CODE

COMMENTARY

mental data or are specified in documents such as ASCE/SEI 41, ACI 369.1M, TBI, or LATBSDC.

Sufficient number of fibers along the cross section should be used to allow the strain values at fiber centerlines to be extrapolated to locations where strain values are calculated to compare with strain limits, such as, at the extreme edge of the wall compression zone.

For structural walls or coupling beams modeled using fiber elements, deformation acceptance criteria can be represented in either a strain or member deformation basis. The strain results can be obtained directly from the fiber model. The member deformation results, such as plastic hinge rotation, story drift, or chord rotation, can be obtained by aggregated deformation over a group of fiber elements representing the member. Plastic hinge length Eq. (A.10.2a) and (A.10.2b) for walls are from Paulay and Priestley (1992).

An example of acceptance criteria for strain limits is provided in TBI (2017). The unconfined concrete model includes a peak stress at a compressive strain of 0.002, with a descending backbone to 50 percent of the peak stress value at a compressive strain of 0.003 (the ultimate deformation capacity, D_u). The confined concrete model, used where confinement meeting the requirements of 18.10.6.4(e) and (f) are provided, includes a peak stress at a compressive strain 0.008, with a descending backbone to 80 percent of the peak stress value at a compressive strain of 0.015 (the ultimate deformation capacity, D_u). The longitudinal reinforcement tensile strain limit of 0.05 (the ultimate deformation capacity, D_u) is based on tensile rupture with consideration of low-cycle fatigue effects, which is corroborated by Segura and Wallace (2018).

Additional references for ultimate deformation capacity, such as ACI 369.1M, TBI (2017), and LATBSDC (2017), may be used subject to approval of the independent structural design review.
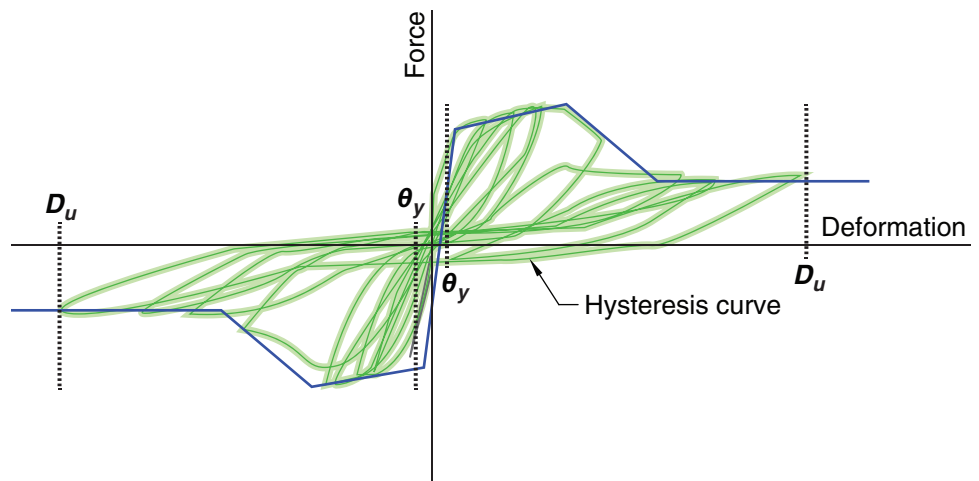
A Nonlinear

Fig. RA.10.2—D_u in response hysteresis from an analysis model.