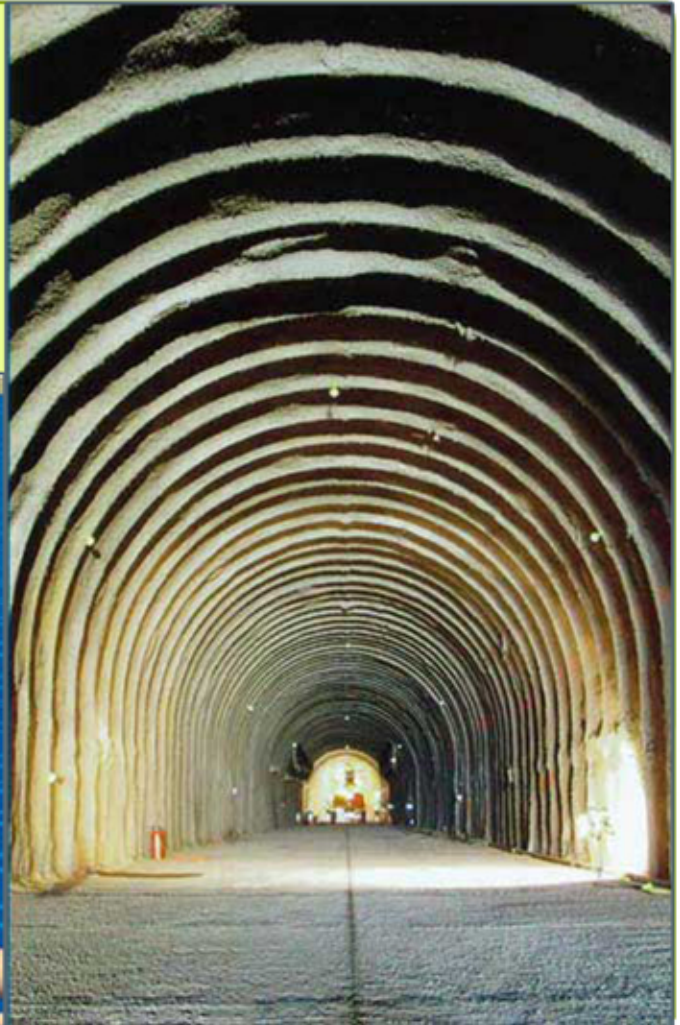


### Stanford LCLS Tunnel

Stanford University, Menlo Park, CA

October 2006

2,000 feet of underground tunnel and 230 feet of excavated cavern to house the world's first x-ray 'hard' laser – the Linac Coherent Light Source – at the Stanford Linear Accelerator Center, operated by Stanford University for the U. S. Department of Energy. This \$250 million project involved fiber-reinforced shotcrete wall and ceiling linings produced using Quikrete-brand Shotcrete MS mix with pre-dry-blended macro-synthetic fibers.



### Project Description:

**Owner:** U. S. Department of Energy

**Location:** Stanford Linear Accelerator Center – Stanford University, Menlo Park, CA

**Dates:** October 2006 Ground-breaking through December 2008 Completion

**Fiber:** FORTA-FERRO® 1-1/2" long macro-synthetic fiber

**Fiber Dosage:** Dosages of 5, 12, and 17 lbs./cubic yard to achieve specified toughness (ARS) values; total volume 68,000 lbs.

**General Contractor/Construction Manager:** Turner Construction

**Tunneling Contractor:** HMM (Hatch Mott MacDonald)



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