References

In place in a couple of days

Uponor involvement

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The waste water channel for the pulp line of the mill, which was renovated in 2017, was commissioned in the 1960s. Now there were fear that it would collapse. The new solution was Weholite.
Weholite pipes made of polypropylene met – and even surpassed – strict requirements in the renovation of a waste water channel at the Stora Enso Oulu mill in Northern Finland. Timed for a maintenance stop of nine days, the installation proceeded quickly and was finished well before the deadline.

Project Facts:

Location
Oulu, Finland

Completion
2017

Building Type
Industrial buildings

Project Type
Renovation

Founded in 1937 in Oulu, the Stora Enso integrated pulp and paper mill produces 360,000 tonnes of long fibre pulp and 1,125,000 tonnes of coated fine paper each year. 60 percent of pulp production from the mill, which has around 600 employees, is exported and 40 percent is fed into the factory's own paper machines.

The waste water channel for the pulp line of the mill, which was renovated in 2017, was commissioned in the 1960s. Over the years, the channel had deteriorated to the point that there were fears that it would collapse.

"The channel's condition was examined during a maintenance stoppage two years ago. At the time, it was decided that the

channel should be renovated as soon as possible," says Project Manager Juha Parpala from Efora Oy.

Efora, which is owned by Stora Enso, specialises in industry maintenance and other services that ensure that factories run uninterruptedly.

''At Stora Enso's plants, we are responsible for preventative maintenance, as well as maintenance purchases and investments.'' Parpala says that the pipe inspections and repair and renovation work must be planned carefully and timed for the 7–10 day-long maintenance stoppages that occur every 1.5 years or so.

''Because all water needed for the Nuottasaari factory complex is treated at the Oulu pulp factory, very extensive arrangements are needed for repair and renovation work related to the water treatment process. This may only be possible every 5–10 years,'' says Parpala. ''This waste water channel renovation also required the shutdown of the entire factory complex, because waste water from the water treatment process flows into the channel. Other chemical industry plants in the area had to be shut down, until we were able to arrange the bypass pumping of the sludge from the clean water production process.''

The pipes must withstand chemicals and high temperatures

An important criteria in choosing the polypropylene Weholite pipes was their tolerance of high temperatures and almost all chemicals. Plastic also involves no risk of corrosion.

''The temperature of the waste water flowing into the channel is +60–70°C and it includes traces of chlorine dioxide, which is a strong, corrosive agent used in bleaching,'' says Parpala.

Kalle Kärnä, Operations Manager at the Oulu Stora Enso factory, points out that Weholite pipes have previously been installed at Stora Enso's factory in Imatra in eastern Finland.

''This decision was also substantially affected by the good experiences we have had with Weholite.''

Kärnä states that concrete pipes were considered for the renovation, but were thought to be too labour intensive and slow. ''Time was of the essence, because the contract absolutely had to be finished during the stoppage – within nine days in this case.''

Preparatory work during the first week

The channel to be renovated was over 80 metres long, half of which was underground, outside, while half lay under the floor of the factory building.

''We decided to remould the end section of the channel in concrete, because with so many branches and other structures, there would have been no other way to complete the work in practice,'' Juha Parpala states.

A heavy, 30 centimetre thick concrete cover for the outside channel needed to be demolished before the renovation began. The ground was dug up and the cover was opened for a distance of around 50 metres.

Uponor Infra began the preparatory work the week before the renovation. The Weholite pipes, which had an interior diameter of 1,200 millimetres, were delivered to the worksite in 21 metre-long sections.

''During the first week, we prepared connections and welded two pipes together, so that the first 42-metre long pipe going under the building would be ready at the beginning of the maintenance stop,'' says Foreman Veli-Matti Hakala from Uponor Infra.

Ready well before the deadline

Work on installing the pipes could begin about midday on the Tuesday of the maintenance stop week, by which time a bypass

pump for sludge from clean water production had been installed. In addition, the gravel and sludge layer that had gathered on the bottom of the channel had to be removed before the new pipes were installed. The renovation was begun by feeding the first pipe into the channel under the factory building.

‘‘When the pipe fed under the building was in place, an excavator was used to insert the other 42-metre long pipe into the channel outside the building.’’

Branches were only made on the outside section of the pipeline, because it was impossible to open the factory floor due to the production machinery.

‘‘Several side branches made of polypropylene in diameters of 110, 315, and 500 millimetres were added to the outside pipeline,’’ Hakala says.

Both Parpala and Kärnä were surprised by the speed of the installation. The original deadline for completing the work was Saturday evening, but the job went exceptionally well and was finished on Wednesday afternoon.

‘‘The installation went much faster than what we had expected,’’ Parpala and Kärnä state.

‘‘Weholite is light and easy to handle, as the installation time shows,’’ Hakala notes. The renovated waste water channel was taken into service at the end of May. Once the land had been refilled, the concrete cover was reinstalled to protect the new pipes. New asphalt had been laid in the yard by the end of June.

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