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**European Association for
Ductile Iron Pipe Systems**

Fachgemeinschaft Guss-Rohrsysteme

NEWSLETTER

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Dear Readers,

Damaged and leaky sewage networks can cause waste water to exfiltrate into the soil, thus polluting both soil and groundwater. But the infiltration of groundwater into sewage systems lacking tightness is also a reason for action on the part of the network operator. This proportion of the waste water, identified as extraneous water, reduces the purification capacity of sewage treatment plants and places unnecessary hydraulic loads on the sewer system. The replacement of a main collector with installation depths of up to 7 m in the Austrian resort of Ischgl with ductile cast iron pipe systems which keep out this extraneous water is a guarantee for long-term, secure network operation.



Landscape conservation and cost reduction were the reasons for using the pipe bursting technique for the installation of a supply pipeline. The cement mortar coating of ductile iron pipes protects them against damage during the process of pulling in with their restrained joints.

However, the laying of pipelines using the open trench technique is still the most widely used replacement method. As was the case with the replacement of a connection pipeline for drinking water in the Swiss Canton of Jura.

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Sincerely yours

Christoph Bennerscheidt

Always topically, always informs

The online newsletter informs deciders and technical experts about cutting-edge pipeline projects in Europe as well as about the diverse activities of EADIPS®/FGR®.

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Ischgl:

Structural and hydraulic renovation of the sewage system

Ischgl is booming – and has been so since the opening of the Silvretta cableway back in 1963 which, at the time, was the longest cable car system in Austria. After just four years, 100,000 winter tourists were turning up. The growth spiral of tourism rose rapidly in Ischgl. By 1976 the community had already achieved the highest capacity of all winter sports regions in Austria. Currently there are close to 10,500 guest beds – almost 7 to each of the 1,539 local residents – occupied on a hundred days in the winter season from October to the beginning of May. So that Ischgl can remain one of the most popular winter holiday destinations in the Tyrol in future, the local infrastructure also needs further development alongside the development in tourism. This also includes the sewer system.



The route taken by the pipeline on the outskirts of Ischgl

A sewage system in need of hydraulic and structural renovation

For a long time now and certainly since the record flood levels of 2005, it has been known that the sewage system belonging to the municipality and the wastewater association of Oberpaznaun was defective from the stormwater overflow basins at Versahl to the district of Schmittaboden. In past years, whenever there was heavy rainfall, hydraulic capacity was being exceeded, triggered in part by the increased building activity in Ischgl and the associated increase in the sealing of surfaces. Meanwhile the partially desolate condition of individual sections was leading to a reduction in hydraulic capacity. Between the years 1978 and 2013, the degree of surface sealing and the available catchment areas had changed and a new approach to land use planning had come into being. Therefore in 2013 the community of Ischgl decided to recalculate the hydraulic situation of the entire sewage network and, based on the results of this, carry out a structural and hydraulic renovation of the network.

A two-stage renewal

For financial reasons, the community decided first of all to renovate the sewer system from Schmittaboden to the Versahler Bridge in an initial development stage. The communal collector from the hamlet of Schmittaboden to the stormwater overflow basins at Versahl, which is approximately 1,600 m long, has some major structural defects. Over a length of about 400 m, the sewer was laid very deep, in places with a manhole depth of as much as 7 m. The bottom of the sewage pipe was worn through and the manholes had numerous fist-sized holes in them and

were leaking. Extraneous water was penetrating, which was contributing to an additional hydraulic loading of the combined sewer. The clinker bricks in the bottom of the manholes had broken up and been washed away in places. What is more, in this section of the Ischgl local drainage system there were still two stormwater overflow systems in existence which were no longer up to standard and have been adapted according to water rights legislation. The engineering company Ingenieurbüro Walch & Plangger were commissioned for planning and supervising the renovation and construction work.

Replacing deeply laid pipes in the groundwater

The extensive renovation project included the replacement of around 1,211 m of combined sewers with pipes in the diameter range from DN 250 to DN 1000. The project was located almost entirely in an Alpine region. This alone produced some high requirements for the piping system to be selected. Added to this was the position of the pipes at a depth of up to 7 m with groundwater all around. Therefore, in ductile cast iron pipes to EN 598 from TRM (Tiroler Rohre GmbH) were used over a length of 800 m to prevent infiltration.



Backfilling the trench after installation of the manholes and the pipes with protection against extraneous water.



Installation of the ductile iron pipes in an area exposed to groundwater.

Waste water pipes to EN 598 are tight against extraneous water

Evidence of the tightness of push-in joints of pipes to EN 598 against infiltrating groundwater (extraneous water) has already been provided in the context of the obligatory performance tests requested by the standard. Push-in joints with a maximum annulus are selected and then tested in two different ways as regards their tightness against infiltration. The joints are tested firstly with a positive hydrostatic external pressure of 2 bar (20 metre head of water) and then with a negative internal pressure (vacuum testing) of 0.9 bar, in each case over a period of 2 hours. This ensures that no groundwater can penetrate through the push-in joints of ductile iron pipes even under extreme conditions.

Burst lining technique

1,900 m of ductile iron pipes installed

The water supply association for the city and district of Offenbach (ZWO) supplies a total of 14 towns and communities with all or part of their water requirements from six of its own waterworks. The association operates long-distance supply pipelines for distributing the water. Because of numerous points of defects on one section of a supply pipeline of DN 200 asbestos cement pipes, the stretch between Mainhausen and Zellhausen was replaced. DN 200 ductile iron pipes from Duktus (Wetzlar) GmbH & Co. KG with cement mortar coating to EN 15542 and restrained socket joints were used.

The pipeline lies in a landscape conservation area. Because of this, a large part of the pipeline was installed using the trenchless burst lining technique. In addition, this also meant a cost saving of around 50% as compared with the open trench method. With trenchless pipe installation, the external protection of ductile iron pipes is exposed to a variety of mechanical stresses from the outside. In order to avoid damage here, the use of coatings with a high resistance to mechanical stresses is recommended. This is particularly applicable to pipes which are installed with the burst lining technique as the burst fragments of the old pipe remain in the soil and can come into contact with the new pipe during the pulling-in process. The cement mortar coating used here provides the pipes with the ideal protection against mechanical damage.

Altogether, a section of approx. 2,000 m was replaced, of which 1,900 m was done with the burst lining technique. The longest pipe run replaced in one go consisted of 28 pipes and was 168 m long. The machine used for this, from Diringer & Scheidel Bauunternehmung GmbH & Co. KG, had a maximum pulling force of 80 t.

Even though the use of the burst lining process as per data sheet GW 323 is a very well tried and tested technique and has been described many times over, specialists do not miss an opportunity of explaining the stages involved in the installation and pulling-in process for restrained ductile iron pipes as it happens.



Bursting head with a DN 200 ductile iron pipe attached during the pulling-in process.



Machine with traction rods in a target pit.



The installation of restrained ductile iron pipes and the burst lining technique is explained pit-side to an interested public.

Swiss Canton of Jura:

Renewal of the drinking water supply in Val Terbi

In the Swiss Canton of Jura, to the east of the Canton's capital of Delémont, a merging of municipalities on 1st January 2013 joined the three villages of Vermes, Vicques and Montsevelier to become the political municipality of Val Terbi. It was originally planned that additional villages should be part of the new municipality, but in a referendum in 2012 the communities of Courroux, Courchapoix, Corban and Mervelier rejected the idea of joining.

But before this, in 2011 and after many years of preparatory work by the municipalities of Corban, Courchapoix, Mervelier, Montsevelier and Vicques, the SEVT (Syndicat des Eaux Val Terbi) water syndicate of Val Terbi was established in order to achieve an organised plan of renewal for the long-term and sustainable operation of the regional water supply.

In autumn 2016, extensive construction work was undertaken for replacing the ageing drinking water supply network for the municipalities belonging to the SEVT. The centrepieces of the renovation work are the new connecting pipelines between the villages of Mervelier and Vicques, with the following construction stages:

- the transport pipeline from the "Combe des As" pumping station in Mervelier to the "La Doux" reservoir between Mervelier and Montsevelier
- the transport pipeline from the "La Doux" reservoir, through Corban and Courchapoix and on to the reservoir at Vicques



Transport pipeline between the villages of Mervelier and Vicques during installation work

Because of the superior economically, ecologically and technically sustainable characteristics of ductile iron pipe systems, the client – SEVT – decided in favour of Swiss vonRoll ECOPUR full-protection pipes in ductile cast iron for the renewal of its drinking water supply. The ECOPUR pipes, produced in accordance with EN 545, are integrally coated, inside and out, with polyurethane (PUR). The vonRoll ECOFIT fittings used have an epoxy coating to GSK/RAL-GZ 662. All the push-in joints in the piping system were secured with the restrained vonRoll HYDROTIGHT thrust resistance system.

For the improvement of the drinking water infrastructure in the participating villages, additional renovation projects are already in progress or due to start shortly. The official inauguration ceremonies for the new drinking water supply will take place at the beginning of September 2017.