

MBR and Fine Screen Building Excavation

Location: Lower Molonglo, ACT | Project Value: \$385M | Client: Seymour Whyte | Duration: February to July 2026

KEYWORDS

Construction, Civil, Excavation, Surface miner, Hard rock, Vibration limits, Drilling, Ground Support, soil nails, Shotcrete, surface miner, trench, footings, post tensioned.

INTRODUCTION

EA were awarded the bulk excavation package, \$3.5mil for two new building on the lower Molonglo water quality control centre project which comprised the bulk excavation and ground support of the MBR and Fine Screen Building. The excavation was completed in dacite ranging from 20MPa 230MPa with sections of general fill in areas adjacent to historic structures. In the locations where excavation was in fill ground support was required to ensure stable cuts and minimise movement of the existing infrastructure. Ground support requirements were a single layer of mesh reinforced shotcrete and 3-5m self-drilling soil nails.

CASE STUDY DETAIL

The excavation of the building to basement level was challenging on this project due to the high strength of the rock and the vibration constraint imposed from the existing infrastructure directly adjacent to the cut. Considering these constraints EA proposed the use of a specialised Surface miner to excavate the hard rock.

Excavation in rock:

The excavation of rock was directly adjacent to the existing water treatment plant which had to remain operational 24/7. Given the age of the existing building there was concerns with ground movement damaging existing infrastructure and stopping the plant from running which would have been catastrophic for the client. For this reason the direct drive machine was used to excavate the rock as the rock could be mined with low vibration impact. In addition to meeting the vibration constraints the built in scrubber system minimised the dust generation and the mined material, 150mm minus was able to then be reused as general fill elsewhere on the project saving disposal, import and material costs.



Figure 1. Excavation rock, 1255 Surface miner

Shotcreting

A self-powered midjet was used to allow easy manoeuvring along batters. Robotic Boom spraying was opted for to allow a longer reach and increased batter heights before spraying was required. The Midjet boom had a 6m reach which allowed 3-5m lifts before spraying was required, except where geotechnical advice required it sooner. Concrete agitators fed directly into the hopper of the midjet as access was available directly from the road.



Figure 2. Midjet Spraying Batters

Soil Nails and mesh

A section of the excavation was in general fill and also next to critical infrastructure, to ensure no movement in the ground occurred soil nails were installed along this section. EA used a drilling attachment on an excavator to install the self-drilling anchors into the batter. The nails were then grouted and the batter covered with mesh and sprayed with shotcrete.



Figure 3 Drilling Soil nails