

Mobile

Mobile crushing and screening equipment provides flexibility and improved productivity in the pit, writes David Poggiolini.



Traditional static crushing and screening equipment may be a thing of the past, considering ongoing developments in the field of mobile crushing and screening. *Quarry SA* was invited to visit a quarry which was used as a demonstration ground by an original equipment manufacturer to prove the capabilities of mobile crushing and screening equipment. Conventionally, this quarry uses static crushing and screening equipment to produce 30 000 tpm of chip and spray, concrete stone (-6 mm, -13 mm, -19 mm, -25 mm and -37 mm) for general construction, base-course from G1 to G4 and sub-base (G5 to G7) for road construction, crusher dust, and -6 mm run-of-crusher.

The various configurations of crushers and screens during the demonstration could produce these products and exceed current production volumes, while introducing more flexibility and productivity to the pit.

A noticeable aspect of the demonstration was that there really was no need at all for dump trucks or tippers to operate on the site. Crushing and screening is undertaken close to the working face and aggregate transported over short distances to strategic stockpiles for collection by wheel loaders. This reduces operating costs significantly, including diesel burn and wear and tear on equipment and componentry. In some instances, a mobile conveyor replaced a loader completely, further reducing the negatives associated with traditional load-and-haul methodologies.

Mannetjies Venter, sales manager of Portland Quarry, where the demonstration was undertaken, believes that mobile crushing and screening is certainly the future of any quarry, noting the flexibility and productivity boost that is achievable using this gear.

machinery TAKEOVER?



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Powerscreen

- A: Four scenarios
- B: Crusher to screen
- C: Crushing train
- D: 180 tph washed



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A: Four scenarios

First in South Africa

The demonstration formed part of Powerscreen's annual World Dealer Conference. This is claimed to be the first time that the event was held in South Africa, which is considered to be a strategic market for the company considering road construction projects underway and larger ventures anticipated in the foreseeable future.

At the quarry, the Powerscreen equipment was used to process Cape Shale rock for use in asphalt and concrete production.

Four machine set-ups were demonstrated and explained by ELB Equipment's national sales manager, Heath Dickson.

The first featured the XA750S jaw with the Warrior 2400 screen. The second comprised a jaw, cone and horizontal screen series followed by a further recirculating cone and Chieftain screen. This was complemented with a demonstration of a XH320SR followed by a Chieftain and Finesmaster wash-plant washing quarry dust.



From crusher to screen

600 t an hour

The XA750S jaw was fed with a blasted Cape Shale rock. The chamber was set up with a 150 mm close side setting and the pre-screen has blank mat fitted. The crushed product is then passed on to the Warrior 2400 machine.

Meanwhile, the 2400 was configured with a 150 mm punch plate on the top deck and a 75 mm mesh on the bottom deck, giving a 150 mm+ oversize product, a 75 mm to 150 mm mid-size product and a 0 to 75 mm fines product. The throughput achieved was approximately 600 t per hour.



B: Crushing train



A: XA400S jaw
 B: 1300 Maxtrak cone
 C: H6203 horizontal screen
 D: 1000SR recirculating cone
 E: Chieftain 2100X 3 Deck incline screen

320 t of 0 – 6 mm, a 6 – 8 mm, an 8 – 11 mm and an 11 – 15 mm of finished aggregates were produced an hour.

From the jaws to the cone

The second layout comprised a XA400S jaw, a 1300 Maxtrak cone, a H6203 horizontal screen, a 1000SR recirculating cone and a mobile Chieftain 2100X three deck incline screen.

The XA400S was also fed with a blasted Cape Shale rock. It is fitted with 300 mm pre-screen mesh and the chamber was set at 125 mm allowing a sufficient feed to the 1300 Maxtrak. The chamber on the 1300 Maxtrak was set at 34 mm

supplying a crushed feed to the H6203 unit. The H6203 was configured with a 25 mm top deck and a 15mm middle deck with nothing on the bottom deck.

This produces a zero - 15 mm and a 15 – 25 mm product with a blended 25 mm plus over-size to be passed onto the 1000SR Maxtrak.

The 1000SR chamber was set at 19 mm which allows the crushed material to be passed onto the post screen of the 1000SR. The post

screen featured a 25 mm mesh fitted on the top deck allowing a crushed product to be passed onto the Chieftain 2100X 3 deck.

The Chieftain 2100X 3 deck has a 14 mm top deck, an 8mm middle deck and a 6 mm bottom deck allowing it to produce a 0 – 6 mm, a 6 – 8 mm, an 8 – 11 mm and an 11 – 15 mm of finished aggregates for asphalt production. The throughput for the day's setup was approximately 320 t per hour.

Recycled concrete

The XH320 was fed with a recycled concrete mixed product. The chamber was set at 80 mm on the upper apron and 40 mm on the lower apron. It was also fitted with two full and two half, martensitic blow bars to allow sufficient product to be fed onto a tracked 11' x 5' double deck, four bearing, screen box.

The end product was 0 – 40 mm of recycled aggregates for concrete production. The 40 mm + product was re-crushed via the on board recirculation conveyor, allowing the oversized product from the post screen to be passed back to the crushing chamber.



D: 180 tph washed

Chieftain
Finesmaster



The plant washed 11 - 15 mm, 8-11 mm and 6 - 8 mm sand, as well as 0 - 6 mm concrete sand.

David Poggiolini

A live performance

This was reportedly the first time that the Powerscreen Chieftain Rinsers and Finesmaster were demonstrated in a live application.

The Powerscreen Chieftain 1700 Rinsers three deck has an 11 mm top deck, an 8 mm middle deck with a bottom deck which is split with 3 mm on the first section and 6 mm on the second section.

This plant washed approximately 180 t per hour, creating a washed

11-15 mm, 8-11 mm and 6-8 mm with the two sand slurries (0 - 3 mm and 0 - 6 mm) being fed into the Finesmaster 120 bucket wheel. The Finesmaster 120 removed silts and slurries to produce a 0 - 3 mm building sand and a 0 - 6 mm concrete sand.

The Finesmaster comprises four key elements, namely bucket wheels, a sump and rubber lined pump, rubber lined hydro cyclones and a high frequency dewatering screen.

There has been a marked growth in

the use of mobile crushing and screening equipment over the years. However, southern African quarries are still inclined to use mobile gear to supplement the output from their fixed crushers and screens. Only time will tell whether or not African operators decide to go fully mobile, but the benefits of this approach are certainly evident. Read more about our visit to Portland Quarry in the March 2012 edition of *Quarry SA*.



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