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Specialist consulting engineering, safety and environmental management
for decommissioning; decontamination; dismantling; demolition.

Scientific precision results in successful demolition of 17-storey tower block

A redundant 17-storey tower block in Greenock has been successfully brought down by the controlled use of explosives, under the watchful eye of specialist consulting engineers RVA Group.

Social landlord River Clyde Homes made the decision to demolish Octavia Court's 101 outdated flats as part of their regeneration strategy for the area. But having acknowledged that it did not have the in-house expertise to competently and safely bring down the 50m high structure, the not-for-profit organisation sought bespoke guidance from an external consultancy.

Appointed via a rigorous tendering process in March 2010, RVA Group was engaged to project manage the demolition programme and provide CDM (safety) coordination, from the outset, whilst also offering independent structural and explosives engineering insight. The project team was completed with the appointment of Coleman & Company as principal contractor.

Because the safety of the community and neighbouring stakeholders was paramount, it was evident that demolition of the 6,500 tonne concrete and brick structure required meticulous planning and robust scientific methodology. But the close proximity of an electric Network Rail commuter line – the boundary of which sat just 3 metres from Octavia Court – posed an added challenge. It was essential to protect the rail infrastructure during the demolition, whilst ensuring disruption to rail services was kept to an absolute minimum.

The exact science of implosive demolition by far posed the safest and fastest methodology for demolishing the tower block. Not only would the alternatives of mechanical demolition or floor by floor dismantling have increased the possibility of debris falling onto the railway line, but a longer demolition period would have heightened the potential risk for project workers and the community. Furthermore, the controlled use of explosives meant that only one railway line possession would be required, and if the blowdown took place at night, disruption to commuter services would be minimal.

A six-month on-site preparation period then commenced. Old furniture was cleared from the building before a four-week asbestos removal phase and subsequent nine weeks of soft stripping began.

When left with just a concrete shell, the team then began explosives preparation by pre-weakening five blast floors. Sections of wall were deliberately removed, before 550 holes were drilled in key structural positions. Drilled members were then wrapped with chainlink fencing and high performance plastic sheeting to contain explosives-driven fragments, and one week prior to the blowdown, the drilled holes were charged with a total of 10 kg of explosives.

The explosives were then connected with an intricate initiation and back-up system to detonate the charges in a sequence of small delays to produce the desired mode of collapse. A 150m exclusion zone was put in place around the tower to keep the public safe, and necessary security precautions were taken until the implosion took place.

Working in the dark posed an additional challenge for the team on paper, but RVA's experience of managing over 50 explosives demolition projects meant that this did not cause any issues. Brought down at 02:30 to minimise disruption to the railway line, Octavia Court was demolished in less than 10 seconds. The tower successfully fell as designed, and as there was no debris on the line whatsoever, Network Rail's assets remained intact.



The team then inspected the rubble mound to ensure it was stable and no undetonated explosives remained. Debris and dust were cleared from the road, and house exteriors cleaned. This military-style exercise meant that 250 residents of the neighbouring 130 properties could return to their homes by 8am that day.

Of the 6,500 tonnes of rubble, a small amount has been crushed for use as backfill material for the new site, whilst the rest has been processed into aggregate for use on other civil engineering projects in the Inverclyde area. With the removal of foundations and the formation of new building construction platforms now complete, the new build contractor has moved onto site to commence work on the construction of 14 terraced and semi-detached houses.

Commenting on the success of the demolition, River Clyde Homes' regeneration manager Russell Smith said: "We have been delighted with RVA's outstanding performance and attention to detail throughout every step of the project. Teamwork, effective communication and close coordination of all parties, meant that site operations were carried out safely, the integrity of Network Rail's assets was not compromised and ultimately the demolition programme was a great success.

"We now have a great footprint of land upon which to create modern family housing for up to 56 people."

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