

CASE STUDY

Loading - RC Strut for Top-Down Construction



BACKGROUND AND OBJECTIVE

To speed up shaft construction, RC struts must reach 70% of 40 MPa strength quickly. However, with the current method of using standard-cured concrete cubes, G40 PBFC concrete gains strength too slowly, risking delays. To stay on schedule, the project considers switching to G60 concrete, which saves two weeks but adds a six-figure cost.

Meanwhile, in-situ concrete benefits from heat generated during hydration, curing faster and achieving higher early-age strength than standard-cured test cubes.

SOLUTION BY CONCRETEAI

ConcreteAI's **SmartCure system** utilizes temperature-matched curing (TMC) - concrete cubes are cured at the same temperature as in-situ concrete. This method is BCA-approved and is accepted by the project team.

Once the TMC cube reaches the target strength, the project is granted approval to proceed with excavation based on the results.



BENEFITS

TMC cube results show that **in-situ G40 PBFC concrete reaches 28 MPa in 3 days**, whereas standard-cured cubes take 7 days. The waiting time is **reduced from 7 to 3 days per layer**, saving a total of 2 weeks across 4 layers.

This ensures the project stays on schedule while eliminating the need for costly G60 concrete, maintaining both productivity and cost efficiency.

COST-BENEFIT ANALYSIS

ConcreteAI's solution delivers the same time savings as upgrading to G60 concrete, while reducing concreting costs by over \$250k, after accounting for ConcreteAI's cost.

Target Strength	Time Taken for Standard Cured Cube to Reach	Time Taken for TMC Cube (in-situ concrete) to Reach
28 MPa	7 days	3 days

