# Manhole rehabilitation through the cone

# System – PREDL FLEXLINER / FLEXKONUS in combination with PREDL PP-CORPROTECT lining

# Product specification file: Sample

**Product specification**

**------------------------------------------------------------------------------------------------------------------------------------------------Pos. Product specification Quantity / unit Price** **1. Manhole rehabilitation System PREDL**

 **– FLEXLINER with PP-lining**

* 1. **Measurement of the manhole**

**1.1.10** The measurement by means of laser scanning (e.g. company FARO or equivalent)

in cleaned manholes.

The manhole must be secured during the measurement according tot he road traffic regulations and the channel must be filled half way maximum during the scanning process.

The water retention and the road traffic safety are remunerated separately.

The obtained data must be transferred to an inventory drawing and handed over as a rehabilitation proposal / 3 D representation to the client before the execution.

Quantity \_

*Note for the construction process :*

*1.2.10 Traffic management if necessary*

*1.2.20 Wastewater management / Wastewater control according to water management concept.*

**1.3. Rehabilitation**

**1.3.10.**  Preparatory work for the installation of the rehabilitation base.

Demolition of the existing manhole base made out of .......and benching (berm)

The existing manhole sole needs to be taken out at least 40 to 50 mm below the sole and the benching at least 100 mm below the pipe crown.

Subsequently, a clean and load-bearing substrate fort he rehabilitation system must be provided according to the manufacturer’s specifications.

The resulting material must be disposed of properly. The disposal costs must be borne by the contractor.

Quantity \_

**1.3.20.** *Note for the construction process:* Removal oft he climbing technology if necessary.

Quantity \_

**1.3.30** The complete manhole is to be cleaned by means of high water pressure (min. 230 bar) until a clean and load-bearing substrate fort he chosen rehabilitation system / mortar system has been created according tot he manufacturer’s specifications.

 The resulting material must be disposed of properly. The disposal costs and the supply for the required drinking water must be borne by the contractor.

Quantity \_

*Note tot he planner: If necessary, the manhole must be sealed against strongly pressing groundwater. The procedure shall be determined in advance.*

**1.3.40** PREDL FLEXLINER – Rehabilitation manhole base-liner (or equivalent) Diameter ........

 Made of water-resistant and flexible plastic (polyurea) supplied to scanning measurement.

Channel diameter ...........; incl. angle; incl. 100 mm slope in the main channel, incl. asymmetrical offset main channel, rehabilitation base-liner with bonding bridges anchored on the back, sanded and non-slip benching and polystyrene support core.

The FLEXLINER is flexible and can be inserted in the manhole non-destructively through the access opening diameter 625 mm.

The costs for the disposal of the polystyrene core must be taken into account

Pipe connectors are to be supplied with transition strips for connection with duroplast pipe materials or thermoplastic pipe materials and can be selected by the client / site supervisor.

The rehabilitation manhole base-liner has an edging of about 80 to 100 mm with incorporated transition strip for laminating a further duroplast lining.

Manufacturer’s indications:

Indications of the product:

Quantity \_

**1.3.50** Allowance in the rehabilitation base-liner (FLEXLINER or equivalent) for rectangular base- liners

Length……… x Width …….

Quantity \_

**1.3.60** Side inlet as an allowance in the rehabilitation base-liner (FLEXLINER or equivalent)

Side inlet Diameter ".............", incl. Asymmetrically offset and with a height difference up to 300 mm above the pipe crown.

Quantity \_

**1.3.70** Slope in the main channel above 100 mm / 200 mm / 300 mm / 400 mm as an allowance in the rehabilitation base-liner (FLEXLINER or equivalent).

Quantity \_

**1.3.80** Reinforced pipe connector fort he subsequent installation of stainless steel sleeve (e.g. Quick Lock or equivalent) as an allowance in the rehabilitation manhole base-liner (FLEXLINER or equivalent).

Quantity \_

**1.3.90** The supply of mounting connectors PREDL – FLEXCONNECTOR as an allowance in the rehabilitation manhole base-liner with loose V4A stainless steel sleeve diameter: … .

The setting of V4A stainless steel sleeves is to be included in the position installation of as an allowance in the rehabilitation manhole base-liner.

Quantity \_

**1.3.100** Supply and installation of the delivered rehabilitation manhole base-liner with an adapted potting mortar, according tot he manufacturers specifications (e.g. P&T Topolit Fix Super).

There are approx. ….. Kg of potting mortar per rehabilitation manhole base-liner to be taken in account.

 The potting mortar must have the following characteristics:

- flowable

- self-leveling

- plastic modified

- wastewater resistant

- early solid, acid and alkali resistant short term ph2-12

- impermeable to water

- can be processed from a component temperature of 1° C

- compressive strength approx. ≥9N/mm² after 30 minutes

The manhole sole must be cleaned and kept free of waste before the installation.

(The cleaning and the wastewater management are remunerated separately).

The rehabilitation manhole base-liner is folded up damage-free and unfolded to its original size in the manhole.

The installation must be carried out according to the manufacturers installation instructions

The commissioning of the manhole base-liner is after approx. 1 hour curing time of the mortar system.

The costs of the required skilled workers and the equipment must be taken in account.

Quantity \_

**1.3.110** Excess quantities of potting mortar must be proven mathematically, by delivery note and must the client / site supervisor must be informed.

Quantity \_

*Lining*

**1.3.120** PREDL CORPROTECT – manhole ring liner (or equivalent) Diameter ........ made of wastewater-resistant plastic with 3 mm material thickness (PP) supplied to scanning measurement.

Manhole ring liner with bonding bridges anchored on the back, with approx. 400 anchor-studs per m².

The Manhole ring liner is flexible and can be inserted into the manhole non-destructively through the manhole access hole diameter 625 mm.

The polystyrene support / support core is reusable. In the event of damage or contamination, the costs for the disposal of the polystyrene support / support core must be taken in account.

Manufacturer’s indications:

Indications of the product:

 Lineal meter \_

**1.3.130** Supply and installation of the delivered manhole ring liner with an adapted potting mortar, according tot he manufacturers specifications (e.g. P&T Topolit Fix Super.

There are approx. ….. Kg of potting mortar per rehabilitation manhole base-liner to be taken in account.

 The potting mortar must have the following characteristics:

- flowable

- self-leveling

- plastic modified

- wastewater resistant

- early solid, acid and alkali resistant short term ph2-12

- impermeable to water

- can be processed from a component temperature of 1° C

- compressive strength approx. ≥9N/mm² after 30 minutes

The manhole wall must be cleaned and kept free of waste before the installation.

(The cleaning and the wastewater management are remunerated separately).

The manhole ring liner is folded up damage-free and unfolded to its original size in the manhole.

The installation must be carried out according to the manufacturers installation instructions

The commissioning of the lining is after approx. 1 hour curing time of the mortar system.

The costs of the required skilled workers and the equipment must be taken in account.

 Lineal meter \_

**1.3.140** PREDL FLEXKONUS - Rehabilitation manhole cone (or equivalent) Diameter ........

 Made of water-resistant and flexible plastic (polyurea) supplied to scanning measurement.

Rehabilitation cone with bonding bridges anchored on the back / sanded and polystyrene support core.

The FLEXKONUS is flexible and can be inserted into the manhole non-destructively through the manhole access hole diameter 625 mm.

The costs for the disposal of the polystyrene core must be taken in account.

The rehabilitation cone has a transition strip for connecting to a further duroplast pipe material or to thermoplastic lining.

Manufacturer’s indications:

Indications of the product:

Quantity \_

**1.3.150** Supply and installation of the delivered FLEXKONUS with an adapted potting mortar, according tot he manufacturers specifications (e.g. P&T Topolit Fix Super.

There are approx. ….. Kg of potting mortar per rehabilitation manhole base-liner to be taken in account.

 The potting mortar must have the following characteristics:

- flowable

- self-leveling

- plastic modified

- wastewater resistant

- early solid, acid and alkali resistant short term ph2-12

- impermeable to water

- can be processed from a component temperature of 1° C

- compressive strength approx. ≥9N/mm² after 30 minutes

The manhole wall must be cleaned and kept free of waste before the installation.

(The cleaning and the wastewater management are remunerated separately).

The rehabilitation cone is folded up damage-free and unfolded to its original size in the manhole.

The installation must be carried out according to the manufacturers installation instructions

The commissioning of the lining is after approx. 1 hour curing time of the mortar system.

The costs of the required skilled workers and the equipment must be taken in account.

 Quantity \_

**1.3.110** Excess quantities of potting mortar for the manhole ring lining / FLEXKONUS must be proven mathematically, by delivery note and the client / site supervisor must be informed.

Quantity \_