



CEMEX, Kingsmead

At its Kingsmead site, near Horton in Berkshire, where CEMEX produces aggregates to service its concrete plant and to supply the market place, new plant has increased both throughput and flexibility.

The 40 hectre Kingsmead site, owned and operated by CEMEX UK has extensive reserves of sand and gravel and has been recently redeveloped as part of its current national investment programme of over £60 million this year. A state-of-the-art concrete plant, which can produce over 120 cubic metres of ready mixed concrete per hour (enough to fill more than a double decker bus), replaces the old plants on the site and provides material for construction projects in West London, Berkshire and Surrey. The site is estimated to provide 2.5 million tonnes of sand and gravel over a 10-year period. Following two successful projects for CEMEX UK, DUO (Europe) installed the new washing and crushing plant that will allow CEMEX to not only process sand and gravel for its concrete plant but also to provide materials for external markets.

"With the current decline in the housing market, there has obviously been a decline in the ready mix concrete market. Aggregates from the quarry have been used not only internally for the concrete, but increasingly externally," says Matt Wild, south east director of aggregates.

This trend is confirmed by the Quarry Products Association, which reports that the downturn in construction activity is reflected in the 6% decline in sales of ready mixed concrete in the first half year. This product tends to be used early in the construction process and confirms that the reduction in orders for new housing, commercial and industrial construction recorded to date in 2008 is now impacting in the market.

"The CEMEX quarries and ready mixed concrete plants in this area have contributed materials to large projects such as Heathrow Terminal 5 and the M25

widening scheme, both of which are approximately 10 miles away. In this area, currently there aren't such large construction projects, but the 2012 Olympics will make a huge demand on such resources in the south east," continues Matt.

To process its aggregates CEMEX had previously been using the same static for some 25 years. It had come to the end of its useful life. When it came to choosing a supplier for the new plant, DUO already had a foot in the door as in addition to providing hire plants on a cost per tonne throughput basis at CEMEX's Stanwell site, DUO was also at the time installing plants at the company's sites at Angerstein and Northfleet.

"We looked at other plants then looked at how Angerstein and Northfleet were delivering and the relationship we had with DUO," says Matt. Having selected DUO's scheme, CEMEX went through its requirements with the company.

"We required a plant capable of achieving a throughput of up to 300,000 tonnes a year from a stone-rich dig, which this site is, and produce a 10, 20 mm and sharp washed sand product primarily for the concrete part of the business. The plant also needed the facility, if required, to make a 40 mm single size product." Matt explains.

This versatility was an important consideration for CEMEX as Matt explains. "We are primarily looking for aggregate suitable for our concrete production but we can also produce the 40 mm down crushed aggregate for landfill blanket drainage, which is called for on a regular basis in this area, and the 'all-ins' (10 mm and 20mm) for builders merchants. We supply everyone from the collect customer who wants to come in and buy a tonne of aggregate for a cash price through to the building supplies company and builders merchants and on to the big projects such as Terminal 5, which

requires 300,000 tonnes, and anything in-between."

Washing and crushing

Replacing the aged plant, DUO installed a new washing and crushing system, based on a simple modular arrangement, which meets the required specification of one sand, 10 mm, 20 mm and 40 mm, with the +40 mm -125 mm being crushed in closed circuit.

Raw material is derived from a wet dig dragline excavation. The material is put into stockpiles and allowed to drain - CEMEX extract 3-4 days ahead of processing to allow the material to drain well. A large wheeled loader picks the material up and drops it into a variable speed hopper, which then deposits it onto the main feed conveyor coming up to the plant in the yard. The variable speed hopper allows throughput to be controlled if, for example, CEMEX is making a 40 mm down then the throughput can be increased. "We can vary throughput at the excavation end so that if we are not getting a full quality material we can adjust the throughput of the plant down to cope with that."

The main feed conveyor then deposits the material onto a 24 m long electric/hydraulic powered radial conveyor, which gives CEMEX the option - depending on the current status of the plant - to either feed the material to the hopper of a Powerscreen Commander processing plant or to a 5000 tonne surge pile stockpile out into the yard.

Fitted with a man grid and a variable speed feeder the 20 tonne capacity hopper of the Commander delivers material onto an inclined conveyor which feeds a 20 x 6 double-deck rinsing screen where the over-size +20 mm material is scalped off and discharged onto a 34 m long lattice frame crusher feed conveyor.

This conveyor feeds material forward for crushing via a 10 tonne crusher surge bin. The crusher, a Pegson 1000 Automax, is surge fed via a vibrating tray feeder, with crushed material then fed onto a 24 m long surge feed conveyor. Rated at 300 tph this conveyor re-circulates crushed material back into the system.

Any underflow from the rinser is flumed off to a Powerscreen Fines Master 200 sand plant. Working for maximum sand grade flexibility, the Fines Master 200 produces a combined total of around 200 tph; comprising a single 18" hydro cyclone, a centrifugal slurry pump, a collection tank and a high-frequency 8 x 4 ft dewatering screen fitted with 500µm polyurethane mats mounted on a single carrier chassis, the machine delivers one grade of course sand via a 24 m x 800 mm wide powered radial stockpile conveyor. All silt being fed to a sump where it is pumped to a silt water lagoon.

The -20 --mm +6 mm aggregate from the rinsing screen is then sent forward via a 24 m long x 800 mm

wide inclined transfer conveyor. This conveyor feeds onto a 16 x 5 double deck dry screen.

The material from both top decks of the dry screen is fed onto a 24 m long powered radial conveyor providing a stockpile of 20 mm product. Any material from the bottom deck is fed onto a further 24 m long powered radial conveyor stockpiling a 10 mm product.

Control and Performance

Plant operation is controlled from an operator's cabin situated alongside the crusher panel and incorporates a PLC control system for automatic start up and shutdown of the plant, which includes a provision for the manual starting and stopping of the plant, out of sequence in test mode. The system also incorporates an alarm, history recording and fault diagnostic capabilities.

The DUO Equipment division through its UK dealership supplied the Powerscreen Fines Master sand plant, all screens, and Pegson cone crusher. Working alongside, the DUO Manufacturing division (LJH) designed and manufactured all the fixed conveyors including the installation of fully galvanised heavy-gauge steelwork with guarding throughout.

Increased throughput

High among the advantages CEMEX has found from using the plant is the increased throughput, which is now up to 150 tph. "If we were to do a 40 down product, we can up throughput by about 20% up to 180 tph but there is a balance between throughput and quality of product so 150 tph is the optimum throughput," says Matt.

The plant has also improved working flexibility. When set to making 20 mm, 10 mm and sharp washed sand it can be switched to making the 40 mm product simply by changing the screen modules. "We stop the production, get up on the screen decks and change the modules. Within 35 minutes we can convert the plant back to making 40 mm down," explains Matt. "We would normally make a stock of 40 mm when we get an order and when that starts to deplete then we look at making some more. It's not a product that moves on a daily basis; it can stay on site and then we can move up to 4000 tonnes in a week, but 90% of the time we are set up to make a 20 mm down and crushed plus 20."

The new system has also speeded up drying. The sand system's dewatering screen allows the sand to basically drain and be loaded out within 3-4 hours whereas the old system took a day or two to drain. It goes across a dewatering screen and comes through the plant reasonably dry as well. "We also have from the feed a radial conveyor at the end of the feed conveyor that allows us, if the plant is down, to put a stockpile in the yard. We can then feed that stock pile through the plant as a failsafe."