

Velde Pukk open new 300tph washing plant for construction & demolition waste recycling

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The new 300tph washing plant for construction and demolition waste was purchased by Velde Pukk in late 2014 and is the first of its kind in Norway. "We opened discussions with CDE a number of years ago as we see the huge opportunity presented by the recycling of C&D waste to high quality, high value recycled sand and aggregates with a wide range of applications" says Managing Director of Velde Pukk, Mr Egil Velde. "We visited a number of existing CDE installations and have watched very closely the technological innovations from CDE in recent years which combine to maximise material quality and minimise waste from the process."

As well as processing C&D waste received at the Sandnes quarry the new CDE plant is also processing overburden from the company's hard rock quarry operations at the same site. The CDE project was initially led by Eoin Heron, CDE Regional Director for Europe and Russia and he says that the flexibility offered by the CDE equipment was an important factor in winning the project. "We looked at the overburden for Velde and determined that we could design a plant that would allow them to not only recycle the C&D waste but also to recover material from the overburden which could subsequently be used in their integrated operations."

As well as operating the quarry in Sandnes, Velde also specialise in the production of ready mix concrete, asphalt production and laying and have their own transport fleet which you can't fail to notice on any trip around the Sandnes and Stavanger areas.

The North Sea oil industry is a big driver for the economy in this part of Norway and the short trip from Stavanger airport to the quarry in Sandnes reveals a huge amount of infrastructure development on the ground, matched only by the number of helicopters you see transporting people and parts back and forward from the oil rigs off the coast.

"We are a well established and respected name in this area and are providing material to a large number of local projects on a daily basis" explains Egil Velde. "Our investment in the first wet processing plant for C&D waste in Norway is a symbol of our success - people expect innovation from our company because of our history and we hope that our investment in the CDE plant is taken as a symbol of the potential that exists for

this highly valuable resource to be turned into high quality, high value recycled sand and aggregates."

The story of Velde as been one of continuous investment and diversification since the company was originally formed in Sandnes in 1984 by the father of the current Managing Director. "When my father started the business we were producing aggregates for road and pipe construction from the quarry in Sandnes" explains Egil Velde. "Now my father has retired and I run the business in partnership with my two brothers, Harald and Reidar."

The company has expanded significantly in the last decade, beginning with the introduction of an asphalt plant at Sandnes quarry in 2006. By 2007 they had built what they say is the largest, most modern and environmentally friendly production facilities for crushed rock processing and asphalt production in the world. This was followed in 2008 by the establishment of a contracting business for road construction and in 2009 a ready mix concrete plant was introduced to the site.

"Our business has always been about doing things the right way" says Egil Velde. "Our ambition to grow and build on the strong foundations that our father built always run in tandem with a desire to ensure that the business we build is sustainable and has minimal environmental impact. In CDE we found a company that shared this ethos and also shared our desire for this project to be much more than a cold business transaction. We want to build long term relationships with our partners built on trust and respect that will allow us to achieve our growth ambitions while maintaining a focus in our people, our customers and the world around us."

Project Delivery

This partnership approach between Velde and CDE allowed for significant efficiencies to be enjoyed during the project delivery phase. The CDE project manager on this job was Colum Bryson and he believes the level of engagement with the Velde brothers and the wider operations team in Sandnes was critical to the success of the project.

"This is one of the largest mechanical installations that CDE has ever completed and as with all projects there were some very specific challenges to overcome during the design and delivery phase" explains Colum.

"Sandnes quarry is a very busy working site so the installation and commissioning phase had to be managed with respect for the essential daily operations of the crushed rock processing plant, the ready mix concrete

plant and the asphalt production plant. Thanks to the engagement and commitment of the full team at Velde we were able to not only manage these issues but actually reduced project delivery time by 40%."

There were 55 lorries involved during the transportation phase to deliver the new washing plant to Sandnes quarry and due to limitations on space it was essential that staged deliveries were organised. It was also essential that this was done in such a way as to minimise crane hire requirements on site. "Due to space restrictions on site this project posed a number of challenges if we were to ensure that there were no additional project costs incurred" explains Colum Bryson. "We were able to achieve this as a result of the commitment that Velde demonstrated to the project from the outset. The value of getting the new plant up and running in the shortest possible time is often underestimated but not in this instance."

The Velde commitment to doing everything the right way is immediately apparent whenever you visit Sandnes quarry and see the work that has gone into the civils on which the plant is located. A concrete pad was constructed as well as a variety of concrete product bays built to facilitate the introduction of the many radial product conveyors on the plant. "The concrete pad at Sandnes quarry is an example of how all projects such as this should be accommodated" says Colum Bryson. "The long term benefits of this are huge - easier and more efficient movement of site vehicles around the site and quick, easy and safe access for essential plant inspection and maintenance."

The specification of several radial stockpile conveyors for the washed recycled sand and aggregates is another example of the Velde commitment to minimising the environmental impact of their operations. "This has the effect of significantly reducing transport movements on site bringing significant cost savings" explains Harald Velde, Operations Director at Velde. "This also eliminates unnecessary double handling of our products. In addition to the cost benefits the reduction in transport movements also reduces health and safety risks on site - safer, happier people are more productive people and this was a big factor for both us and CDE in the design of our new plant."

The Process

Feed material is first delivered to two R2500 primary screening units located side by side and with integrated apron feeders which split the feed across two separate 150tph processing lines. From the feed hopper material is sent to the R2500 primary screening unit and the +90mm material is removed via a double deck

5m x 1.5m grizzly screen. The remaining material is discharged to two horizontal feed conveyors.

The 0-90mm material then arrives at two AggMax 151 modular logwashers where a pre-screen removes all the 0-4mm material which is delivered directly to the EvoWash 201 sand washing plant. "The pre-screen is essential at this stage to ensure the efficient operation of the AggMax" explains Eoin Heron. "Not only does it ensure that the aggregate fraction is satisfactorily scrubbed but it minimises wear in the AggMax and maximises sand production."

After aggressive scrubbing in the two AggMax units the 4mm-90mm recycled aggregate is sent to a ProGrade P2-108 sizing screen. The two AggMax machines also include a trash screen at the rear which removes any lightweight and organic contamination from the recycled aggregate product. Any sand liberated during the attrition phase is also sent to the EvoWash sand washing plant and ensures maximum product yield from the C&D waste feed.

The ProGrade P2-108 sizing screen is from the new Infinity screening range from CDE which includes a patented side wall construction which removes unnecessary weight and reduces the power required to run the screen. The screen is set up to produce a 4mm-11mm, 11mm-16mm, 16mm-22mm and 22mm-90mm product all of which are stockpiled using static and radial stockpile conveyors. The EvoWash sand washing plant produces two grades of sand – a 0-2mm and a 2-4mm. The 0-2mm product is used in the asphalt production plant at Sandnes quarry while the 2-4mm product is used in the concrete plant.

Given the space restrictions on site it was essential that full water recycling and sludge management was included on the new plant for Velde Pukk. There is no option to include settling ponds at Sandnes quarry but the Velde commitment to minimising environmental impact meant that this was an essential requirement of the new plant anyway. "Not only does the plant require much less space with the full water and sludge management system but the fresh water requirement is 95% less than if we simply included settling ponds. It also results in a cleaner, safer and more productive site" explains Harald Velde.

The wastewater from the plant is first delivered to an AquaCycle A1500 thickener where it is dosed with flocculant. This forces the very fine particles of silt and clay to bind together and sink to the bottom of the tank. Meanwhile, the recycled water overflows the peripheral weir and is stored in a concrete buffer tank before being recirculated to the washing plant.

The sludge at the bottom of the AquaCycle thickener is discharged automatically at certain pressure and is sent to another concrete buffer tank which is fitted with a set of agitators to ensure a consistent sludge is delivered to the overhead beam filter press. The filter press model specified is one of the largest available and

has 169 plates each measuring 2mx2m. These plates press the sludge to remove more water before the filter cake is discharged to a bay below.

“We are currently using the filter cake – which has a dry solids content in excess of 80% - for the construction of embankments which means that we have eliminated waste from this stage of the process” explains Harald Velde. “Of the 300 tonnes per hour feed to the plant the only waste from the process is made up of the lightweight and organic contamination removed during the attrition phase.”

The future

The new CDE plant at Sandnes quarry will divert approximately 600,000 tonnes of C&D waste from landfill every year. Velde Pukk aim to develop the market for recycled material in Norway in the months and years ahead through extensive testing and use of material in their own operations.

The business case for the CDE plant was made on the basis of the cost savings that would be realised by Velde Pukk as a result of the diversion from landfill – but that is not enough for the Velde brothers who see this new plant as an opportunity to build the brand value of recycled material and increase its use not only in Norway but across Europe and the rest of the world.

“We are committed to finding more sustainable ways to meet growing demand for our mineral reserves” says Egil Velde. “Construction, demolition and excavation waste is a hugely valuable resource that can help us to extend the life of our natural reserves for future generations.”

This is a view that is shared by all three of the Velde brothers. “We wouldn’t accept a wasteful approach to the processing of virgin materials so it’s time that the same approach was taken with C&D waste” says Harald Velde.

The approach taken by Velde is a refreshing one and signals not only a change in attitude to C&D waste and the potential it offers but also that the industry is in good hands as it seeks to stay relevant, viable and secure the future innovation that will keep the sector thriving and strong.

Source: CDE