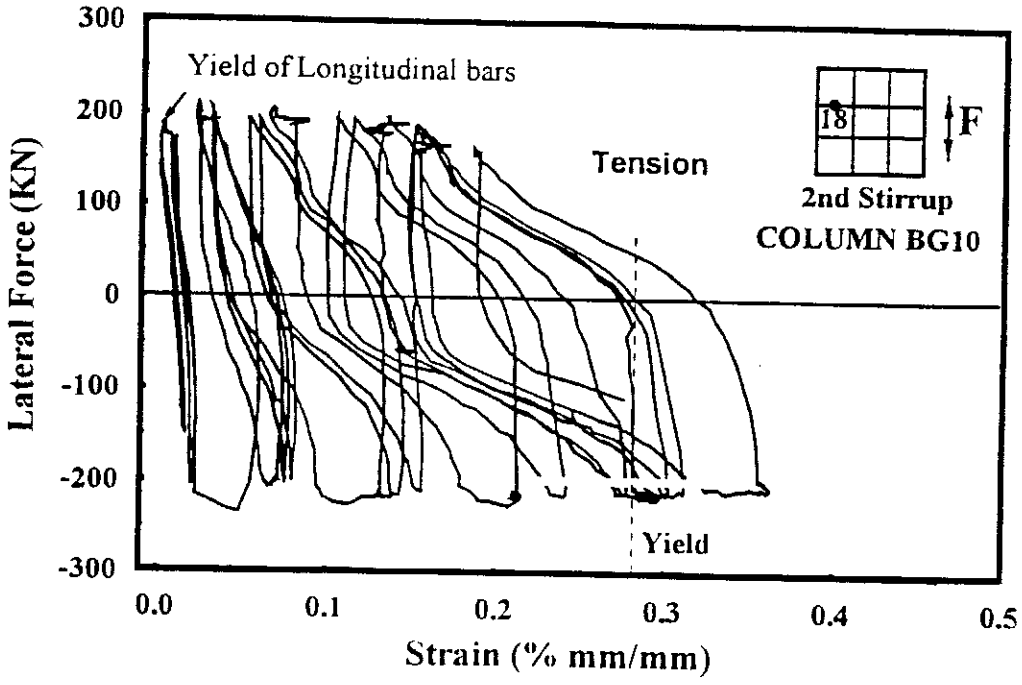


Fig 66 Strain in Grid Reinforcement at Location 18 - Column BG-10

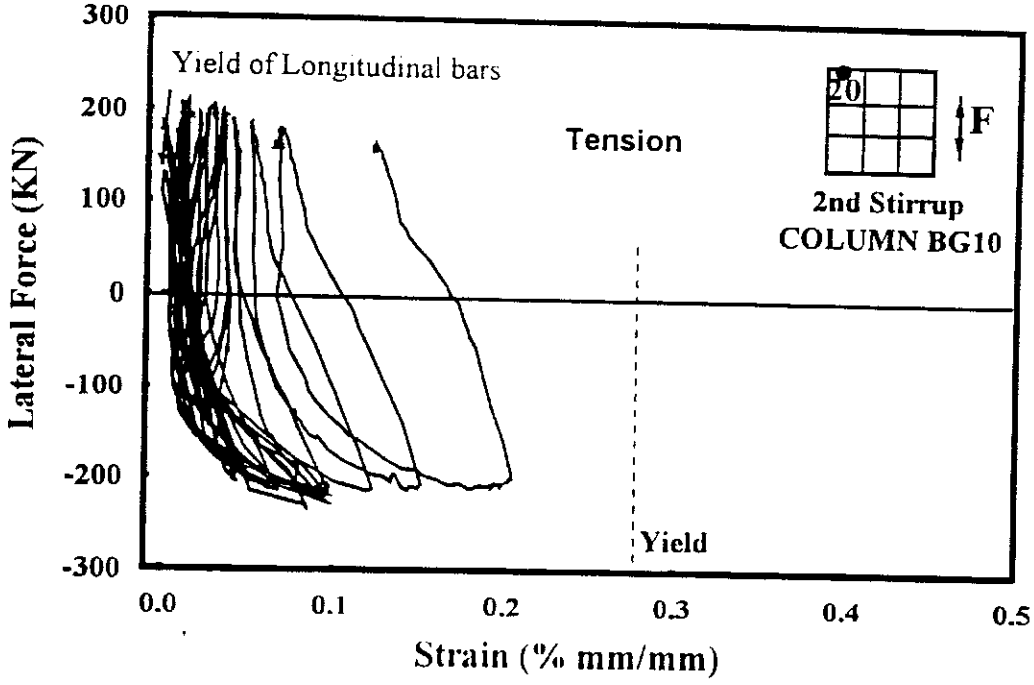


Fig 67 Strain in Grid Reinforcement at Location 20 - Column BG-10

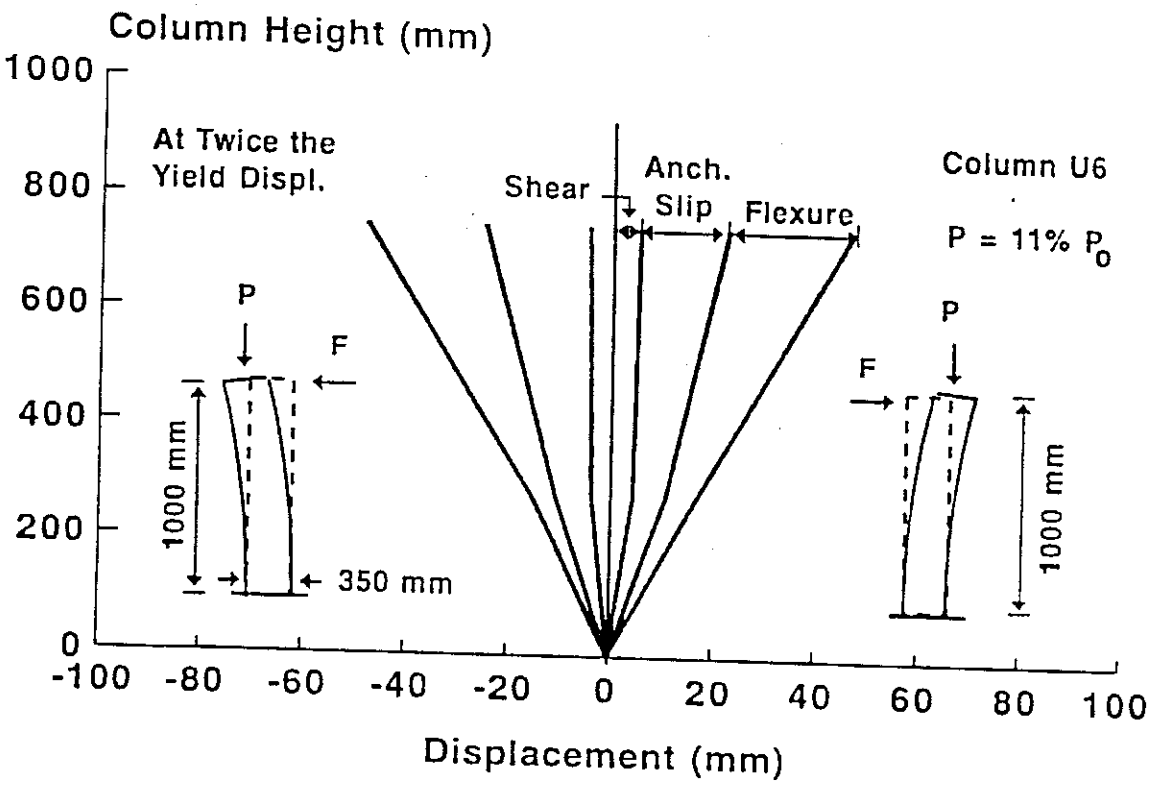


Fig.68 Displacement Components Recorded During a Column Test (8)

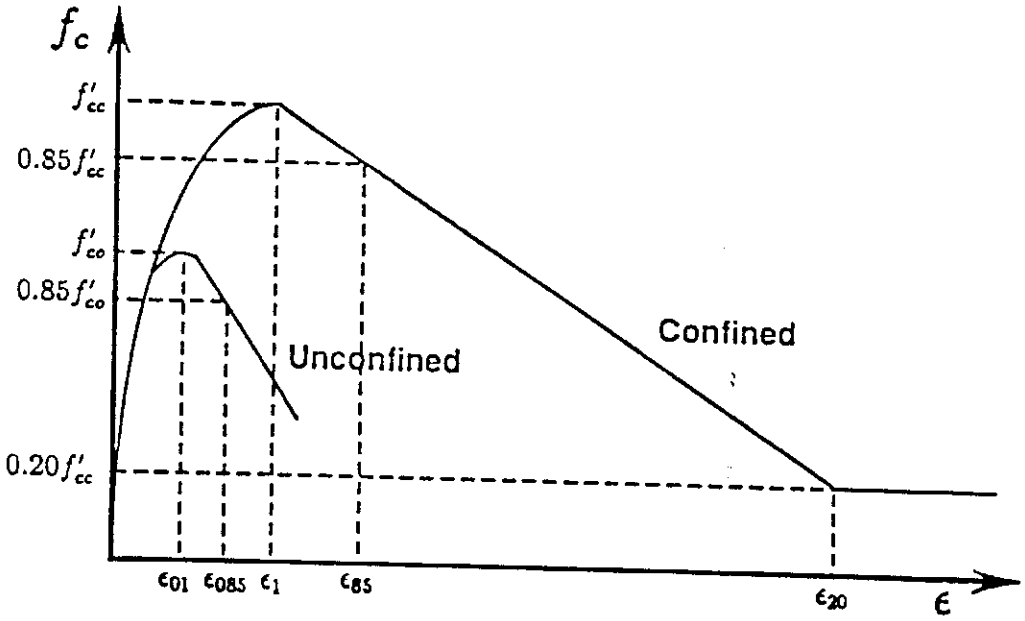


Fig. 69 Stress-Strain Relationship for Confined Concrete (9)

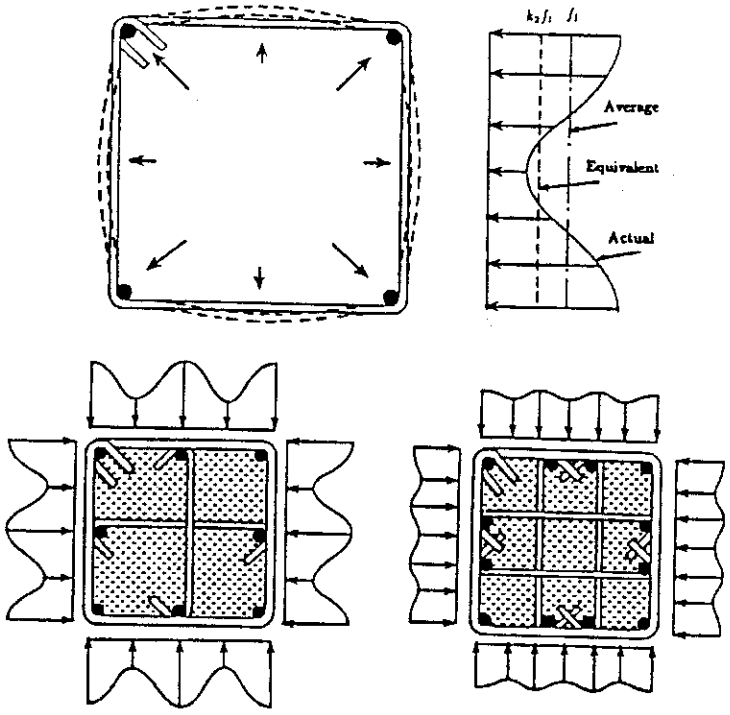


Fig. 70 Distribution of Lateral Confinement Pressure in Square Columns (9)

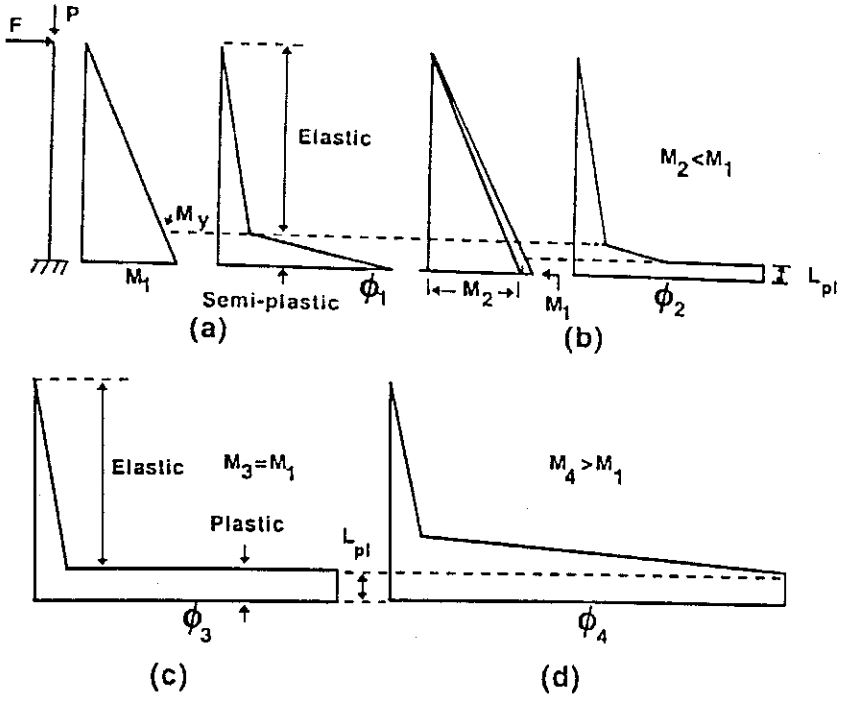
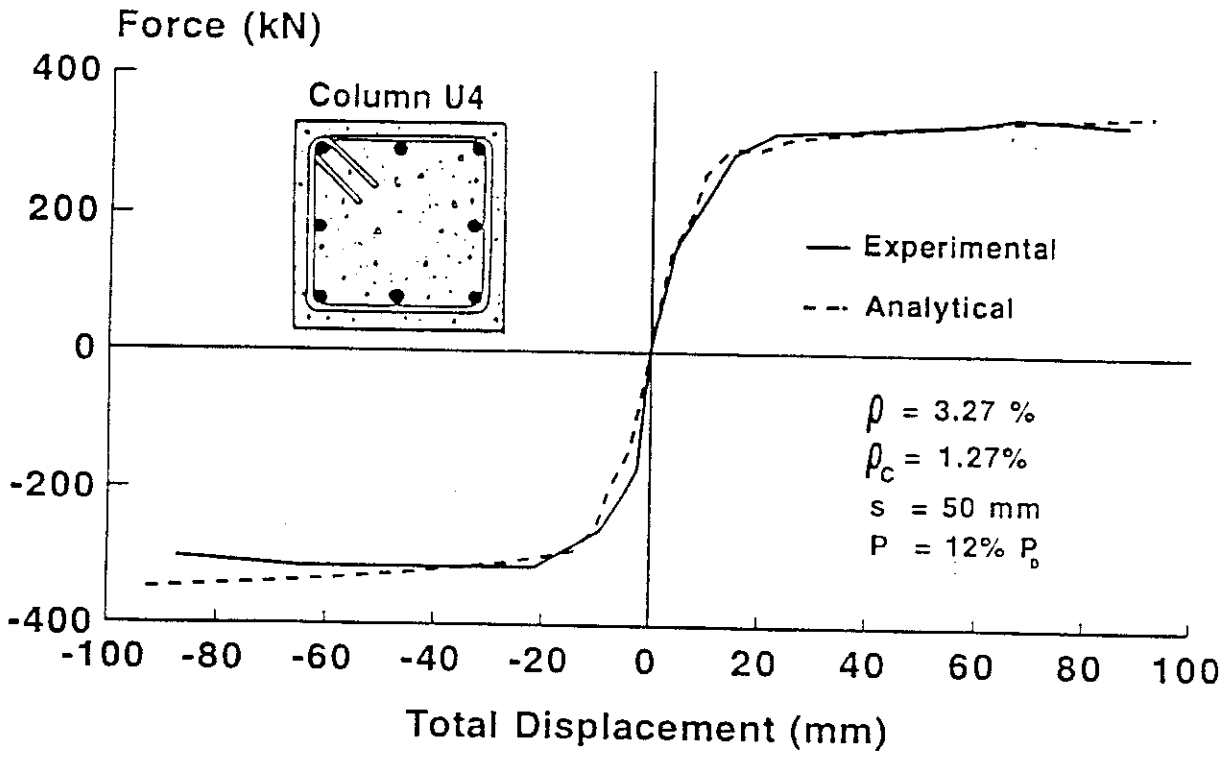


Fig. 71 Progression of Plastic Hinge and Distribution of Curvatures in Columns (11)



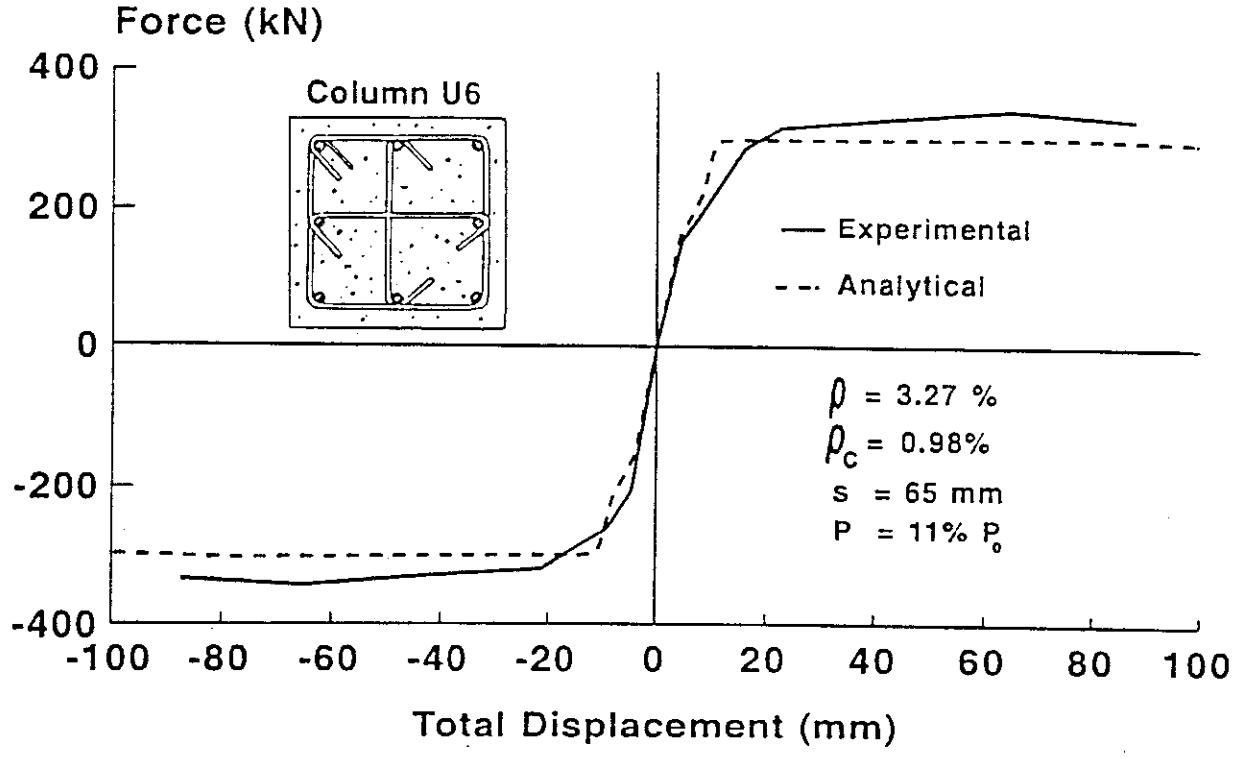
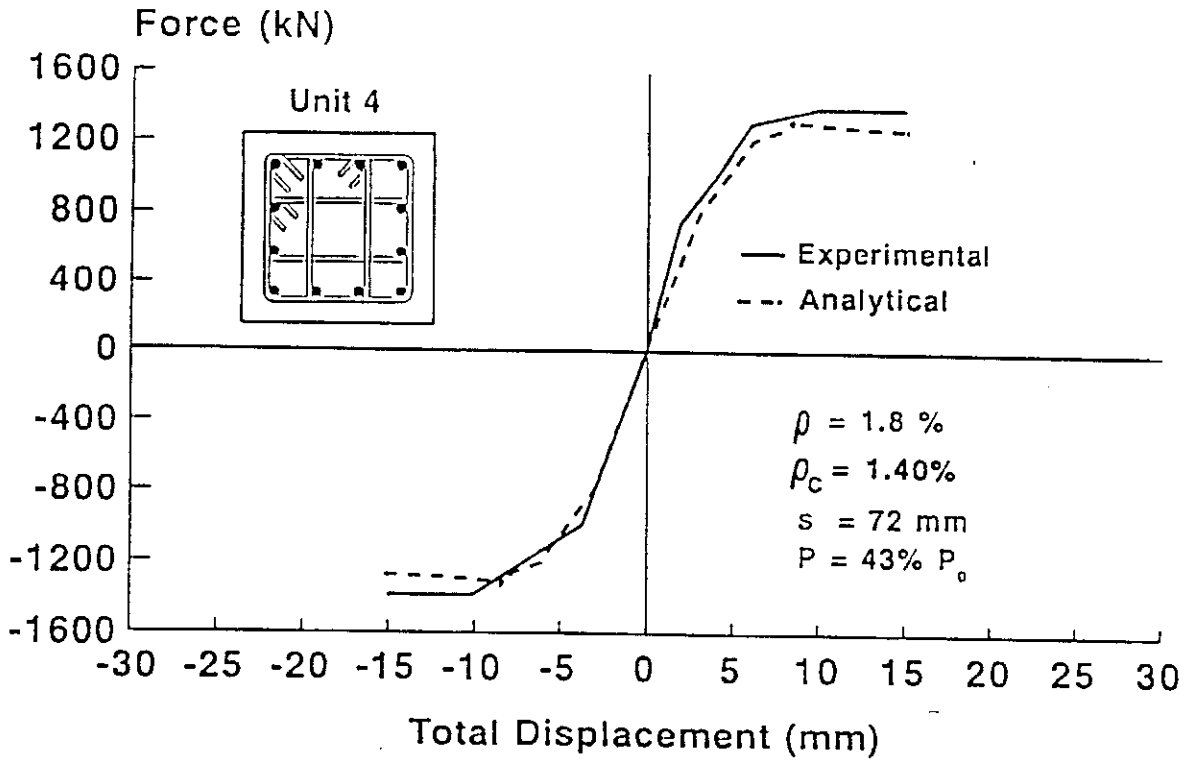
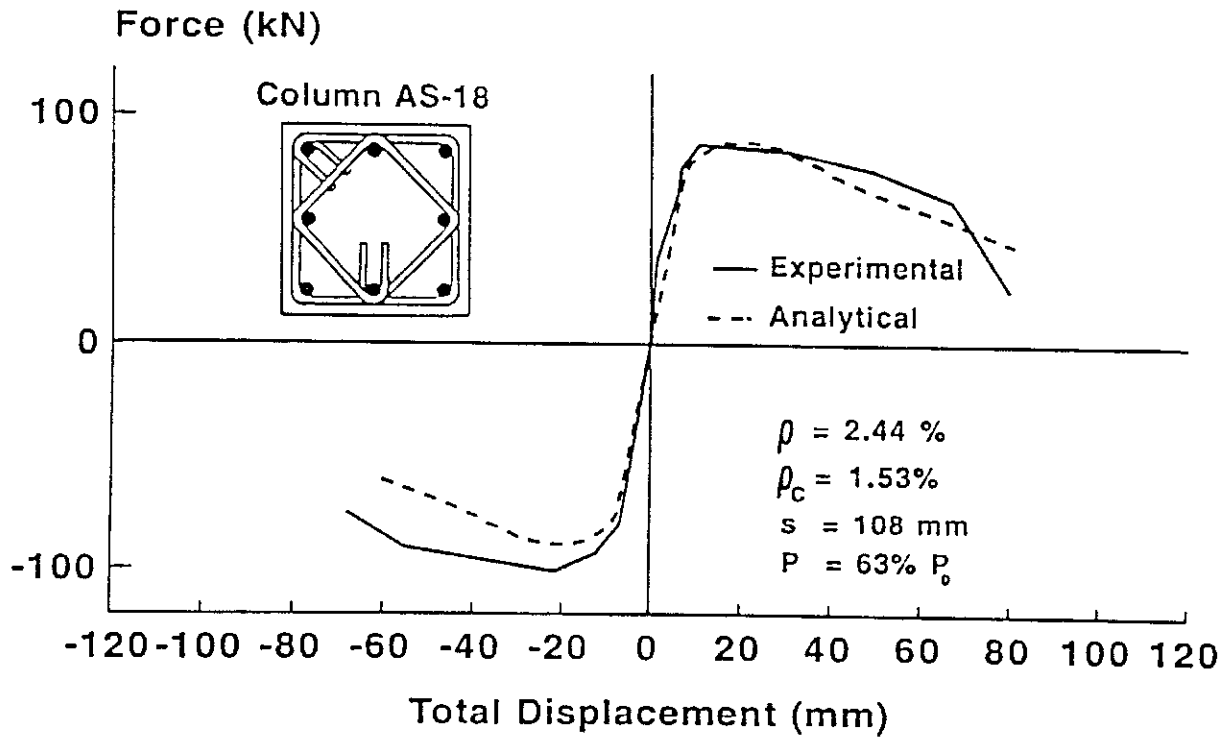


Fig. 72 Comparisons of Force-Displacement Relationships for Columns with Conventional Ties Tested by Saatcioglu and Ozcebe (8)



(a) Column Test by Park et al. (12)



(b) Column Test by Sheikh and Khoury (13)

Fig. 73 Comparisons of Force-Displacement Relationships for Columns with Conventional Ties

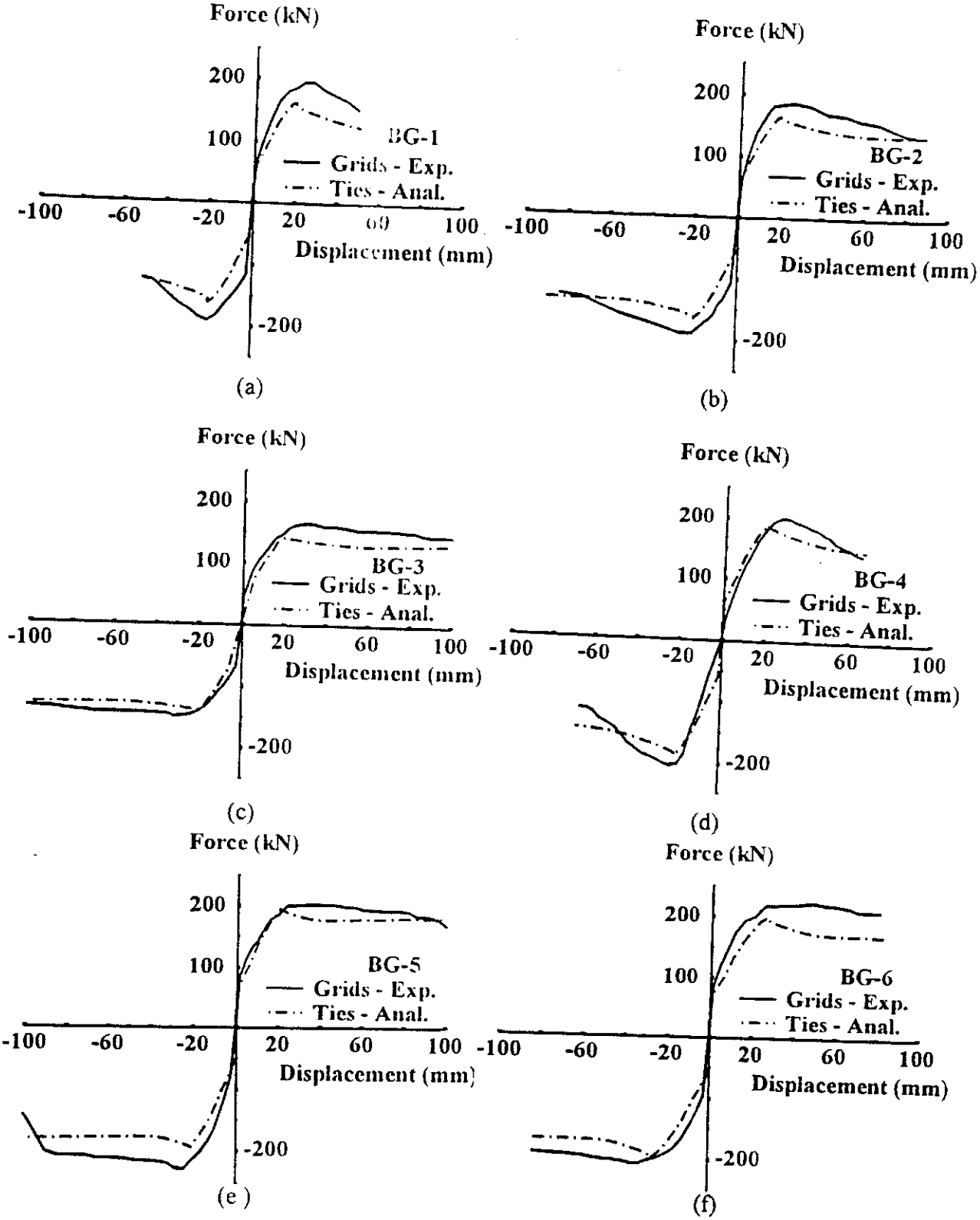


Fig. 74 Comparisons of Force-Displacement Relationships

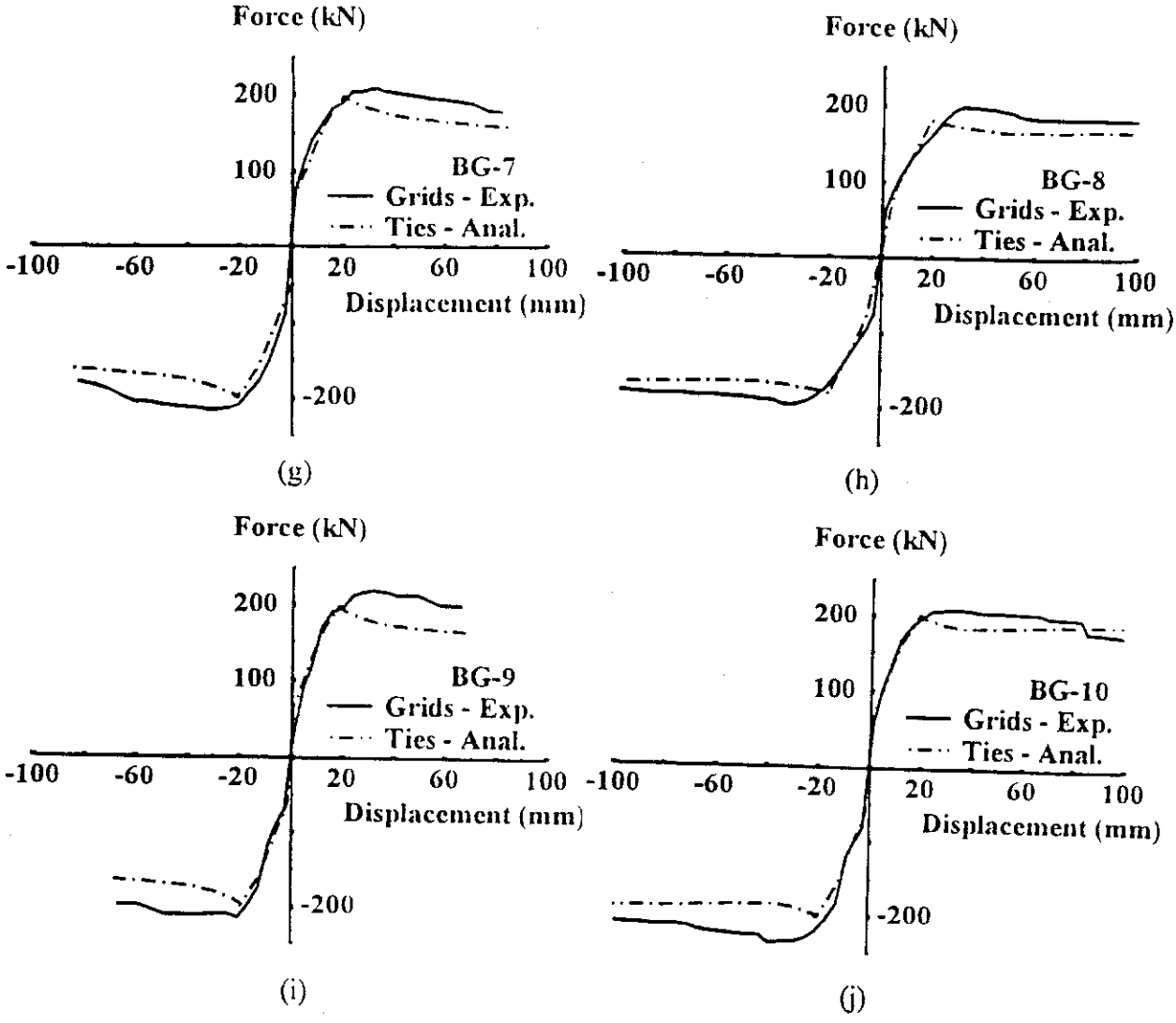
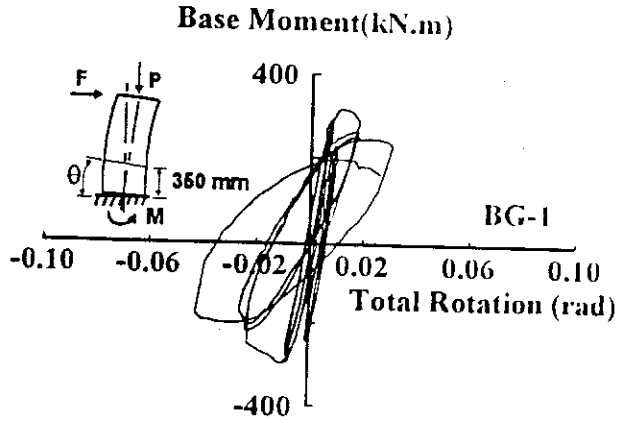
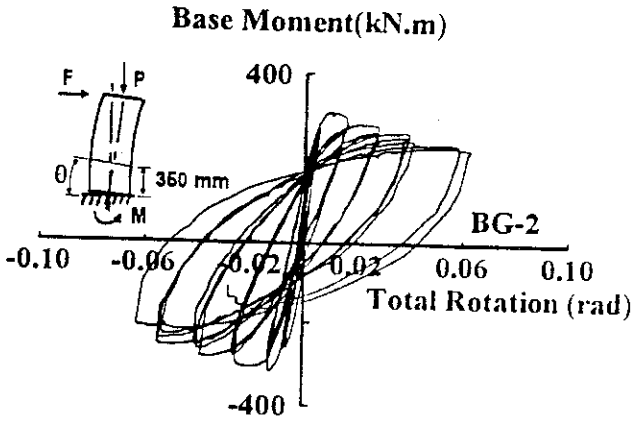


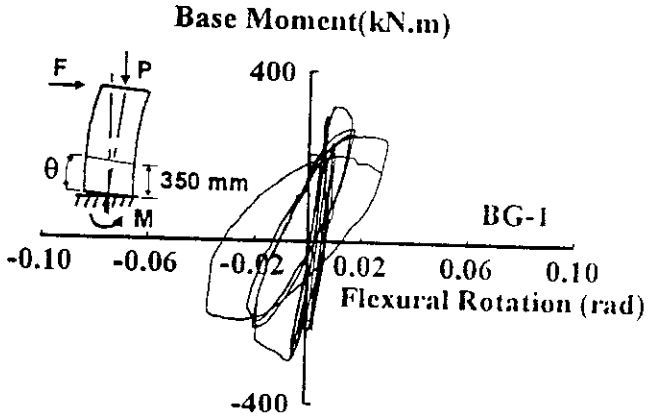
Fig. 74 Comparisons of Force-Displacement Relationships (Cont'd)

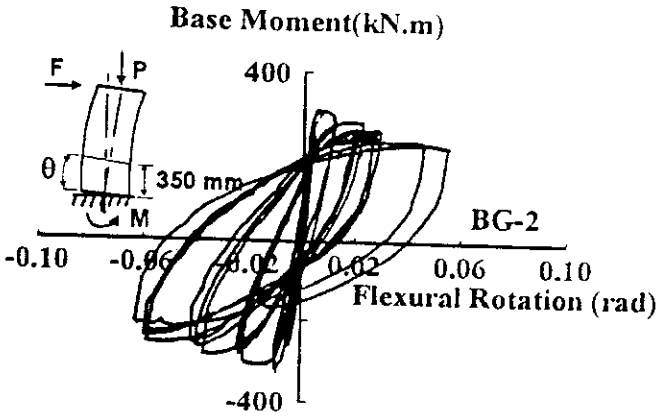
APPENDIX - A -

Moment-Rotation Data Recorded During Column Tests









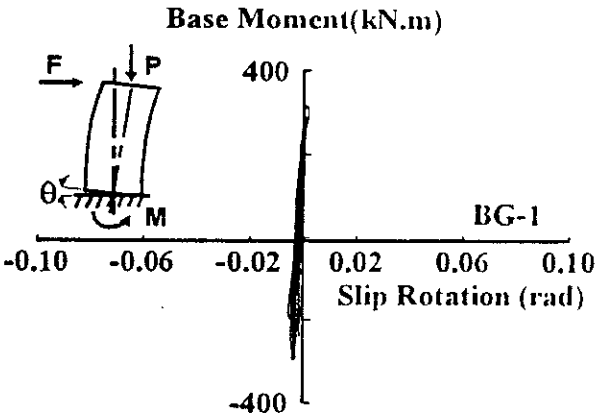


Fig. A1 Moment-Rotation Relationships for BG-1

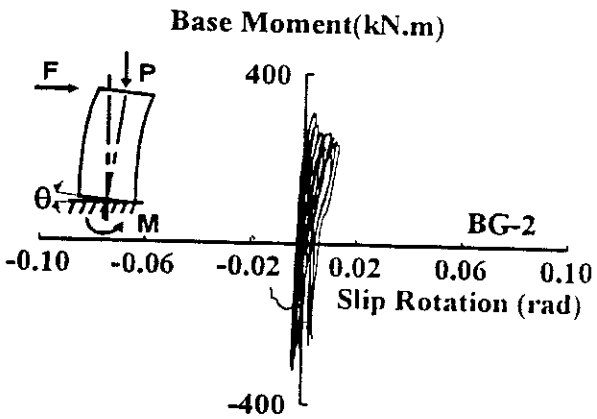
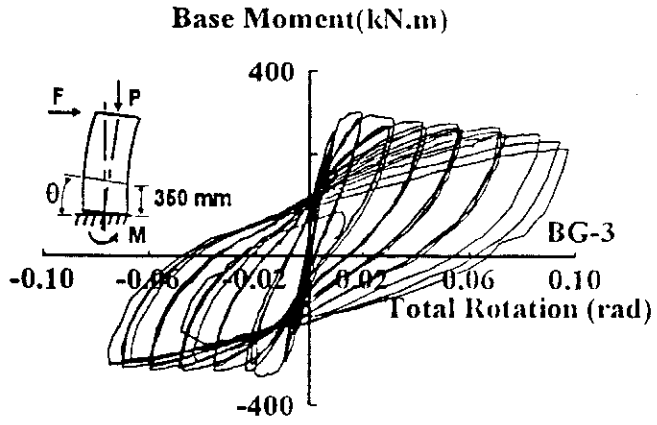
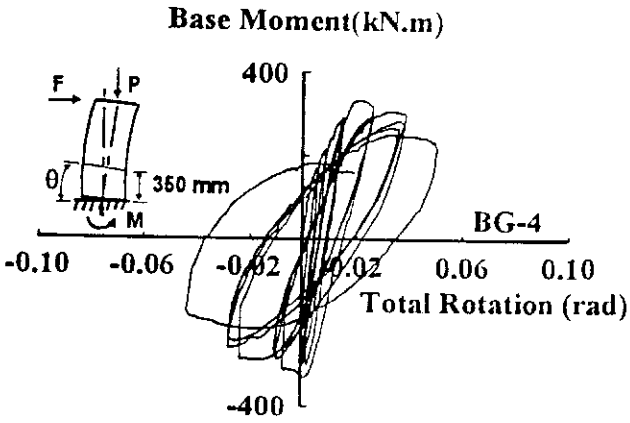
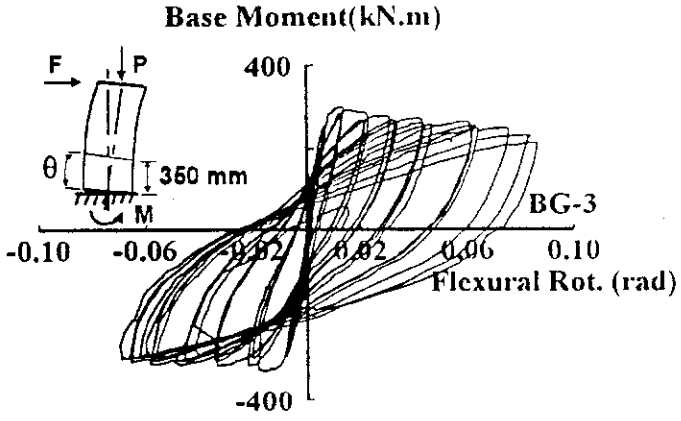
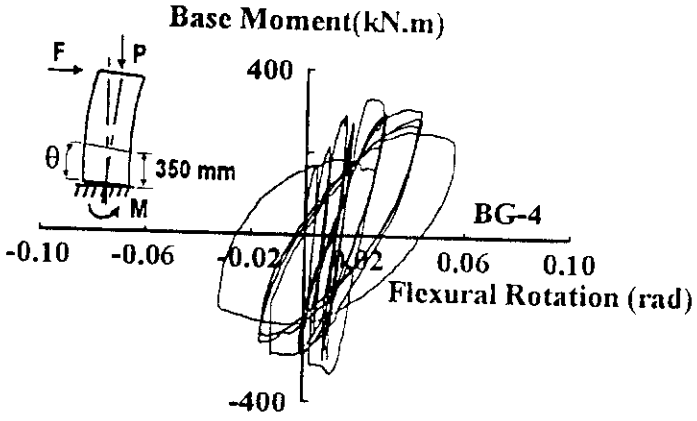


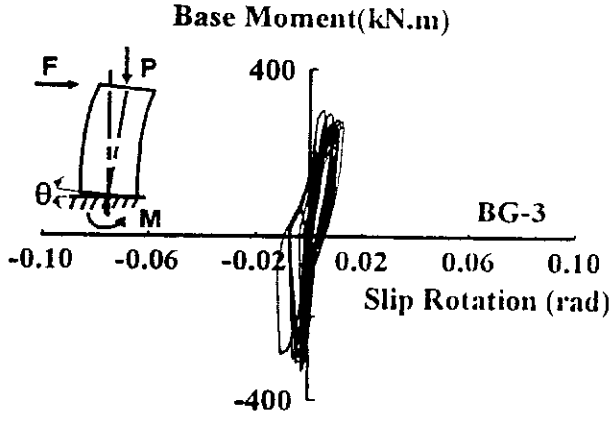
Fig. A2 Moment-Rotation Relationships for BG-2











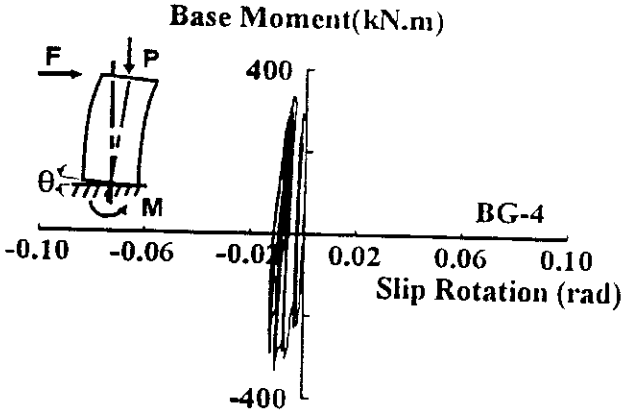
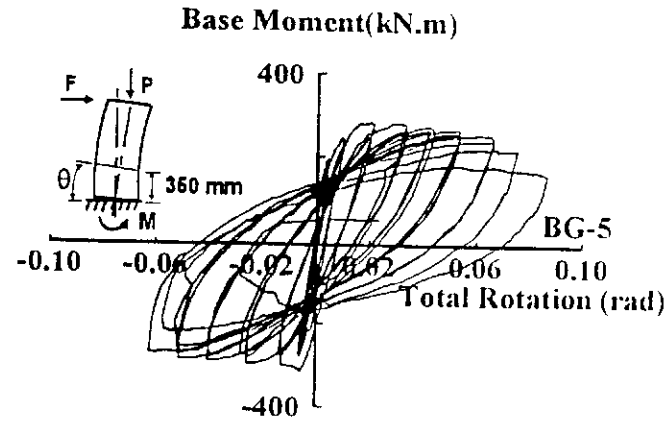
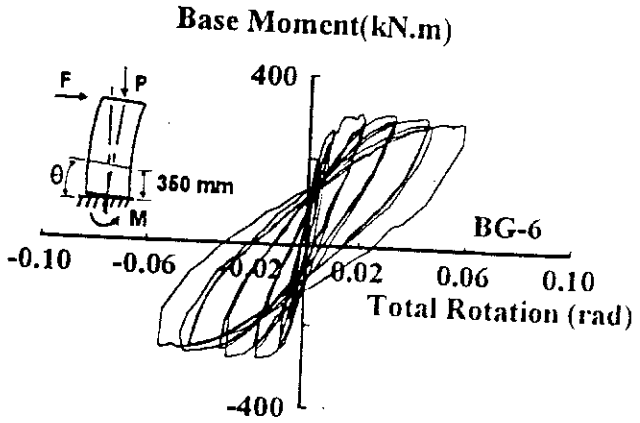
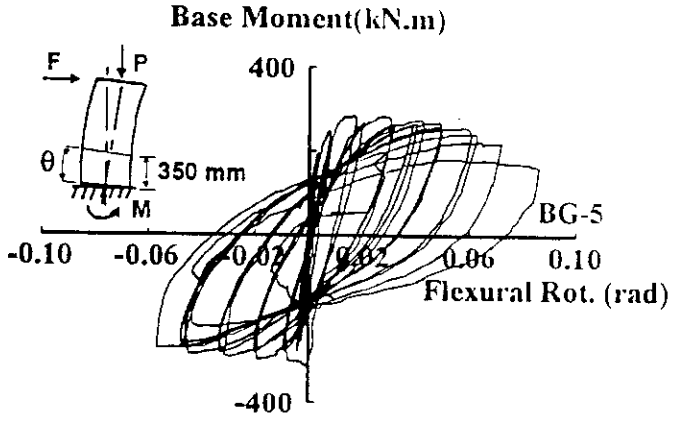


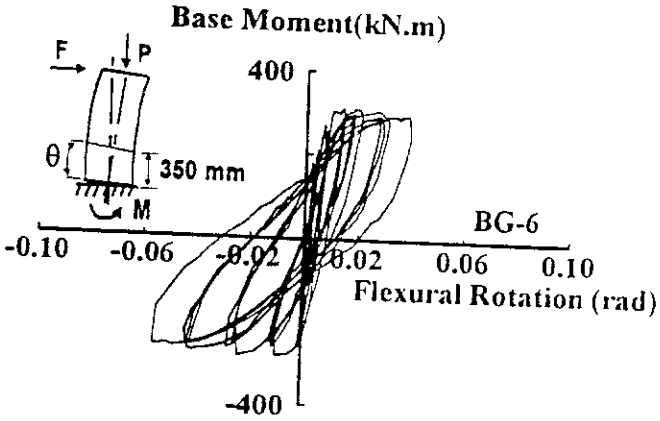
Fig. A3 Moment-Rotation Relationships for BG-3

Fig. A4 Moment-Rotation Relationships for BG-4









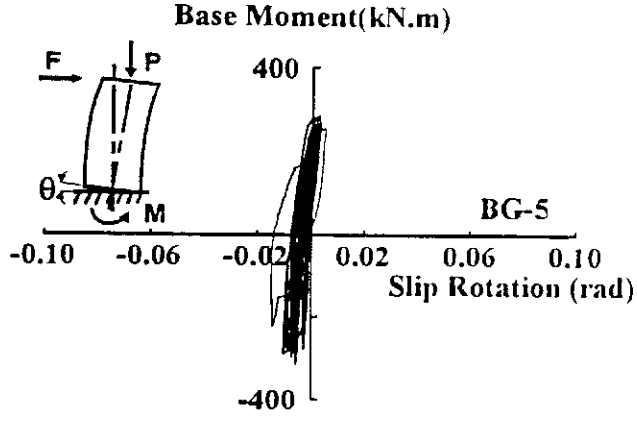


Fig. A5 Moment-Rotation Relationships for BG-5

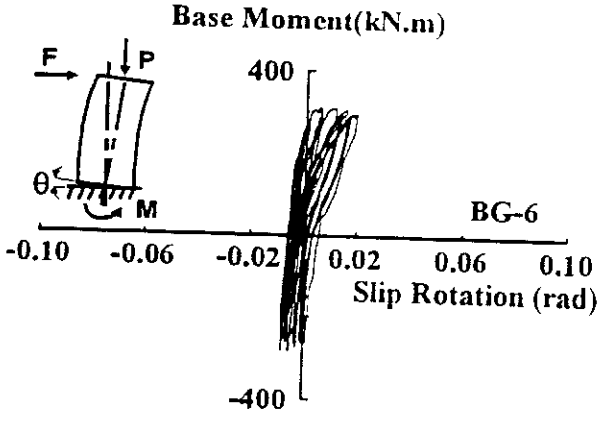
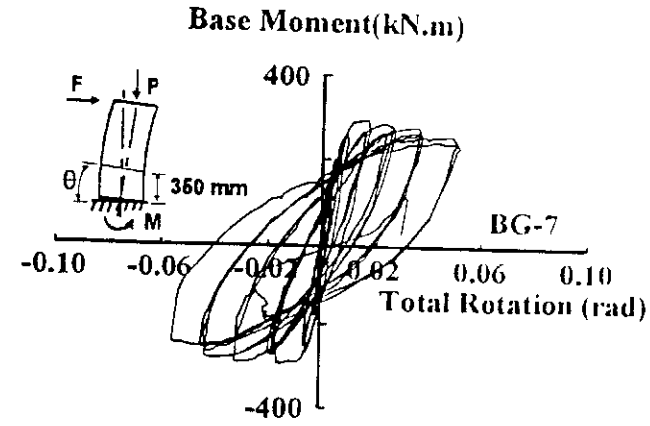
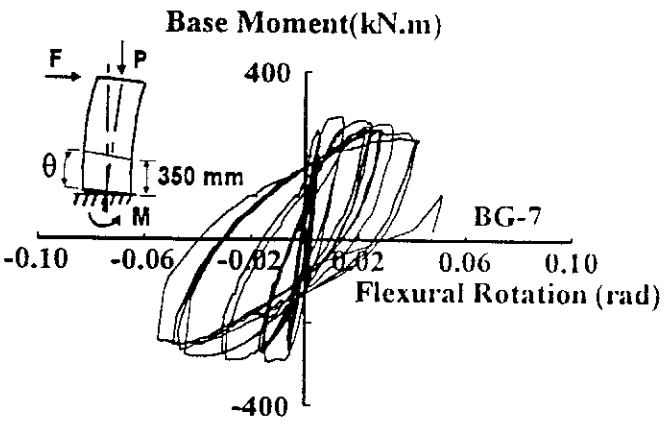


Fig. A6 Moment-Rotation Relationships for BG-6





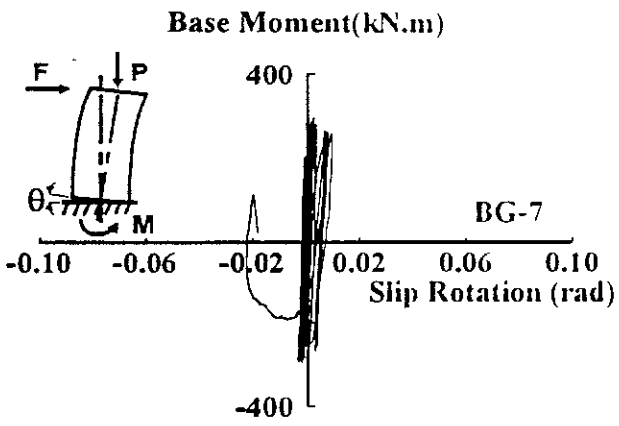
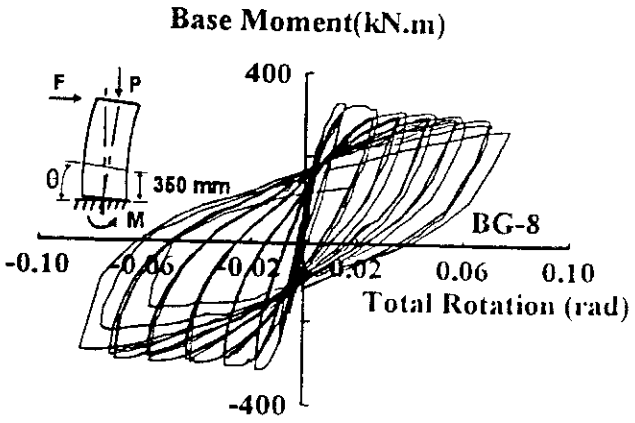
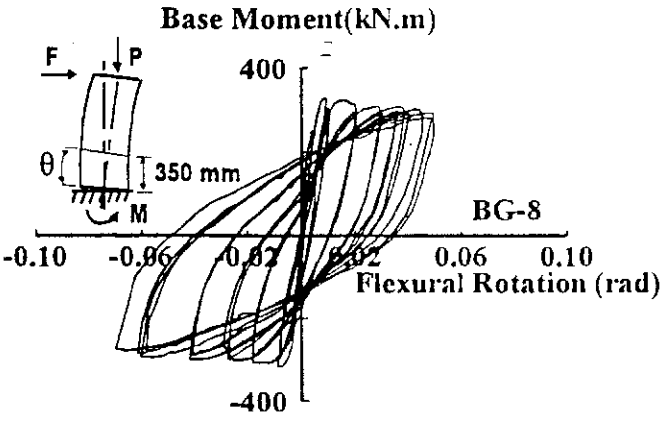


Fig. A7 Moment-Rotation Relationships for BG-7





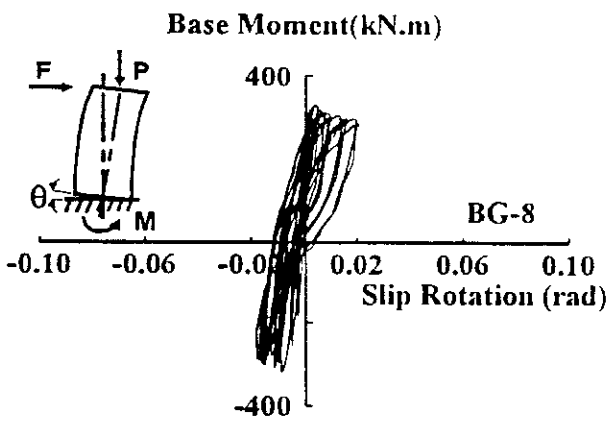
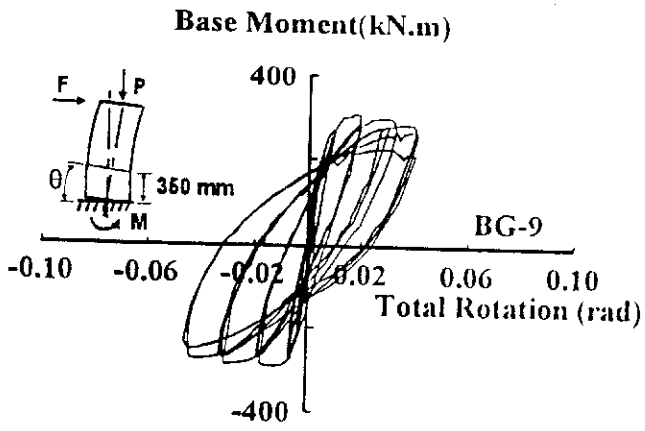
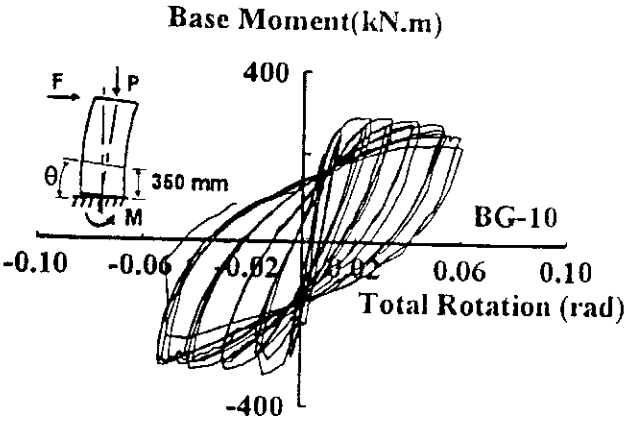
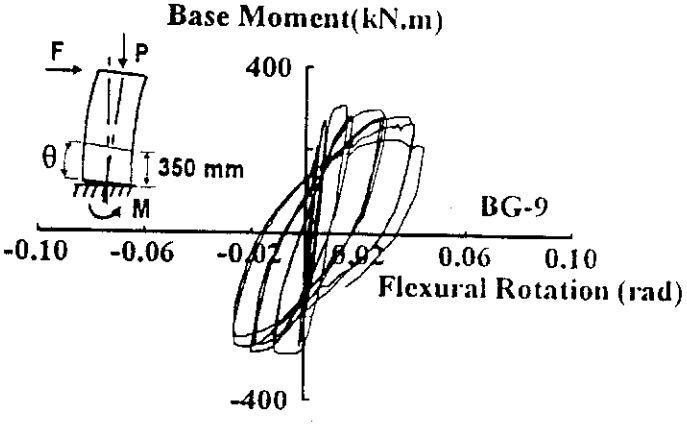
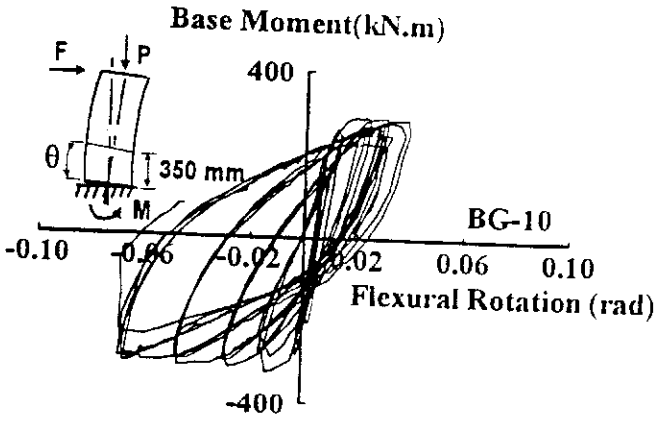


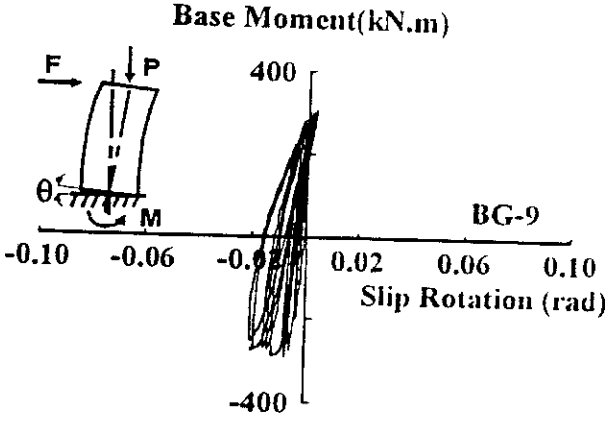
Fig. A8 Moment-Rotation Relationships for BG-8











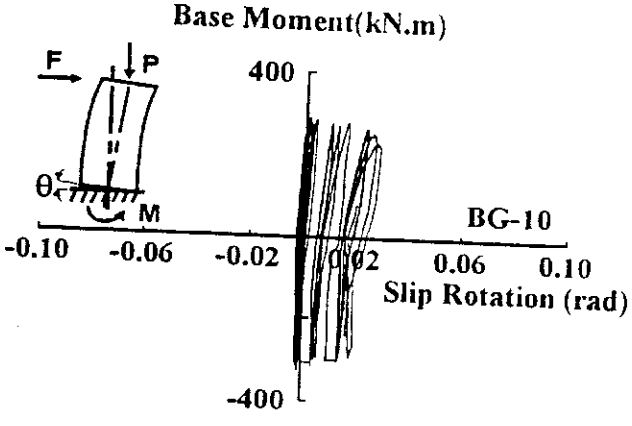


Fig. A9 Moment-Rotation Relationships for BG-9

Fig. A10 Moment-Rotation Relationships for BG-10

APPENDIX - B -

Strain Data Recorded During Column Tests for Longitudinal Reinforcement

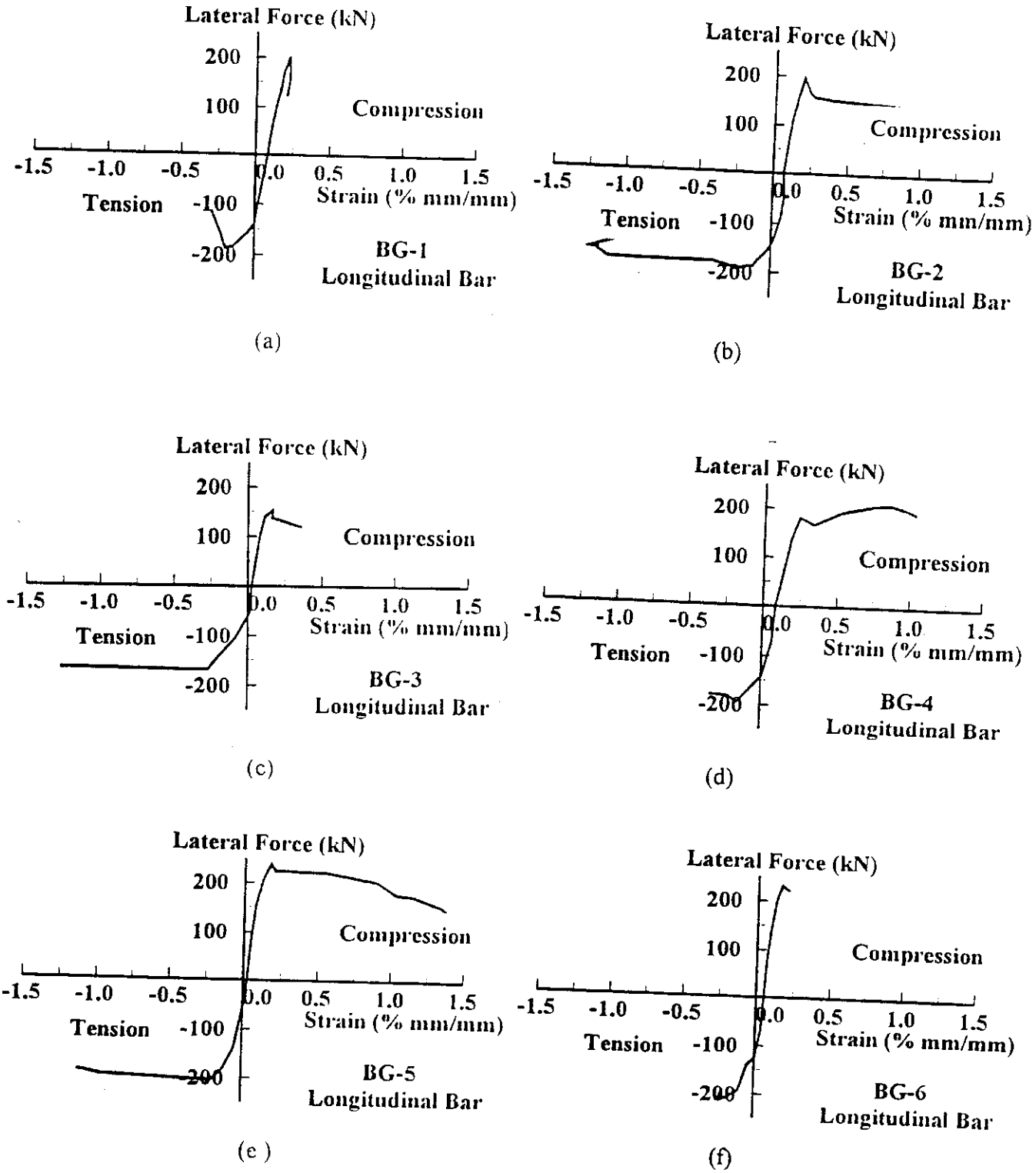
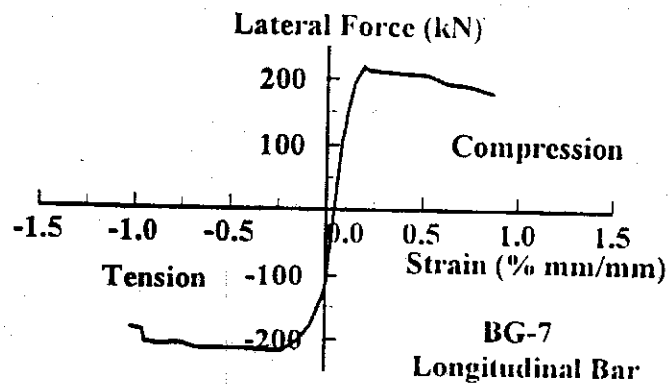
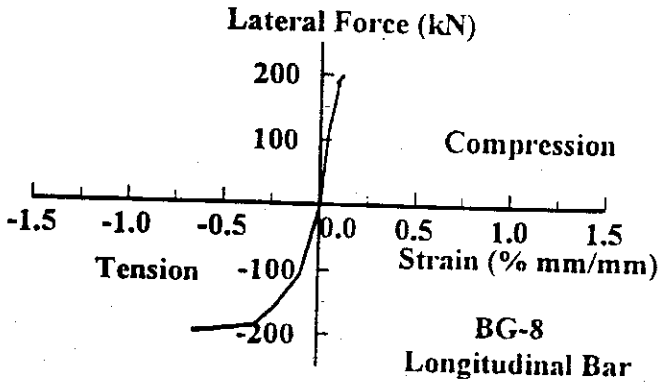


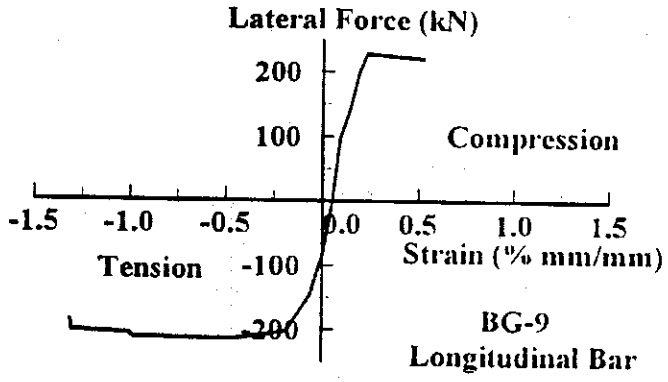
Fig. B1 Strain in Longitudinal Reinforcement at 50 mm Below the Column-Footing Interface



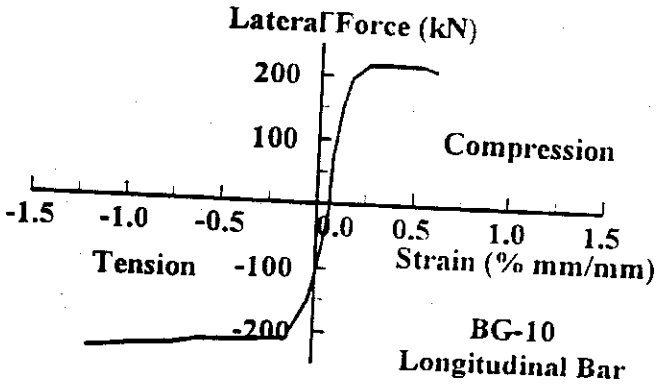
(g)



(h)



(i)



(j)

Fig. B1 Strain in Longitudinal Reinforcement at 50 mm Below the Column-Footing Interface (Cont'd)