Precast Concrete Frame Connection

Thomas A. Sabol, PhD, SE
Principal, Englekirk Institutional
Adjunct Professor, UCLA Department of Civil & Environmental Engineering

January 16-17, 2014 - University of California, Los Angeles
Introduction

- Traditional RC Ductile Frame Beam-Column Connection

Good ductility but lots of damage
Alternative Approach – Precast Beam

- Connector absorbs post-yield rotation and limits damage to concrete

Hybrid Beam
Alternative Approach – Precast Beam

- Initial Dywidag Ductile Connector (DDC)

![Diagram of Dywidag Ductile Connector](image)
Alternative Approach – Precast Beam

- Refined Dywidag Ductile Connector (DDC)
Alternative Approach – Precast Beam

- Dywidag Ductile Connector (DDC)
Alternative Approach – Precast Beam

- Dywidag Ductile Connector (DDC)

Joint shear behavior
Alternative Approach – Precast Beam

- Dywidag Ductile Connector (DDC)

Shear transfer via steel to steel contact
Alternative Approach – Precast Beam

- Dywidag Ductile Connector (DDC)

5% Drift (third cycle)
Alternative Approach – Precast Beam

- Dywidag Ductile Connector (DDC) (modified specimen)

2.65% Drift (first cycle)  
7.07% Drift (third cycle)
Alternative Approach – Precast Beam

- Dywidag Ductile Connector (DDC)

Construction Sequence
Alternative Approach – Precast Beam

- Dywidag Ductile Connector (DDC)

Construction Sequence
Alternative Approach – Precast Beam

- Dywidag Ductile Connector (DDC)

Construction Sequence
Alternative Approach – Precast Beam

- Dywidag Ductile Connector (DDC)

Construction Sequence