

## **DUO Equipment install a new Aggregate Washing Plant & Water & Silt Management System for N.R.S Aggregates.**

Owned and operated by N.R.S Aggregates, Saredon Hill Quarry is located at Shareshill near Wolverhampton. Following a period of six months when the site was reinstated into working order sand processing quickly followed and has been in operation for the past 3.1/2 years. With current planning permissions in place until 2032 there are also further options for extensions in the future.

Processing was originally handled by a washing plant which at the time was sufficient to cope with the sales, but with rising demand from a major customer to supply sharp sand for 3 concrete plants, with a further two coming on-line in 2017 a decision was made to upgrade the production capabilities. After researching the market industry leading, specialist washing equipment supplier DUO Equipment were duly awarded the order for a new Washing Plant and a Water and Silt Management System.

As the England and Welsh dealer for Terex Washing Systems (TWS), DUO provide cohesive solutions utilising innovative wash plants for all material and mineral washing needs. For this project, DUO chose an AggreSand™ 206 modular wash plant which is part of the outstanding range of TWS modular, mobile and static wash plants which are focused solely on providing solutions to the quarry, aggregate, mining and C&D recycling industries.

*Stephen Graham – Operations Manager, commented, “The new plant has given us the scope to increase production and improve efficiency and production of high value products to match demand. At this point we are operating at about 58% capacity and are processing 10,000 tonnes per week and selling 8,000 tonnes per week across the weighbridge.”*

*Stephen, continued, “With a mixed feed from three sources the material is mixed like a cake and blended in metre layers until 5 metres in height is achieved, this is then levelled off with a dozer with another layer added which provides a better mixture, eliminating any gaps in the grading.”*

### **The Sand & Gravel Plant:**

Capable of processing over 250tph the plant is fed by wheeled loader into a 50-ton hopper (with tipping grid) via access up a wide ramp. The width of this ramp also allows the plant to be fed by a dumper if there any problems with the loader.

Material is then fed via a 42m long inclined conveyor onto the 3-deck, 20x6 aggregate rinsing screen of the TEREX® AggreSand™ 206 modular wash plant. This is a three-deck version which utilizes individually controlled spray bars on each deck. The two-bearing screen is fitted with polyurethane modular media on all three decks with the top deck rejecting any +20mm material. This oversize material is fed via a chute onto the 32m long crusher feed conveyor which feeds a 25m<sup>3</sup> surge bin. Material is then delivered onto a vibratory feeder which automatically choke feeds the TC1000 cone crusher; crushed material is then returned back onto the screen feed conveyor for further processing.

*Stephen, further commented, "This closed-circuit arrangement has worked very well and has proved to be a very good investment; we do have a rotary crusher at our other site but I prefer the cone as its very efficient."*

The screen decks then split the required products of 10mm and 20mm which is then stockpiled via conveyors. The bottom deck is split and provides a 0-2mm which is delivered to a Finesmaster™ 120C; a static sand recovery unit on one chassis complete with centrifugal slurry pump, hydrocyclone, collection tank and a 12x5 dewatering screen. This produces a soft sand which is then stockpiled by radial conveyor.

The 0-4mm off the bottom deck is fed to the AggreSand™ 206 sand plant to produce a sharp sand. Chute-work on the AggreSand™ 206 employs the now well tested dead-box system which results in rock on rock set-up which is proving to give excellent wear properties.

The AggreSand™ 206 sand plant at Saredon consists of a high energy 14x6 dewatering screen which is capable of de-watering up to 200tph. Two 45Kw 200/150 pumps, one G4-660mm and one 500mm cyclones complete the specification to produce a clean in-specification sharp sand.

*Luke Talbot - MD at DUO, commented, "The Terex® AggreSand system is delivered pre-wired and pre-plumbed and combines aggregate washing and screening with sand processing on an easily installed modular chassis which was the ideal solution for N.R.S. It brings together tried and trusted TWS components in an innovative design that is very appealing in terms of access, serviceability and modularity. Quite simply it sets itself apart from other washing systems in the marketplace."*

*Luke, continued, "TWS have continually demonstrated their commitment to providing outstanding innovative products, customer support and expertise in the field. As their English and Welsh dealer, DUO is dedicated in providing reliable, high quality and very productive TWS equipment to meet our clients' materials and mineral washing needs that meet today's stringent specifications of clean material."*

### **Water and silt management system:**

The Water Treatment Plant at Saredon receives dirty water, from the washing plant and has two purposes. The first is to clarify and recycle the water and the second is to concentrate the sludge. This is achieved by the addition of a polymer which attracts the silt particles, forming larger, heavier ones which congeal and sink to allow both targets to be achieved. These heavier particles are known as flocculants. Delivered as a white powder the process involves two stages: mixing with a low speed agitator, and secondly by maturation that takes place in a second tank where it is dosed by a pump with a frequency variator.

The dirty water coming from the cyclone overflow is mixed with the flocculent solution prepared by the Dosafloc. An additional and final dilution of the flocculent solution through cyclonic spreaders then optimises this mixing solution in the flocculation box (fitted with baffle plates). Once prepared, the water is directed by gravity into the central feed shaft.

At this point the flocculation controller takes a sample of flocculated water from the central shaft and the settling speed is measured by the Controlfloc (a glass tube fitted with optical cells). This information is then transferred to the PLC which automatically adjusts the flow from the flocculant dosing pump (according to the settings entered during the commissioning stage) in order to optimise the flocculation efficiency and consumption. After each measure, the glass tube is automatically rinsed. Samples taken with a vacuum system avoid the use of a pump which would distort the measure by breaking the flocculants. The optic cells also determine the turbidity of the recycled water and therefore adjust the coagulant dosing accordingly.

### **Sludge Concentration and Evacuation:**

The sludge settles quickly at the bottom of the thickener where it is concentrated and gathered into the pumping cone due to the slow movement of the scraper. The sludge is then drawn by a pump which is located alongside the 14m diameter thickener tank which is sized to handle up to 40tph of silt. The sludge pumping cycles are controlled according to the measure of the resisting torque applied on the scraper which is interpreted by the PLC. This gives reliable information about the quantity and consistency of the sludge at the bottom of the thickener, and also offers a safety in case of a 'build up' inside the thickener. If an overload is detected by the inverter, the scraper is automatically fully lifted to its upper position and then progressively lowered down to dilute the sludge.

The transfer and pumping of recycled waters is achieved with the overflowing waters being discharged into the 10m diameter clarified storage tank, where the plant feed water pump delivers it back to the washing plant.

### **The technical room and static bridge:**

The whole plant is controlled from the technical room (sited on the static bridge) by the PLC; via a touch screen which displays the synoptic and allows access to the settings. The main switch and control panel are also located inside the technical room which contains the flocculent preparation, dosing unit and controller, the main switch, control panel, scraper driving unit and the fresh water box.

Recently commissioned the plant has performed efficiently providing N.R.S with much more control and flexibility over their production enabling them to satisfy the increased demand.

**ENDS**

1361 words + images

### **Further Information:**

DUO (Europe) plc  
4 Rye Hill Office Park  
Birmingham Road  
Allesley

Coventry CV5 9AB

Tel: 0845 22 22 386

E: [info@duopl.com](mailto:info@duopl.com)

W: [www.duopl.com](http://www.duopl.com)

**Press Enquiries:**

John Vincent Marketing Services Ltd

T: 07525 921714