AIR EXCAVATION

The power of air for root retention and tree relocation

It's a relatively new technology in New Zealand, but air excavation is quickly becoming the favoured option for soil removal where trees are near. Air excavation can also be utilised when relocating mature trees – especially in challenging situations such as when the tree roots are close to services (power, water, gas).

"Seeing is believing, when it comes to air excavation," says Mike Dargaville, operations manager at Auckland specialist excavation company, HydroVac. "With a 25000 CFM vacuum and 10-inch boom, these trucks can air excavate rocks the size of bowling balls BUT they leave even the finest tree root intact – it's amazing."

Instead of using water or shovels, air excavation trucks use an air lance (AirSpade) to gently loosen the rocks and dirt from around the roots – these are similar to a waterblaster but instead of water they use compressed air. Then a powerful vacuum is used to suck up and remove the resulting rubble.

As well as excavation, HydroVac's AirSpade can be used for soil management and tree health-care, too. Because you can use air to remove or loosen soil without damaging a tree's delicate root system, it's a great tool for stewardship of valuable and established trees, offering air tilling, radial trenching, soil aeration, vertical mulching and decompaction. It can also be used for soil replacement for trees in poor soil or for corrections to root structure.

HydroVac also offer hydro-excavation but says when you compare the two, air excavation is the clear stand-out when it comes to tree-related work. Airflow is measured in CFM (cubic feet per minute): air excavation is 25000 CFM, compared to hydro-excavation's 1800-5000 CFM.

Beyond sheer power, there are cost and sustainability benefits too.

Air doesn't damage roots, whereas water strips the bark off the trunk and roots.

With air, excavated material remains dry, so you can reuse the material on site – to reinstate holes or trenches. Being able to reuse the material on site saves on disposal costs and travel costs (from not having to dispose mid-job) and there's no water disposal costs. If you don't use the excavated material on site, it will still cost less to dump than hydro-excavated material because it doesn't have water added to the mix.

HydroVac's Dry X trucks offer an extensive reach of 150m so they also work well in smaller, hard-to-reach areas. The trucks have been configured for reduced noise pollution, helpful for work in suburban areas, and are fitted with an unique filtration system that prevents them from emitting dust into the atmosphere when they operate.

Perhaps most importantly, using air is a significantly safer way to excavate around utilities. Using air instead of water or shovels means there's no risk of damage to high-voltage wires or gas or plumbing, which is why air excavation is quickly becoming a firm favourite with construction and utility companies needing to dig around services.

HydroVac's two air-X trucks have found favour with many HydroVac's customers, including the Motorway Alliance, Fulton Hogan, Auckland Council and Vector – working on notable projects including the Central and Northern Interceptors and the City Rail Link, as well as smaller jobs like residential home builds and historical digs.

HydroVac say the awareness of air excavation for tree removal is increasing, which has led to some rewarding jobs in the past 12 months. Last year they used air excavation to remove five mature pohutukawa trees from along Princes Wharf as part of the Downtown Transformation project. The trees were 30-40 years old and ranged between 8-10m tall, with root balls around 3.8m wide by 60cm deep.

To add to the challenge, at some point the trees had large amounts of concrete poured around their base, constricting their growth. This needed to be carefully broken away with jackhammers. Complicating things further, there were large services running through the concrete and tree roots — both power and gas — that would be catastrophic if hit.

"This was definitely a job for our Dry X," says Mike. "The stakes were too high to have a digger doing the work, and flooding the hole with water with hydro-excavation wasn't an option with the services running through the job. Air excavation is ideal for these kinds of jobs. Air is a powerful excavator but gentle enough to work around dangerous in-ground services as well as not harming even the finest roots."

HydroVac operators are currently using the same air excavation technology on a City Rail Link (CRL) job, removing old mature trees from the city centre – many of which run over live wires and pipes.

For an air excavation demonstration or to see the Dry X trucks in use, please contact mike.d@hydrovac.co.nz or see www.hydrovac.co.nz

HINO