Background

Southport Central is a large three tower residential and commercial precinct developed by the Raptis Group at Southport, on Queensland’s Gold Coast. During construction, the triple-tower development was the largest mixed-use development under construction in Australia. When complete, Southport Central will deliver 730 new luxury apartments, some 350 commercial office suites and 75 ground-floor retail tenancies.

Tower 1 (40 stories with 3 basement levels) was completed in 2006 without the need for blasting. The design for Towers 2 and 3 called for six and seven basement levels respectively. Excavation for Tower 2 had reached basement level 3 when rock was encountered. The rock defied the earthmoving contractor’s best attempts at productive ripping using a 110t bulldozer and a 50 t excavator, so the call for blasting was made.

Urgent Need

With every day’s delay in excavation causing the project schedule to slide, there was intense pressure to get blasting started as fast as possible. Ross Oldman, Orica’s Contract Manager for the project said “The whole project was basically at a standstill, waiting for us to get to work. Typically inner city blasting projects can take months to set up, however thanks to the co-operation of Rapcivic and the Gold Coast City Council, mobilization in this case was very fast. Blasting work on the Tower 2 basement commenced within 2 weeks of getting the call from the client.”

Novel blasting method saves time

Blasting in a busy CBD environment requires special techniques to reduce adverse affects on the public and surrounding worksite. Conventional blasting methods would have required firing one small blast every afternoon. Using this method over 120 blasts would have been required to complete the excavation and this in turn would have increased the project duration by several months. Each blast requires road closures and shutting down a portion of the worksite, so the daily disruption to workers and neighbours would have been considerable and costly.

To reduce delays and costs, Orica developed unique methods to fire one large blast a week instead of a small blast every day, and thereby reduce the overall number of blasts required to complete the project. The innovative method involved loading blastholes with up to five individual explosive decks with each charge firing separately to control vibration levels. Electronic detonators were employed to allow large, complex blast geometries and guarantee the security of loaded blastholes. Martin Adam, Orica’s Principal Blasting Engineer says “The largest blasts were loaded over the course of 5 days, so we had to be sure nothing could happen to the explosives in the ground each night. Electronic detonators are virtually impossible to activate unintentionally once in the ground, so they were the best choice in this case”.

Community Relations

Blast vibration levels were managed to minimize the overall impact on the neighbouring residents and businesses. This meant not arbitrarily targeting the lowest vibration levels, as this would have increased the number of blasts and duration of persistent drilling noise by several months. Instead, higher (but still safe) limits were used, in conjunction with a system of
positive engagement with the neighbours to ensure there were no surprises.

Martin says “By talking to the neighbours we found that as long as they knew exactly when the blast was going to occur, the blast effects were not upsetting. Therefore, we aimed to fire one big blast a week, making absolutely sure everyone knew exactly when it was going to occur, and then sticking to that time even if the blast was ready a day early.”

Each blast clearance involved up to 20 blast sentries, clearing workers from the towers under construction, stopping traffic on 2 streets, and temporary closure of the busy Gold Coast City Council Library across the road.

Janet Worden, Head Librarian at the Library coordinated the closure of the library for three to five minutes for each blast. “The key was to make regular PA announcements inside the library several times for the 30 minutes prior to each blast” said Janet. “That way everyone in the library knew what to expect, and when it was going to occur. We need to have good procedures for managing the general public, so the blasts were a good chance for us to put them into practice. In the end it became routine - we actually wish the blasts were a bit more exciting.”

For more information please contact:
Ross Oldman  0413 025 989
Contracts Manager - Construction
Martin Adam  0413 005 089
Principal Blasting Engineer

Southport Central – Project Details

Excavation Type: Basement Carparks
1 x 6 level, 1 x 7 level

Total Volume: Approx 50,000 bcm

Number of blasts: 30

Project Duration: 8 months

Environment: City Business District.

Nearest Neighbours: Busy city streets directly adjacent Carpark with large rooftop swimming pools (directly adjacent)
Office Tower / Café Precinct (12m)
Red Cross / Church Office (25m)
Public Library (25m)
Residential Dwellings (40m)

Nearest Utilities: Fibre Optic, High Pressure Gas, Water, Sewer, Copper in common trench <5m from site boundary

Blasting Method: up to 15m benches with multiple decks

Explosive Types: ~ 20,000kg packaged emulsion
~ 15,000 electronic detonators
Largest Blast Size:

800 detonators, 4000 bcm,
20W x 20L x 10D