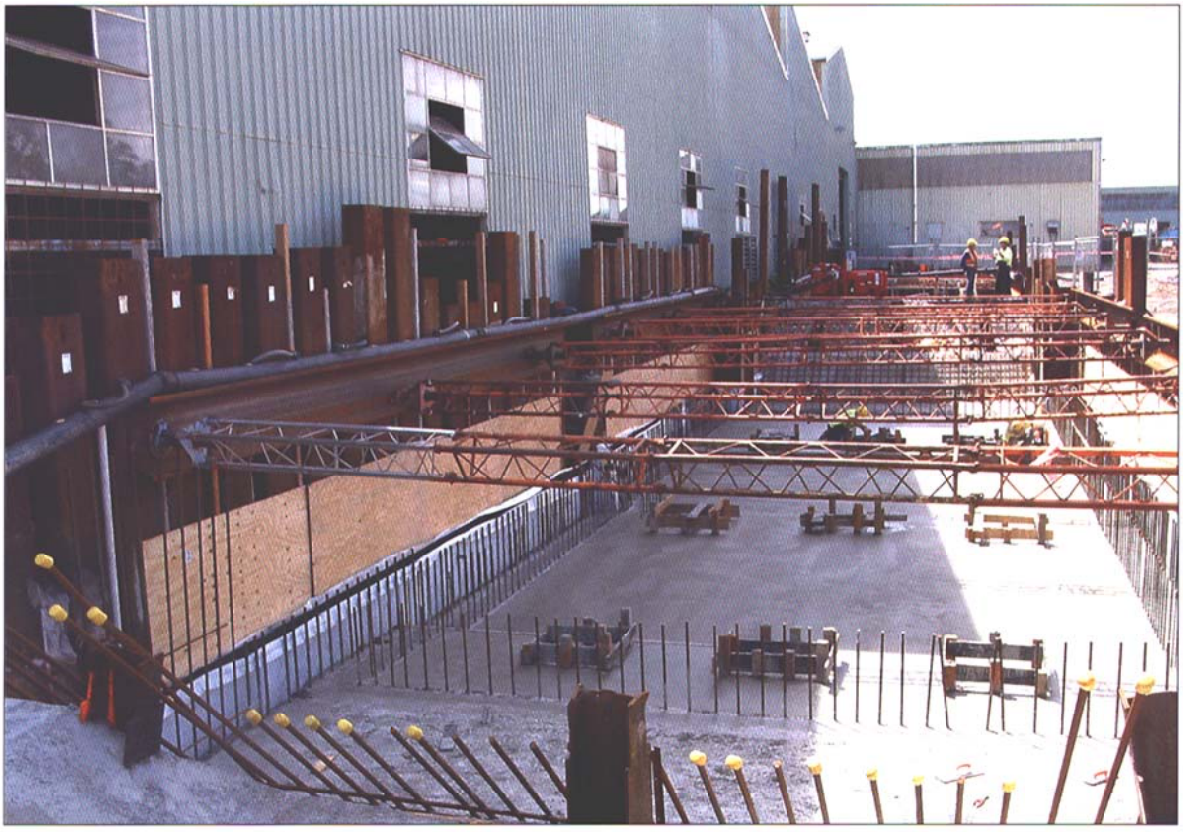
Big base for a Big Machine



It takes a lot of concrete to tie down a massive machine than can turn out wire rope strong enough to hold a supertanker. This is happening at OneSteel's Wire Ropeworks expansion of its Mayfield, Newcastle, site to accommodate a massive new wire rope closing machine. Milleen Constructions is responsible for the associated building and civil works to house the new machine that is to be commissioned in September 2004.

The new wire rope closer is capable of manufacturing wire rope up to a 203 mm diameter in both six and eight strand constructions and in single parcels up to 150 tonnes in weight. Rope closing is the final operation in wire rope manufacture where strands are formed into their helical shape and wound about a core. The facility will also include a 150 tonne capacity reel trolley for the purpose of storing the large reels and lifting them ready for transport off site.

Apart from the huge size range of this machine, it is unique amongst rope closers anywhere in the world because of the use of individual drives to control all aspects of rope closing. This lends an enormous versatility as to how the machine can be run and controlled when compared with the traditionally geared machines that also use mechanical braking. It will also lend to a much quieter and smoother running rope closing machine.

The extension of the Wire Ropeworks is approximately 18 metres wide, 90 metres long, and 13 metres high. The superstructure is portal framed, metal clad steelwork required to support a new 25 tonne crane, and an extension to a 50 tonne crane. The substructure is reinforced concrete supported by steel piles driven to bedrock. In total, 168 steel I-section piles, driven to a depth of approximately 18 metres, support the new extension - 40 support the building superstructure, and 128 support the machine foundations. The machine foundations were excavated to a maximum depth of 5 metres.

The overall length of the rope closer is approximately 70 metres. Beneath the machine is approximately 1500 cubic metres of concrete containing 200 tonnes of reinforcement supported on the steel piles. The concrete in the base of the machine pits vary from 0.8 to 1.8 metres in depth. The walls vary from 0.45 to 0.6 metres in width with a height varying from 3 to 4 metres. During construction of the pits, dewatering spears were installed to keep the foundations dry from the relatively high water table. To ensure that vibrations caused by the rope closer are transmitted to the piles and bedrock rather than to the soil surrounding the foundations, isolation material 40mm thick was placed on the outside face of each wall.

The floor surrounding the machine is 250 mm thick reinforced concrete, required to support 10 tonne forklifts and reels containing 20 tonnes of wire. The footprint of the floor surrounding the machine is approximately 1300 square metres, with the footprint of the machine approximately 800 square metres. Beneath the floor slab are conduits and pits for electrical and pneumatic lines for supply to the machine.