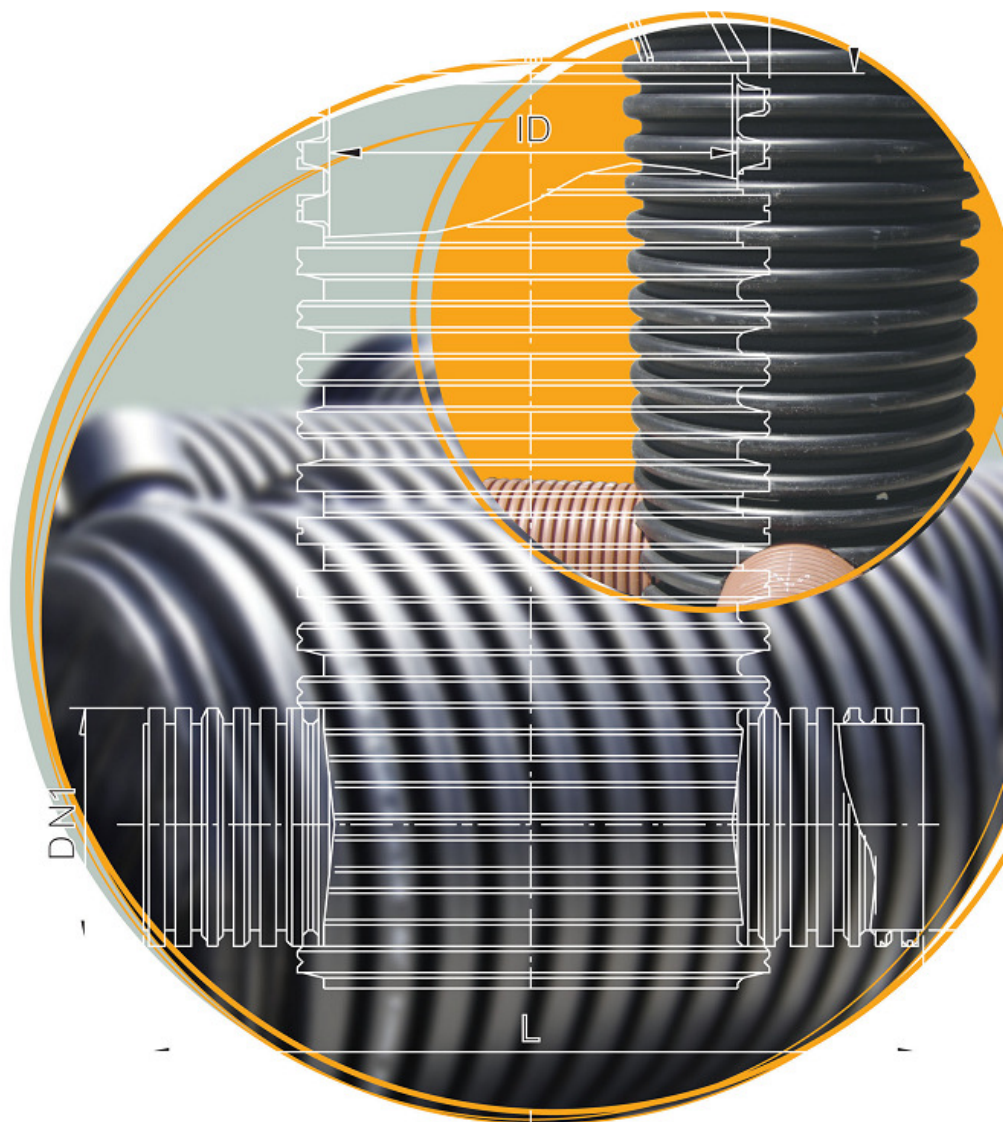




# PEHD and PP manholes and inspection chambers INSTALLATION GUIDELINES





# PEHD and PP manholes and inspection chambers

## INSTALLATION GUIDELINES

### Transportation

The loading, transportation and unloading of manholes must be done carefully with suitable tools (fork-lift or a crane with cushioned slings) in order to avoid damages of external and internal manhole surface. Metal chains and cables must be avoided. Do not unload by dumping, or throwing and do not drag it over the ground or sharp objects

### Storage

Manholes and gullies can be stored outdoors in all weather conditions. However, at longer storage it is recommended to protect from direct sunlight (UV radiation) by covering or placing under the eaves.

Products should be protected from direct sources of heat, and PP TERAKAN manholes from contact with solvents, mineral oils, wood coatings, etc.

### Installation

Functionality and durability of KEMOPLAST manholes in generally depend on proper installation procedure. Proper excavation and preparation of the trench, proper alignment, uniform support and compaction of embedment materials, proper connection and backfill are the key factors assuring long-term efficiency of the system according to the requirements.

All construction must be done in accordance with **EN 1610:1997 Construction and testing of drains and sewers**





## PEHD and PP manholes and inspection chambers

# INSTALLATION GUIDELINES

Before laying the pipeline, trenches must be prepared. Trench width for manholes must be at least 30cm greater than the manhole diameter and 15cm higher than the overall manhole height.

Uniformity of support and proper alignment of the manhole require a trench bottom of stable soil and free of sharp rocks.. The bedding consists of compacted sand or small-grained material, spread evenly and compacted uniformly. The bedding should be at least 10cm thick, made of gravel, coarse sand or crushed rock (Class I material) and compacted to a minimum 90% standard Proctor. Due to the impact of groundwater can lead to leaching of the bedding and should not be used fine and medium-coarse sand or similar material.

It can be done and concrete base, at least 10 cm thick concrete class C12/15 (MB 15). This layer is installed before installing the manhole

After the manhole is placed on the bedding, it must be properly aligned.

Manhole and pipes are connected by couplers or bell joints with sealing rings depending on the type of sewer pipes. Connection of manholes and pipes can be done manually using the special tools or a lever with a board or wood block in order to protect the surface of the pipe.

In order to get the required manhole height, easy height adjustment is possible directly at the construction site. Shortening must be performed using a fine-toothed saw (manual or electrical). The cut must be straight. The cut is done only through a corrugation valley (the manhole with flat top) or through the flat part of cone top max 10cm (manhole with cone top).

After connecting the manhole and the pipeline, the backfilling is done. It is important to ensure that non-cohesive materials are used for backfilling. The maximum particle size of rounded gravel material must not be larger than 32mm and 16mm if broken material is used. The backfilling material must meet the requirements of EN 1610, Section 5.3.

According to EN 1610, Table 1, the backfilling width at the side of the manhole for manhole DN 500 and 600mm must be at least 35cm at any point, for manhole DN 800 and 1000mm must be at least 40cm. When installing the manholes in groundwater, for lift retention reasons a backfilling width of at least 50cm is to be maintained all around.

The area of the pipe connection to the manhole has to be carefully under-packed e.g. with a narrow hand stamper. The backfilling material is to be inserted carefully and in layers 20-40cm layer thickness and compacted with a medium vibrating stamper (approx. 50kg) in order to avoid manhole deformation.

The number of required compacting passes per layer dependent on backfilling material, dumping weight and compacting device are to be taken from EN 1046, table 6. Minimum degree of compaction must be 95% standard Proctor on the green area, 98-100% standard Proctor on a roadway or in areas subjected to heavy loads (traffic area) or places with groundwater.

The final backfilling is done with the material excavated for trench preparation, with prior removing of sharp stones or cobbles that might damage the manhole. The final backfilling must satisfy loading, pavement and other requirements in addition to those of the manhole



## PEHD and PP manholes and inspection chambers

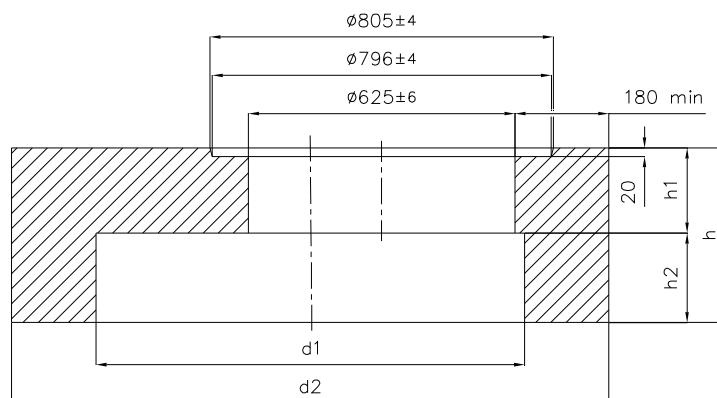
# INSTALLATION GUIDELINES

Static and dynamic loads are not transferred directly on the manhole, but through the final reinforced concrete plate (**RC plate**) on the compacted soil around the manhole. RC plate is a concrete relieved ring with integrated channel-cover of cast iron, made of concrete C30/37, reinforced with steel B500B, carrying capacity 400 kN.

It is necessary that after compaction the level of the upper bearable layer is max (h<sub>2</sub>-50) mm below the level of the manhole with a flat end or level of tapered tubular element of the manhole with cone top, since RC plate must not overlap on the manhole. This means that the distance between the top of PE or PP manhole and RC plate is at least 50mm.

**RC plate** is made as reinforced concrete plate with eccentric hole for the manholes DN 600, DN 800 and DN 1000mm and with centric hole for the manholes DN 500mm in accordance with DIN 4034-1. On the RC plate is set channel-cover of cast iron with carrying capacity depending to the traffic load (50, 150, 250 and 400 kN). It is recommended to set RC plate and cover immediately after installation of the manhole and compaction of materials to prevent intrusion of foreign objects that could damage the manhole or pipeline.

**WARNING:** Until completion of installation, machinery must not come closer than 1,5m to the manhole.



Dimensions of the RC plate for the manhole  
MAPIKAN

	Nominal diameter of the manhole DN (mm)			
	500	600	800	1000
	Diameter of the manhole OD/ID (mm)			
	630/535	800/678	1000/851	1200/1030
h	370	390	410	430
h <sub>1</sub>	200	200	200	200
h <sub>2</sub>	170	190	210	230
d <sub>1</sub>	632	805	1005	1208
d <sub>2</sub>	1030	1200	1400	1600

Dimensions of the RC plate for the manhole  
TERAKAN

	Nominal diameter of the manhole DN (mm)		
	600	800	1000
	Diameter of the manhole OD/ID (mm)		
	695/612	928/816	1168/1026
h	390	410	430
h <sub>1</sub>	200	200	200
h <sub>2</sub>	190	210	230
d <sub>1</sub>	700	933	1176
d <sub>2</sub>	1100	1350	1580

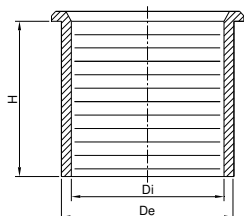


## PEHD and PP manholes and inspection chambers

# INSTALLATION GUIDELINES

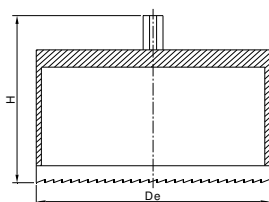
**PE or PP gullies** are installed with given dimension from schedule of the project, in a prepared excavation given depth and a bedding with compaction of soil  $\geq 95$  standard Proctor or on the concrete class C12/15 (MB 15). Connection to the manhole or directly to the sewer pipe is

performed by coupling pipes 110, 160 or 200mm or by using a specially designed rubber inlet gasket. Drilling hole in the body of the manhole is performed by a special tool (drilling crown) at the construction site ("in situ").



DN/OD	Connection DN 110			Connection DN 160			Connection DN 200		
	Di	De	H	Di	De	H	Di	De	H
315			82						
400			82			84			85
500			82			84			85
630	110	122	82	160	172	84	200	213	85
800			82			84			85
1000			82			84			85
1200			82			84			85

Specially designed rubber inlet gasket for connection to the manhole



DN/OD	De	H
110	120	160
160	171	220
200	211	180

Drilling crown for drilling hole on the manhole

Dimensions of the gully are given by project and must be such size that allows installation of the sewage grating size 400x400 mm.

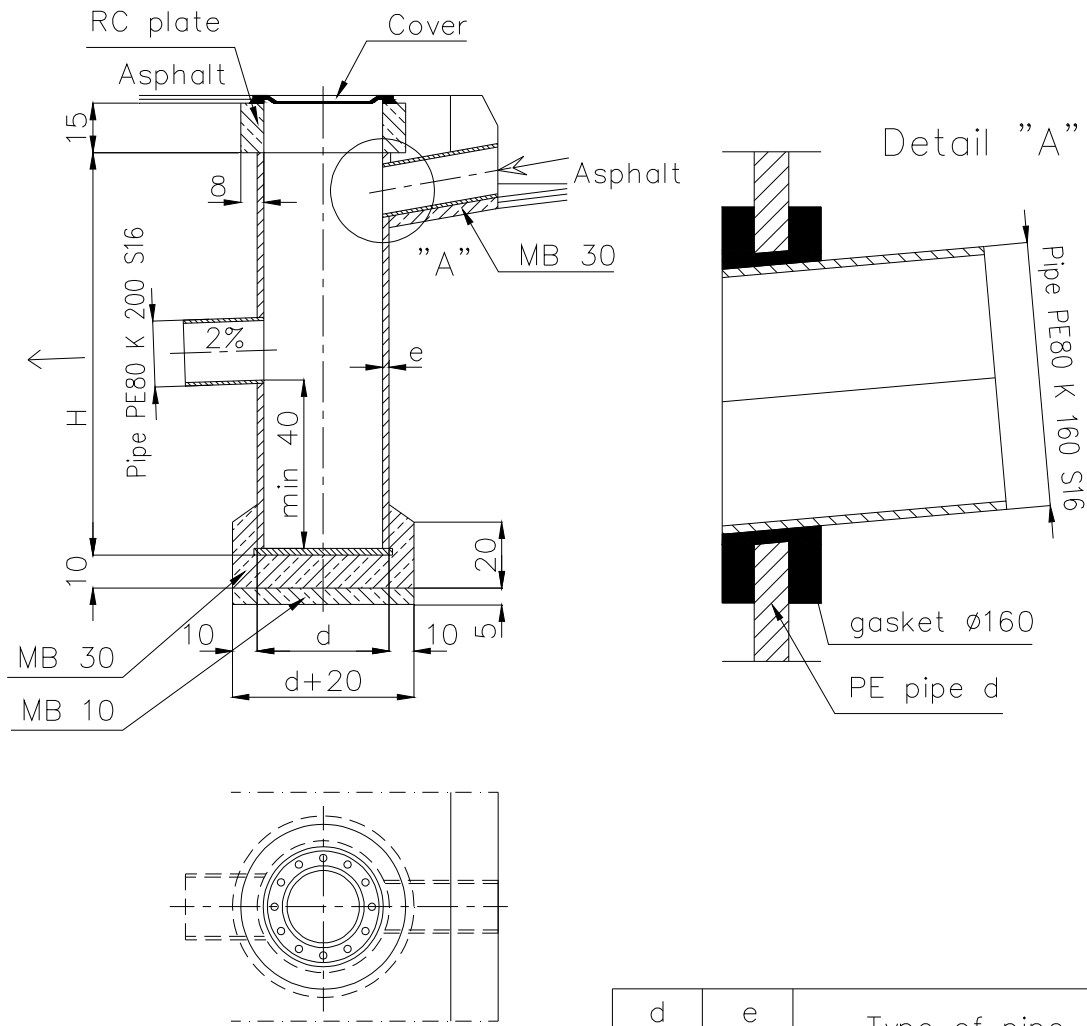
Gullies can be installed with inlet bellow pavement and inlet bellow roadway (see next drawings)



# PEHD and PP manholes and inspection chambers INSTALLATION GUIDELINES

## PE gully with inlet below pavement,

Depth:                     $H < 1,0\text{m}$   
                                   $1,0\text{m} < H < 1,5\text{m}$   
                                   $1,5\text{m} < H < 2,0\text{m}$   
                                   $2,0\text{m} < H < 2,5\text{m}$   
                                   $H > 2,5\text{m}$



d	e	Type of pipe
mm	mm	
400	12.3	Pipe PE80 K 400 S16
450	13.8	Pipe PE80 K 450 S16
500	15.3	Pipe PE80 K 500 S16

Note: dimensions in cm, except where otherwise indicated

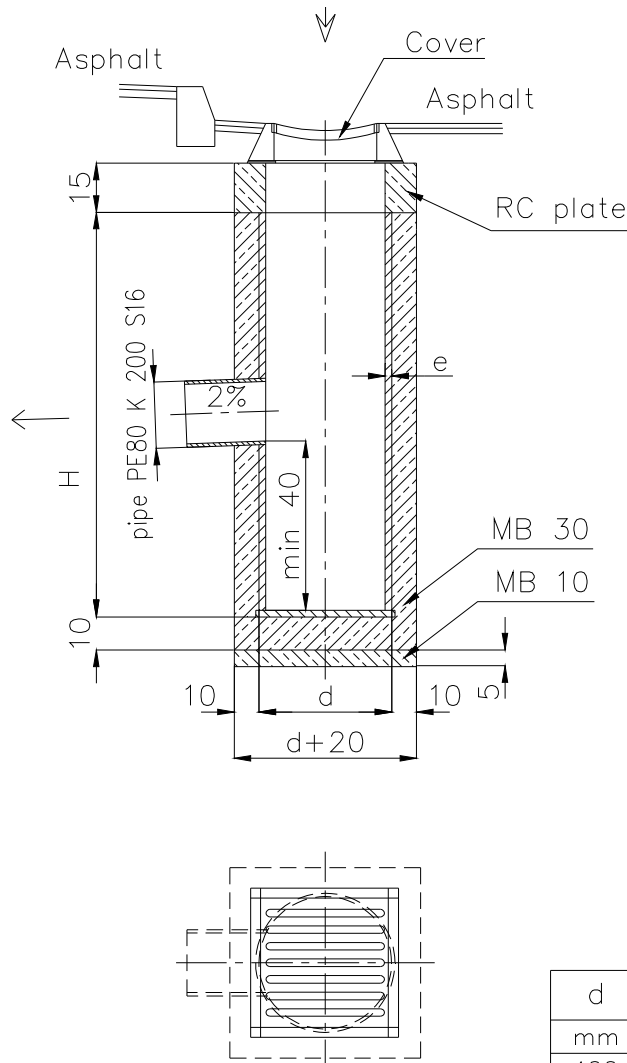




# PEHD and PP manholes and inspection chambers INSTALLATION GUIDELINES

## PE gully with inlet below roadway,

Depth:  $H < 1,0\text{m}$   
 $1,0\text{m} < H < 2,0\text{m}$   
 $H > 2,0\text{m}$



d	e	Type of pipe
mm	mm	
400	12.3	Pipe PE80 K 400 S16
450	13.8	Pipe PE80 K 450 S16
500	15.3	Pipe PE80 K 500 S16

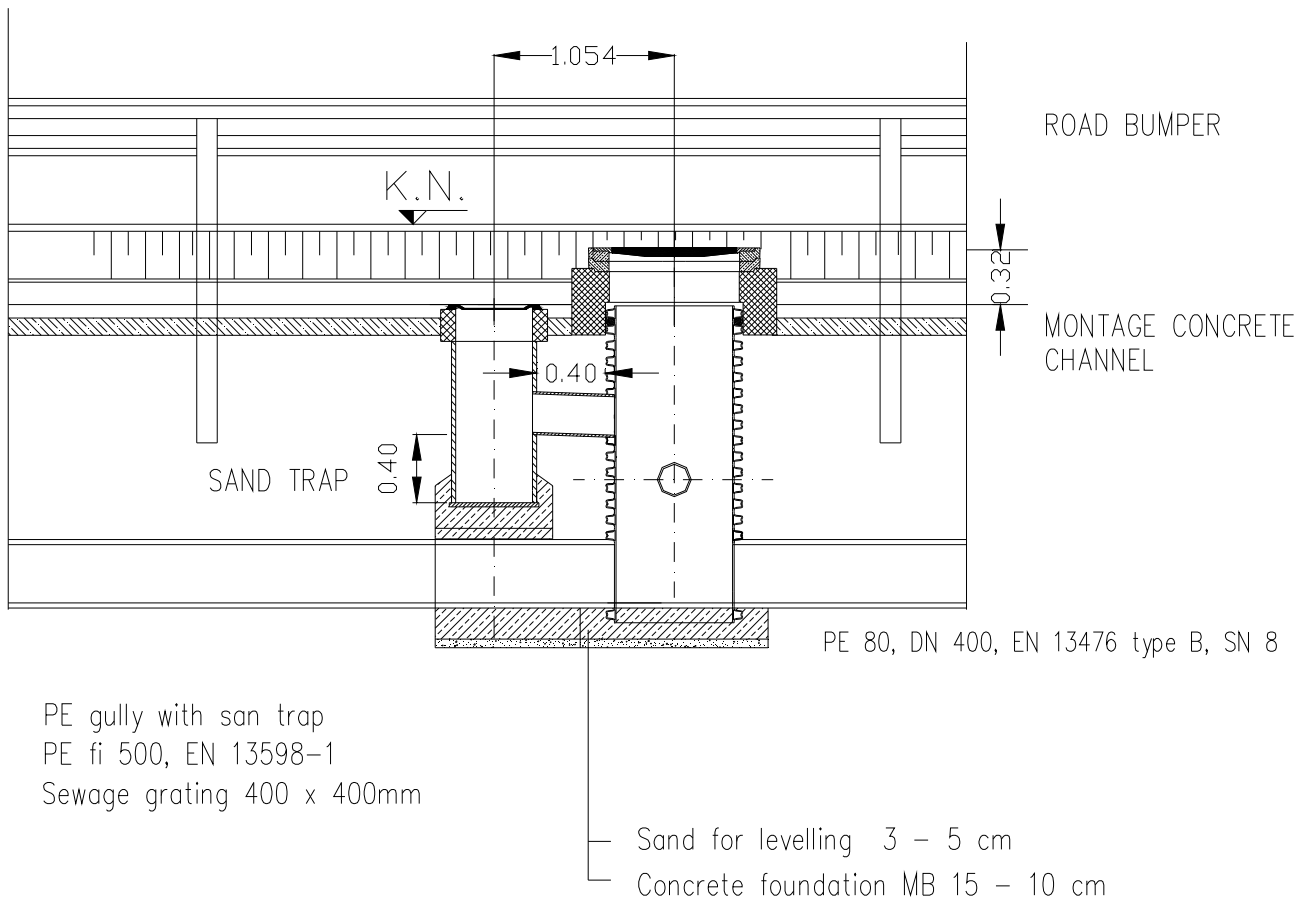
Note: dimensions in cm, except where otherwise indicated



# PEHD and PP manholes and inspection chambers INSTALLATION GUIDELINES

## Connection PE gully in the montage concrete channel

Manhole  
PE, SN8, f fi 800  
Cast iron cover fi 450





## PEHD and PP manholes and inspection chambers INSTALLATION GUIDELINES

### MAINTENANCE OF SEWERAGE

Maintenance of sewerage is considered cleaning blocked canals, manholes, gullies and house connections:

#### **- cleanse under high pressure and sucking in manholes**

This method of cleaning is the most efficient and fastest method of cleansing the profile pipeline up to Ø 600 mm. High pressure hose through the appropriate pulley pulled off from the road into the canal without entry of workers into the underground. Support staff have the task of serving only the appropriate stop elements and removing the leached waste, and if necessary, vacuum suck up sludge from the manhole.

#### **- cleaning road gullies;**

Cleaning is done by dipping the suction hose into the gully, and the contents sucked directly into the vacuum tank for disposal. Gullies should be regularly

cleaned at least twice a year - in the spring after snowmelt and washing streets with fine gravel and after the heavy showers after a long dry period (late summer and early autumn)

#### **- cleaning house connections and connections of gullies;**

In these parts of the canal system usually leads to delay rags, paper, fibers which can completely shut down the whole profile. Where is applicable, the connections are cleaned or washed by previously mentioned methods. Use elastic wire cable or spirals if it is not applicable classic method for cleaning.

**With frequent stopping up, it is necessary to verify if the connection is properly building constructed. The costs of cleaning or reconstruction shall be borne by the user terminals.**