

## **Designing and Testing of Augered Cast-In-Place (ACIP) Piles for a Bridge Foundation**

### **Presentation by**

C. Vipulanandan (Vipu), Ph.D., P.E.  
Chairman and Professor  
Director of CIGMAT  
Department of Civil & Environmental Engineering  
University of Houston

### **ABSTRACT**

Continuous flight auger (CFA) piles better known as Augered, Cast In-Place (ACIP) piles have been widely used in the United States for several decades because of relatively rapid installation and minimum environmental impact during installation with comparable cost to other foundation systems. However, their use in transportation projects has been limited to small secondary structures such as sound barrier walls and overhead signs that exert relatively very small bearing loads. In this implementation project, a new bridge was designed and constructed entirely with 64 ACIP piles by Texas Department of Transportation (TxDOT) at the intersection of Krenek Road and highway U.S. 90 in Crosby, Texas. This study was undertaken to verify whether ACIP piles could be used as an alternative to driven piles with acceptable in-service performance for bridge foundations in the Pleistocene soils of the Texas Gulf Coast region. Measured settlements in various components of the bridge were less than 0.12 in (3 mm). Most of the load transfer was along the shaft of the ACIP piles and no tip resistance was measured for pile tipped in sand. Load-displacement behavior of the ACIP pile was modeled. Based on the ultimate load capacity, ACIP pile was cost-effective compared to a driven prestressed concrete pile.