



## CDE's M2500 sand washing plant reducing clay contamination in Cherepovets, Russia

*The M2500 from CDE is successfully processing clay contaminated material for Stroytekhservis Cherepovets at their natural sand and gravel quarry to ensure their final sand product complies with Russian standards for concrete production.*

Stroytekhservis Cherepovets is a quarry company in the west of Vologda Oblast, Russia, established in 2005 and specialising in the production, sales and transportation of sand and aggregates. The company has purchased a new M2500 washing plant from CDE which is significantly reducing clay and dust contamination and producing a range of washed sand and aggregates. The new plant was delivered by CDE in conjunction with Mining Technologies, CDE's sales partner in Russia.

Stroytekhservis Cherepovets is part of the Stroytekhservis group of companies. The organisation is rapidly developing with divisions in construction, sand and aggregate production, concrete production and equipment rental. Stroytekhservis owns three quarries in the Cherepovets region as well as crushing and screening plants in the area and a concrete production facility. The company's main focus is the supply of bulk aggregates and building materials for both clients and also in their own projects. The Stroytekhservis Group aims to expand its construction division over the next few years to provide a turnkey service for its customers by delivering a complete solution for commercial and residential projects.

Stroytekhservis Cherepovets approached CDE's Russian partner, Mining Technologies, in September 2012 and presented a natural sand and gravel material containing over 8% clay content which had to be cleaned. Stroytekhservis required a 120tph plant that would produce 4 washed and sized products; a 0-3mm building sand, a 3-5mm concrete sand, a 5-25mm aggregate and a +25mm aggregate. The raw material is 0-40mm sand and gravel. Stroytekhservis also required a water treatment system as they had limited space to accommodate settling ponds and additionally they wanted to reduce the requirement for fresh water to feed the plant.

After a thorough sieve analysis at the quarry, the equipment specified to process the material was a M2500 washing plant and an AquaCycle thickener. Mining Technologies invited representatives from Stroytekhservis to visit a nearby CDE installation in Priozersk in the Leningradsky region. This visit demonstrated how the M2500 and AquaCycle combination could be used successfully in the processing of material with clay and dust contamination. "We were impressed by the capability of the M2500 and AquaCycle to produce high quality sand and aggregates and realised how the system could be applied at our Cherepovets quarry. We

were confident that the CDE washing solution would meet our needs” explains Kalashnikov Vitaly, CEO of Stroytekhservis Cherepovets.

CDE specified a M2500 to tackle the problem of clay and dust contamination. The M2500 ensures that the clay material is being effectively processed to create 4 commercial grade sand and aggregate products. The requirements for concrete sand are defined by the Russian state standard GOST 8736-93. “It was very important that the final sand product should meet the standard specification for concrete production. The M2500 produces in specification products which comply with this standard and therefore are suitable for construction works as clay and dust particles in the final product are 0.2%” explains Vitaly Vizir, CEO Deputy for sales for Mining Technologies. The plant also includes an AquaCycle thickener which was selected for its recycling benefits as it significantly reduces the volume of fresh water required as up to 90% of the water used in the washing plant is recirculated around the plant.

## The Process

Material first enters the plant at the M14 feed hopper where a manual tipping reject grid remove the +150mm material. The M2500’s integrated feed conveyor delivers the material to the ProGrade screen. CDE Transfer Point Technology specifies that the belt width is 1000mm, which is the same width as the belt feeder. This ensures minimal wear, no spillage and maximum efficiency when material passes between the hopper and conveyor. “CDE Transfer Point Technology is evident in the entire CDE product range and is central to the design of our equipment. We are focused on reducing wear, ensuring the smooth flow of material and minimising the lifetime cost of ownership on our plants for our customers” explains Eoin Heron, Senior Sales Manager in Europe and Russia for CDE Global. Polyurethane wear pads are also fitted at this transfer point which further increases wear resistance.

From the feed conveyor, material is discharged to the Prograde P2-75 double deck rinsing screen. Prior to this a wash box fitted to the head of the feed conveyor ensures sufficient water is added to allow effective screening. The top deck removes the +25mm material which is stockpiled using one of the 9m wing conveyors. The bottom deck of the ProGrade is a split screen where the first part of the screen has very small apertures where the 0-3mm material can pass through and further down the screen the apertures increase in size to allow



‘From the feed conveyor, material is discharged to the Prograde P2-75 double deck rinsing screen.’

the 3-5mm material to pass through. The 5-25mm product travels down the screen and goes directly to the second stockpile conveyor on the M2500.

The 3-5mm material is transferred via jet pump to one half of the dewatering screen on the integrated EvoWash sand washing plant. The polyurethane screen guarantees maximum dewatering of the 3-5mm sand. Replaceable polyurethane side wall protection on the EvoWash screen minimises material on steel contact, reducing wear and increasing the working life of the machine. The 3-5mm product is stockpiled to the third M2500 conveyor with a stockpile capacity of 150m<sup>3</sup>. The dewatering screen is split in half to ensure that 2 products can be dewatered at the same time.



‘The 3-5mm material is transferred via jet pump to one half of the dewatering screen on the integrated EvoWash sand washing plant.’

Before the 0-3mm product reaches the dewatering screen it must be pumped from the bottom deck of the ProGrade to the HydroCyclone on the EvoWash. HydroCyclone technology facilitates highly accurate separation of silts and clays from the final washed sand product. The fine sand fraction is discharged via the cyclone underflow to the rubber lined feedbox which distributes the material evenly onto the second side of the dewatering screen. This maximises the screening area and ensures high efficiency dewatering. This product is then stockpiled from the fourth M2500 E4X conveyor. Meanwhile the -63micron fraction overflows the HydroCyclone and is transferred along with the waste water to the next stage of processing. This overflow is discharged at the highest point of the plant which negates the need for additional pumping.



'The AquaCycle design allows for high rate settlement of these fine particles to the bottom of the thickener tank.'

The plant has been running since July 2013 and CEO Mr Kalashnikov Vitaly is extremely happy with its performance. "The CDE washing plant has solved our problem with clay contamination. It is successfully washing off dust and clay so now the final product complies with the necessary regulations for concrete sand. In terms of our company strategy, the washing plant means we are able to provide a complete turnkey solution for our customers starting from the materials in the ground and ending with the commissioning of turnkey construction projects." Further details on the range of applications for CDE equipment across construction, mining, specialist industrial sands and environmental applications can be found at [www.cdeglobal.com](http://www.cdeglobal.com). More information on Stroytekhservis can be found at [www.nerudno.ru](http://www.nerudno.ru).



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Excess fines are passed to the AquaCycle A400 thickener complete with CDE Flocstation. The AquaCycle design allows for high rate settlement of these fine particles to the bottom of the thickener tank. The FlocStation acts as the delivery system for polyelectrolyte to the AquaCycle to facilitate settlement of sludge. Sludge settles at the bottom of the tank where a set of rakes ensure that the sludge is maintained at an even consistency before it is discharged to ponds. Clean water overflows the thickener and recycles to the AS404 water tank, a complete water storage and pumping system for the recycling of recovered water around the washing plant.