

CEMEX

Offset feeder delivers faster and better surfacing

Excellent results in terms of quality and speed of surfacing are being achieved with an impressive new piece of plant – the CEMEX Shuttle Buggy.

Independent analysis is under way to validate the true worth of CEMEX's latest surfacing innovation, but feedback so far is vindicating the firm's investment. At a cost of around £150,000, CEMEX UK Construction Services has introduced the Shuttle Buggy and already made a big difference to the speed and quality of at least one major surfacing project.

That was on the M6 towards the end of 2006 and the Shuttle Buggy has since moved on to assist projects elsewhere. This new piece of plant is unlikely to be restricted to just one or two uses each year. CEMEX has identified a range of different schemes that could make good use of the Shuttle Buggy and the whole UK roads sector could do the same.

The Shuttle Buggy is an 'offset feeder'. It

receives deliveries of asphalt on site and provides a continuous feed of material from the side of one or more paving machines via a pivoting conveyor arm. In the process, the Shuttle Buggy remixes the asphalt, restoring its uniformity of temperature (homogeneity is inevitably always lost to at least a small extent during transport) and therefore making it a more consistent and workable material.

Results from the M6 are excellent, according to CEMEX. Continuous supply of an asphalt that was fully compliant with its specification and with no waiting for delivery lorries to back up to the paver speeded up the operation, helping to lay 19,000t of material in four weeks – and resulting in a very smooth finish to the road surface. With lorries backing up to the Shuttle Buggy instead of the paver, the

usually unavoidable slight 'bump' in the new road surface caused by contact between lorry and paver was completely avoided.

This and greater homogeneity equates to enhanced ride quality. Research body TRL is now looking at the rideability achieved by the Shuttle Buggy as part of investigations related to possible introduction of a more stringent ride quality specification. Meanwhile, CEMEX has reports from its project team of "possibly the best job we have ever done".

"Up to 828t of PMB asphalt was laid in one shift." CEMEX

Furthermore, introduction of the Shuttle Buggy was first initiated to help surfacing operations specific to elevated carriageway in the Midlands. CEMEX occasionally works on these structures as one of the partners within the Highways Agency's Construction Management (CM) Framework team. The CM 'community of specialists' carries out all contracts worth between £500,000 and £8M on trunk roads in the HA's Areas 9 and 10 – including elevated stretches of carriageway around Birmingham.

These structures have historically suffered surfacing problems due to ingress of water combined with very heavy traffic wear (among other contributory factors including structural movement). Modern thinking on the best long term pavement solution specifies stripping down to the concrete deck then application of high performance waterproofing, an SA1030

Off-set feeding kept delivery lorries away from the bondcoat on the M6, ensuring a good bond between waterproofing and asphalt





Continuous supply of homogenous asphalt from the Shuttle Buggy speeded up the whole operation and helped produce a very high quality job on the M6

bond coat and PMB (polymer modified binder) asphalt to form the binder course beneath new regulating and surface layers.

The PMB asphalt forms a pavement layer highly resistant to water ingress and deformation – and therefore rutting – and a molecular reaction with the bond coat that virtually guarantees the binder course will not come away from its substrate. Providing all of the materials are laid correctly that is.

Activation of the molecular reaction is critical and driving asphalt delivery lorries over the bond coat is potentially disastrous because, before it is activated by the hot asphalt, the SA1030 may come away from the waterproofing if trafficked. Plus, PMB asphalt is known for not being the easiest of materials to lay in terms of achieving the correct finished level. Before introducing the Shuttle Buggy, CEMEX surfacing teams were achieving good results on elevated carriageway jobs, but the extra care needed to achieve them was slowing the work down.

Then came last year's M6 work. At a cost of around £2.6M, CEMEX was contracted to reconstruct 3km of southbound M6 carriageway, to the same modern thinking on pavement design, on the Bromford viaduct south of Junction 6. Work started at the end of September 2006 with CEMEX using its new plant for the first time.

The Shuttle Buggy was used in parallel to the paving machine. Delivery lorries were kept away from the SA1030 bondcoat and instead of having to cautiously back up to the paver, delivery drivers transferred their payloads into the Shuttle Buggy which kept material constantly supplied to the paver.

According to the CEMEX project team, the whole operation was speeded up. Up to 828t of PMB asphalt was laid in one shift – exceptional for that material, according to CEMEX – and the team was able to reduce the number of lorries on turnaround from its Washwood Heath asphalt plant in the knowledge that the Shuttle Buggy would always be well stocked to keep operations moving.

If the M6 job is enough evidence alone, the Shuttle Buggy is going to get a lot of use. It could also be joined in the UK by similar machines. Especially so if the Highways Agency sets a ride quality specification akin to those in Spain and France where offset pavers are already in common use.

For now though, CEMEX has commissioned a consultant to validate the Shuttle Buggy through a full and independent cost-benefit analysis, and moved the machine onto further projects. Lately it has been working in Cornwall where, as main contractor, CEMEX is

reconstructing 3.5km of A30 dual carriageway. Normally on such a job (with a 300mm step down onto the formation), paving would be interrupted while an empty lorry drives out and a full one backs in. With the Shuttle Buggy, work is progressing nearly non stop.

SHUTTLE BUGGY — BUILT TO LAST

The Shuttle Buggy's name belies its size. Holding up to 22t of material, it weighs in at a hefty 30t when fully laden. It was shipped over in parts for assembly in the UK from North America where such machines and longer delivery distances are more common. A hopper at the rear of the machine receives the material and a conveyor transfers it to a storage bin. From there graduated augers draw down evenly from all parts of the stockpile while moving it to the machine's delivery arm – remixing the material and restoring its homogeneity.

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