

**Cathedral of Christ the Light – Oakland
Post-tensioning rod Axial Force Study**

During construction of a new cathedral in Oakland, VGO was retained to design, install and monitor strain gage systems to determine the axial force in the pretension rods. Of particular interest was determining an installation procedure which would minimize the effect of tightening on adjacent rods.

Twenty-five of the 200 rods in the structure were selected for instrumentation. The selected rods were instrumented with electrical resistive strain gages configured in a Poisson full-bridge configuration. This configuration maximizes axial sensitivity while remaining insensitive to bending strains.

Measurements were made during tightening and torques calibrated to ensure proper axial loading. Tests also indicated optimum tightening procedures to reduce effects from nearby pretension rods.

Thermal effects as the rods and structure were heated by the midday sun were accounted for and included in tightening procedures.



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