

Silo installation

The silos are located in a separate building and are fed by conveyor belts from the gravel plant. A total of 10 silos are available with a total storage capacity of 13000 t. Each silo is equipped with dosing equipment with which material is automatically extracted according to requirements in concrete mixing plant. The sand silos are equipped with discharging aids or air cannons and drainage valves (for static dewatering of the sand). All silos also have a lateral wheel loader extraction point.

Water treatment

The complete installation has a closed water circuit. All cloudy water from the washing process is injected with flocculation aid and pumped into a static vertical clarifier. The sludge is allowed to settle and the clarified water flows over into the process water tank, which in turn supplies the water consumers in the washing process. The settled sludge is fed into a sludge buffer tank and sludge mixing tank respectively, and subsequently dewatered in a chamber filter press.

Control unit

A control system operated by several touch panels permits fully automatic operation of the plant. All sections of the plant and their respective operating status are displayed. The control unit offers a wide range of additional operational options (operating hours counter, monitoring maintenance intervals, failure memory, remote access, local / manual operation, etc.).



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Gravel processing plant «Ochsenstäfeli» –
Pumped storage power station at Limmern



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Client Kraftwerke Linth-Limmern AG, CH-8783 Linthal
 Main contractor ARGE Kraftwerk Limmern, CH-8783 Linthal
 Sub-contractor Marti Technics Ltd.
 Plant Engineering Stone & Earthworks
 Drawn up 2009/2010



Services provided by Marti Technics Ltd. Plant Engineering Stone & Earthworks

Design, planning, execution and certification of the complete processing plant for tunnel excavation material.

The plant consists of the following main components

- Mobile pre-crushing mill
- Wet classification and sand processing
- Oversized grit and surplus return to secondary crusher
- Closed water circuit with waste water treatment plant and sludge dewatering
- Building insulation and heating for operation up to -20°C at 1 900 m above sea-level
- Silo installation with automatic dose extraction unit

Technical data

Gravel processing plant

- | | |
|----------------------------|-----------------------|
| ■ Plant loading capacity | 160 t/h |
| ■ Grit processing | 55 t/h |
| ■ Water circuit | 310 m ³ /h |
| ■ Silo storage capacity | 13 000 t |
| ■ Total installed capacity | 1 800 kW |

Control system and electrical installation

- Fully automatic plant control from feeding to loading
- Automatic calculation of raw material feeding volume
- Medium voltage supply with own transformer station and feed line distribution

Plant description

Track-mounted mobile pre-crushing unit

The tunnel excavation material is delivered to the Ochsenstäfeli gravel processing plant by a conveyor belt system. The track-mounted pre-crushing unit integrated into the building is supplied with raw material by a wheel loader. The feeder channel conveys the material via a pre-separation unit to the impact crusher, which pre-crushes all material to a grit size of approx. 63 mm. An overbelt magnet protects the installation from foreign matter. The pre-crushed material is carried by conveyor belt to the downstream screening machine set to 63 mm. All material with a grit size < 63 mm is graded out; material > 63 mm is returned to the crusher.

Classification and grit processing

The material is lifted by a twin-belt conveyor. Grading starts with the first elliptical wet screening machine on whose upper deck sizes > 32 mm, on the lower deck sizes > 4 mm are removed and sand 0–4 mm passes through. The 0–4 mm sand/water mixture is collected in a pump vessel and conveyed by a solids pump to the cyclone. The cyclone underflow/sand discharge is subsequently drained by a dewatering screening machine.

Components > 32 mm are conveyed directly to the secondary crushers, where grit sizes 4–32 mm are graded in two screening machines located one behind the other. The 22–32 mm and 16–22 mm components are graded on the first machine, 8–16 mm and 4–8 mm components on the second machine. The 4–8 mm components are post-graded and dewatered on the lowest level. All components including sand are conveyed to the silo after grading.

Oversized grit and surplus return to secondary crusher

Material sizes > 32 mm are fed directly to the secondary crusher. In addition, all individual components of 4–32 mm can be directed to the secondary crusher via material switch plates.

Particles > 16 mm are fed to a reversible horizontal impact crusher, where sand and grit sizes > 4 mm are produced by setting the corresponding slit width. Grit sizes from 4–16 mm are then crushed in a vertical impact crusher which can be set by frequency control, mainly 0–4 mm.

With the two crushers and their respective settings the returned material can be broken down to the desired grit sizes. The quantity of all components to be produced can thus be optimally adjusted to current needs.