

Rehabilitation



Rehabilitation of Pumping manhole

Pumping manholes are often subjected to a height erosion. **The PREDL® Manhole lining solution** is also perfectly adapted in this context. Pumping manholes up to a diameter of DN 2400 belonging to a restaurant sewage treatment plant have been completely rehabilitated.



Rehabilitation of non-standard manholes



Non-standard manholes can also be rehabilitated. Here for example square manholes have been rehabilitated.



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Manholes are continuously subjected to corrosion due to the sewage water and its permanent action of the products in decomposition. Aggressive substances do not only leave their traces in the channel area but also destroy other concrete elements such as rings and cover slabs. Not only old manholes are concerned by this but also relative recent manholes can need rehabilitation due to some unlucky circumstances.



Many rehabilitation systems have established themselves these last decades in the pipe sector whereas as the quality of the offer for the manhole rehabilitation is not as strong. PREDL® has been following for more than 10 years a strategy for protecting the complete manhole on a reliable and durable base. PREDL® uses materials which have proven their efficiency for many decades in the manhole base-liner sector : polypropylene (PP) and glass fiber reinforced plastic (GFRP). Both materials have been tested adequately on long lasting sewage water resistance during their certification and their reliability has been proven through the 1,5 million sold manhole base-liners.

In the meantime PREDL® developed different manhole rehabilitation systems which are carried out by our staff as well as in cooperation with other companies :



The latest rehabilitation system from PREDL® uses the original channel adapted PREDL®-manhole base-liner which is fitted on the channel and benching area. The vertical part of the manhole is covered with a PP liner which is welded together and makes the rehabilitated manhole completely gas tight. The space between the PP liner and the old manhole ring is filled in with a shrinking compensated mortar which fills in the smallest gaps and dries without creating any cracks. The bounding bridges on the manhole base-liner as well as the studs on the PP liner provide a perfect connection between the polypropylene and the manhole structure. The manhole inside diameter is reduced of only approximately 100 mm.



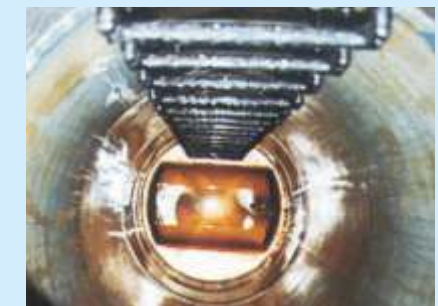
The cover-slab (or cone) is also lined with PP in order to assure a continuous and durable air tightness to the rehabilitated manhole which will have a live time equal to a newly built manhole.



A particular advantage of this system is the flexibility of the polypropylene liner which allows the rehabilitation work even when the cover slab or cone can not be removed.



Parallel to this system, the classical PREDL® manhole lining is still available for the manhole rehabilitation. Instead of the PP liner, a GFRP in-liner is used and fitted on a manhole base-liner. The existing manhole structure is also lined to the desired height and the joints are laminated in order to assure a complete water and air tightness. The gap between the manhole ring and the GFRP is also filled with liquid mortar.



Conclusion : Both rehabilitation solutions can be performed in a relative short time. Using PREDL® PP liners for the manhole ring allows the rehabilitation of open manholes as well as the rehabilitation of manholes “through the cover-slab or cone”. The sewer can be put back in use shortly after finishing the rehabilitation work. The old manhole wall is durably protected against the sewage with the joint free PP / GFRP liner.