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modern methods of paving

MACHINE INSTALLATION OF CONCRETE PAVING BLOCKS

Interpave
THE PRECAST CONCRETE PAVING AND KERB ASSOCIATION

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Modern methods of paving

Concrete block paving meets today's 'Modern Methods of Construction' requirements for fully engineered, prefabricated products and the increasing use of efficient, fully mechanised site processes adds to this. In Germany and some other countries, machine laying has been the norm for many years and is used on even the smallest jobs. Here in the UK, the proportion installed mechanically is growing rapidly, particularly as more forward-thinking contractors invest in readily-available equipment. Opposite are just three recent examples of machine laid concrete block paving projects.

Machine laying principles

Basically, a hydraulically operated clamping system is used to lift a 'cluster' of concrete paving blocks, about 1 square metre in area and already in the required laying pattern. Clamps can be fitted to a variety of site equipment or form an integral part of a dedicated machine designed for good site manoeuvrability. While the machine does all the work, there is sometimes an operative guiding the cluster into place, as well as the machine driver.

There are various shapes available, as well as standard rectangular blocks in various patterns, including herringbone which some manufacturers offer ready for machine laying. The speed of laying depends very much on site organisation, travel distances, machine types and other factors. But 1,500 square metres or more per day is easily achievable – contrasting with no more than 50 square metres per person for manual laying. Productivity is comparable with asphalting operations. The ability to deploy a block laying machine and crew at short notice to meet 'just in time' demands on sizeable projects is a major benefit. But there are also benefits in using the technology on modest sized projects, as well as larger schemes.

Faster installation means earlier completion and less operational down-time of the paved area – not forgetting that block paving can be used immediately after completion without curing times. But machine installation also makes it easier to consistently achieve accuracy and uniform joint widths as machine laying is less tiring on operatives. To maximise the efficiencies of mechanical laying, installers are examining all the other site processes, such as mechanising other operations including laying and screeding the laying course, and delivering blocks close to the laying face – as shown here in some of the example photos.

Machine based screeding equipment speeds up the laying course preparation.

The laying course can also be placed particularly efficiently with a paver machine. A sonic sensor (on the left of the photo) controls the screed box to ensure a constant thickness.

A hydraulically operated clamping system is used to lift a 'cluster' of blocks already in the required laying pattern.

Banks of plate vibrators can be used for compaction.

For even greater efficiency, machine-mounted jointing material spreading and (as shown here) compaction equipment can be used.

There is even machine-mounted equipment available for brushing in jointing material.

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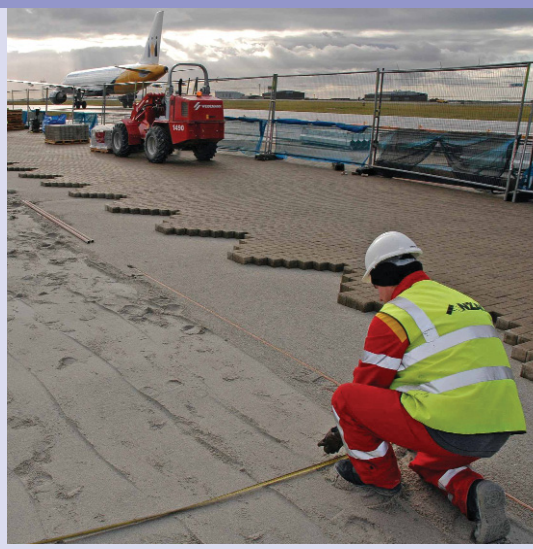
Newquay Cornwall International Airport



The ability to deploy a block laying machine and crew at short notice to meet 'just in time' demands is a major benefit – demonstrated by a recently completed airport project.

The new aircraft 'Parking Pan' at Newquay Cornwall International Airport forms an essential component in this busy airport's expansion plans. Designed to meet the needs of more flights and larger aircraft, such as the Boeing 737 and 767, the Parking Pan was the final phase of current airport expansion and needed to be ready to meet operators' strict schedules. The 3,500m² area was installed in just 10 days maximising the capabilities of machine installed concrete block paving techniques. Fast, efficient mechanised block laying means earlier completion and less operational down-time of the paved area.

Orpington Bus Depot

This replacement of unsightly asphalt and insitu concrete with machine laid concrete block paving offers another example of the capabilities of the technology to minimise operational 'down time' in critical applications.

Some 7,000m² was laid in sections without disruption to bus services because block paving can be used immediately after completion without the curing times demanded by some other materials. Also, the ability for block paving to be lifted and re-laid without scarring was demonstrated when additional barrier work was required after paving completion. The blocks were removed, barriers installed and the blocks replaced without the unsightly reinstatement associated with other formless paving materials.

National Exhibition Centre Car Parks

Mechanised techniques enabled tight deadlines demanded by the NEC's event schedule to be comfortably met. The project involved transformation of 57,000m² of car parking from an uneven loose compacted aggregate to a high quality, consistent concrete block surface.

Two different contractors worked in tandem to achieve the challenging 12-week construction period for the NEC's N10, 11 and 12 car parks. Up to four block laying machines were in use at any one time achieving some of the fastest installation rates ever completed in the UK, with up to 2,000m² being installed per day. Coordination and mechanisation of all the construction processes – not just block laying - was essential for this impressive performance to be achieved (as shown in some of the photos opposite).

Sustainability was also important with block deliveries on re-useable pallets and approved recycling contractors with on-site equipment for shrink-wrap disposal.

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