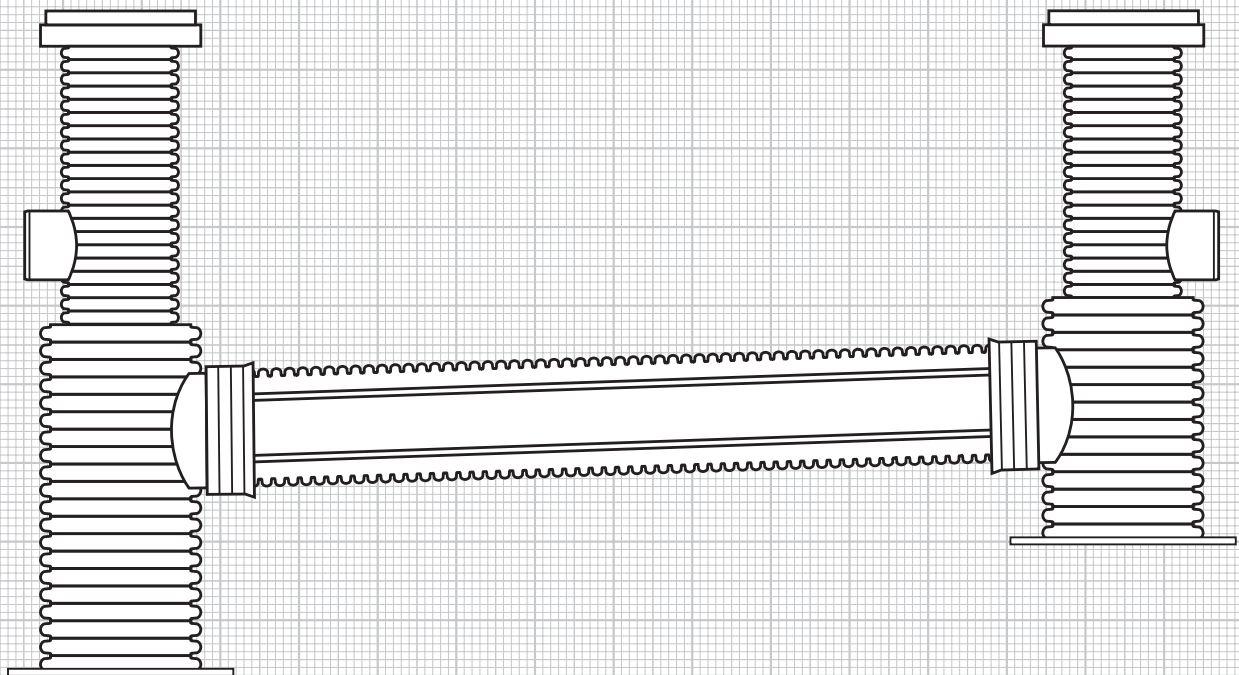


Installation and maintenance manual

SediPipe® L / SediPipe® L plus



Stormwater treatment



1 Contact and service



www.fraenkische.com/contact-drainage



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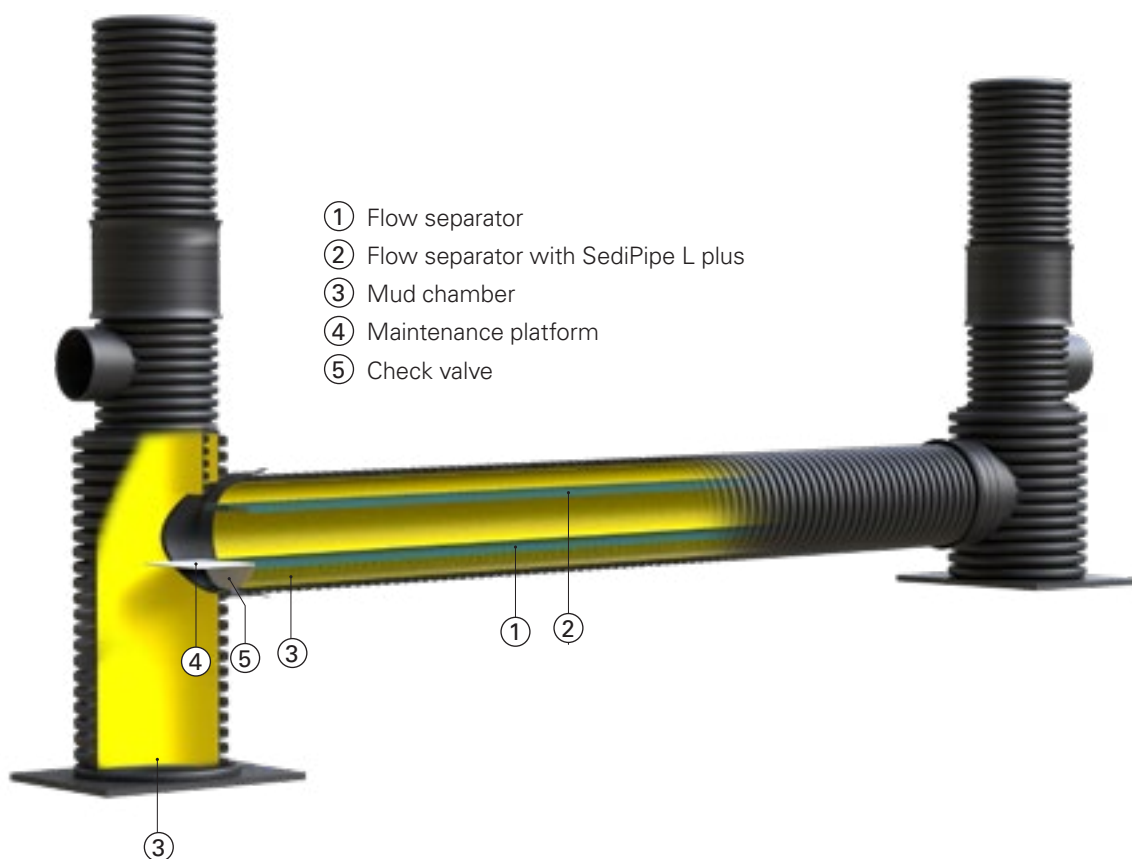
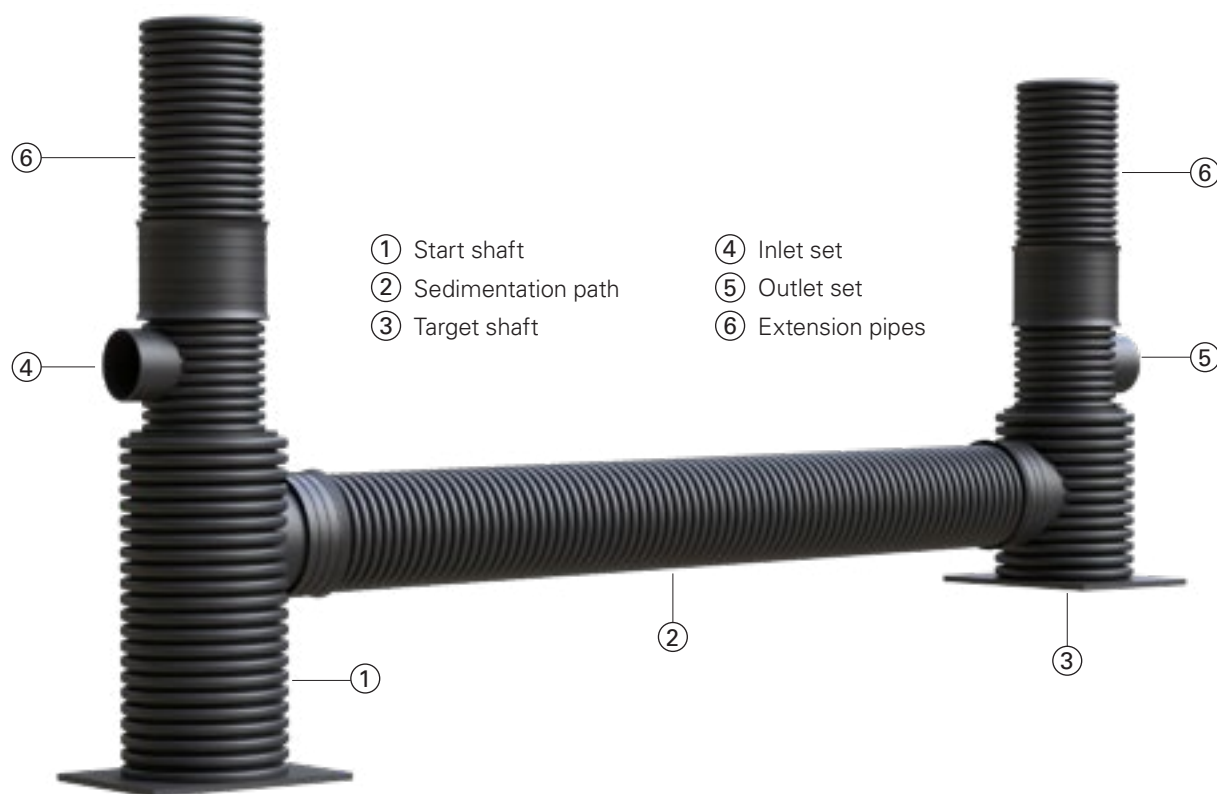
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NB

Please read this installation manual carefully and follow our instructions.

The relevant safety provisions of the building industry apply.

2 SediPipe® L and SediPipe® L plus at a glance



3 System description

3.1 Application

SediPipe L and SediPipe L plus are stormwater treatment systems for polluted stormwater runoff, e.g., from traffic areas. The systems separate

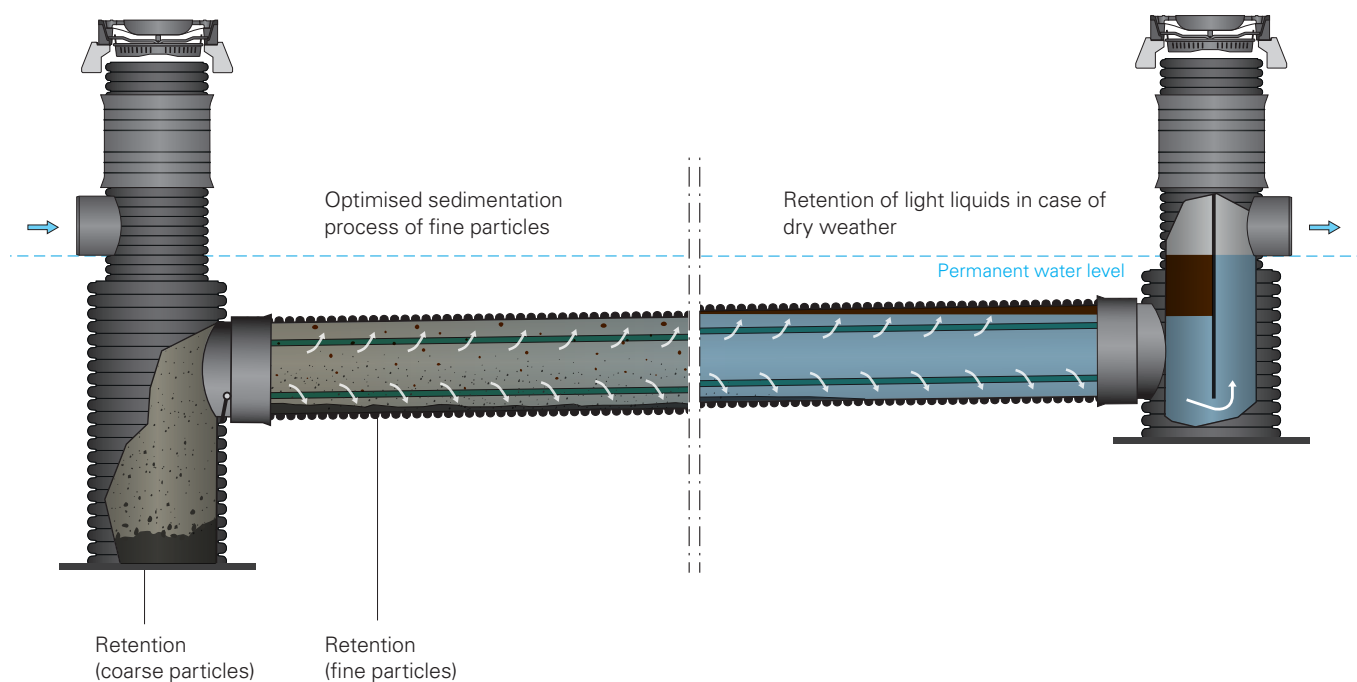
washed-up particles and light liquids (oil) from stormwater and reliably retain these materials in the system, even in case of spills in dry weather.

3.2 Function description

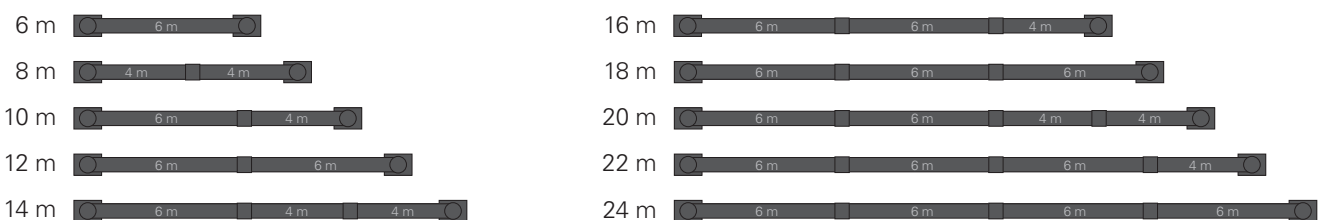
SediPipe L and SediPipe L plus are stormwater treatment systems which keep a permanent water level. Coarse particles are already retained in the start shaft.

Fine particles are retained in the sedimentation path. The lower flow separator prevents remobilisation and therefore discharge of sediment also during heavy rain.

Systems of the SediPipe L plus type additionally feature an upper flow separator leading to increased separation performance for light liquids in rainfall events.



3.3 Sizes



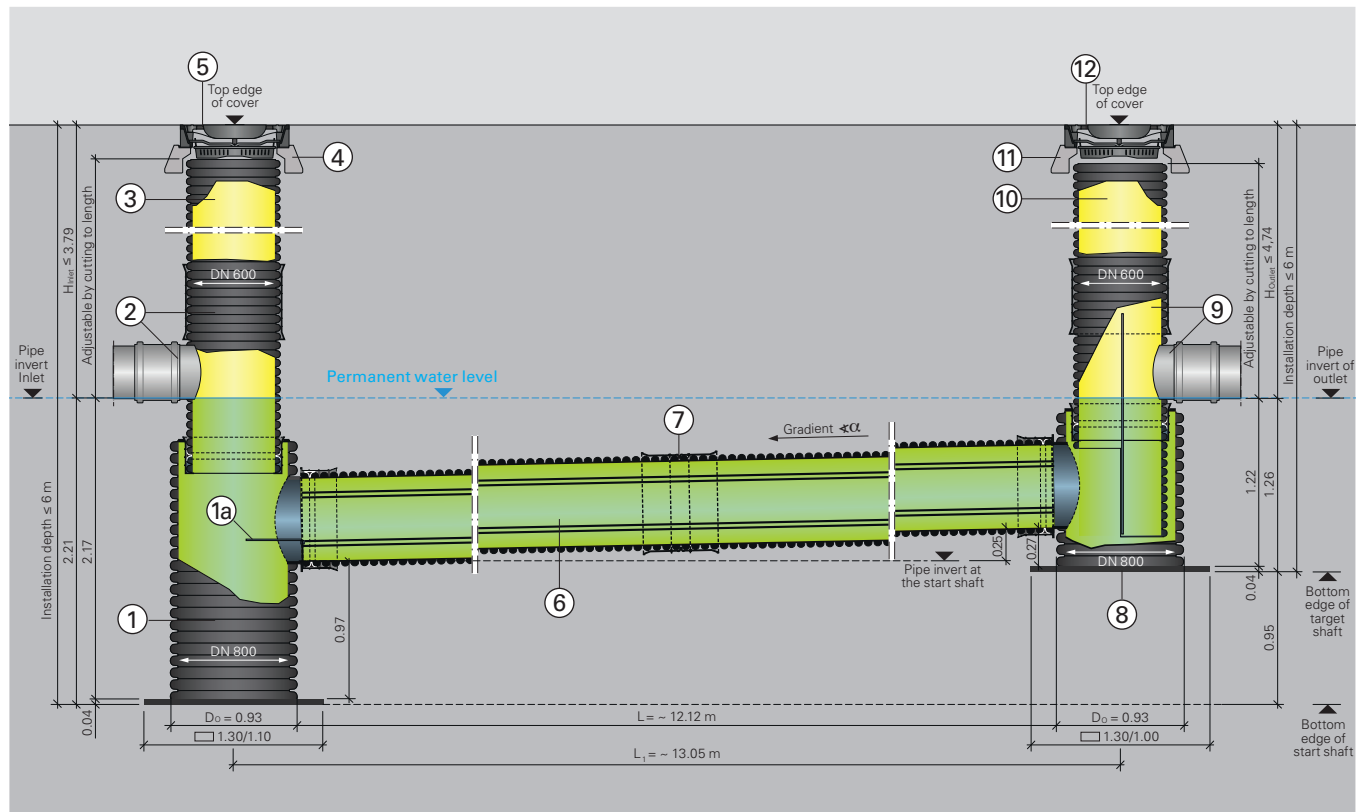
3.4 SediPipe® L and SediPipe® L plus system description

Systems of the SediPipe L and SediPipe L plus design are comprised of a start shaft, a target shaft and a sedimentation path. The shafts are delivered as a three-piece push-fit system and comprise a shaft bottom with a factory-welded base

plate, an inlet and/or outlet set and an extension pipe which can be cut to length individually. The sedimentation path is comprised of one or several main pipes. The total length of the sedimentation path depends on the system type and

varies between 6 m and 24 m.

The target shaft features an immersion wall. The sedimentation path features a construction-related upward gradient when installed.



Section SediPipe L plus 600/12

Start shaft components:

- ① Shaft bottom DN 800 with base plate
- ①a with maintenance console
- ② Inlet set DN 600 with connection DN/OD 315 and/or DN/OD 400, incl. coupling DN 600 and sealing rings
- ③ Extension pipe DN 600
- ④ Class D BARD ring
- ⑤ Cover CW 610 with ventilation (to be supplied on site)

Sedimentation path components:

- ⑥ Sedimentation pipe(s) DN 600 with flow separator(s), installation length 6 m
- ⑦ Coupling(s) and sealing rings

Target shaft components:

- ⑧ Shaft bottom DN 800 with base plate
- ⑨ Outlet set DN 600 with connection DN/OD 315 or DN/OD 400, incl. coupling DN 600 and sealing rings
- ⑩ Extension pipe DN 600
- ⑪ Class D BARD ring
- ⑫ Cover CW 610 with ventilation (to be supplied on site)

3.5 Technical data

SediPipe L / SediPipe L plus	600/6	600/8	600/10	600/12	600/14	600/16	600/18	600/20	600/22	600/24
Length L [m]	6.10	8.10	10.11	12.12	14.14	16.15	18.17	20.18	22.19	24.22
Length L ₁ [m]	7.03	9.03	11.04	13.05	15.07	17.08	19.10	21.11	23.12	25.15
Height of inlet H _{Inlet} [m]	≤ 3.79	≤ 3.79	≤ 3.79	≤ 3.79	≤ 3.79	≤ 3.79	≤ 3.79	≤ 3.79	≤ 3.79	≤ 3.79
Height of outlet H _{Outlet} [m]	≤ 4.74	≤ 4.74	≤ 4.74	≤ 4.74	≤ 4.74	≤ 4.74	≤ 4.74	≤ 4.74	≤ 4.74	≤ 4.74
Diameter of the sedimentation path [mm]	600	600	600	600	600	600	600	600	600	600
Length of the sedimentation path [m]	6	8	10	12	14	16	18	20	22	24
Sedimentation path gradient [%]	4.0	3.0	2.4	2.0	1.7	1.5	1.3	1.2	1.1	1.0
Sedimentation path gradient as angle α	2.3°	1.7°	1.4°	1.1°	1.0°	0.9°	0.8°	0.7°	0.6°	0.6°
Collecting volume of light liquids ¹⁾ [litres]	1990	2410	2840	3270	3700	4130	4560	4990	5420	5860
Collecting volume of the mud chamber [litres]	770	830	900	970	1040	1110	1180	1250	1320	1390
Permanent water level volume [litres]	3240	3800	4360	4920	5480	6040	6600	7160	7720	8280
Sedimentation pipe material	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP
Shaft material	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP

¹⁾ Retention of light liquids in case of spills in dry weather

3.6 Installation depths

The stability of the system has been proven by standard statics. The maximum installation depth of the shafts from the top edge of terrain to the shaft bottom, also in case of groundwater, is 6 m depending on installation parameters (soil temperature ≤ 23 °C). The minimum depth of the system derives from the minimum required

distance between the pipe crown of the inlet channel and/or outlet channel and the bottom edge of the BARD ring of 35 cm. With a conventional class D cover without equalisation ring this corresponds to an inlet channel soil depth of 1.02 m for a DN/OD 315 connection. Connections DN/OD 400 correspond to an inlet channel soil depth of 1.10 m.

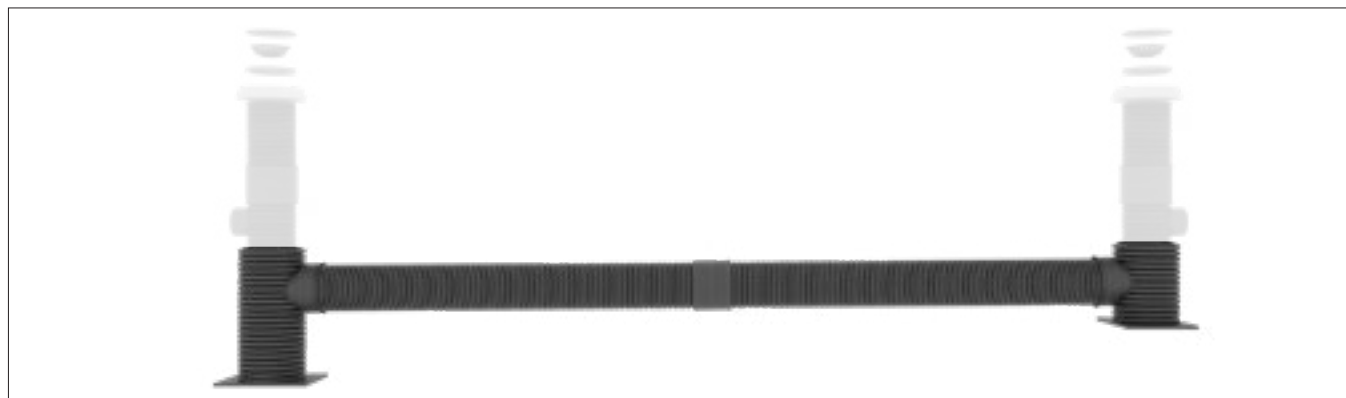
3.7 Overview of system component sets

In the ordering process, each system is comprised of a basic set and a connection set and the covers CW 610 with ventilation openings to be supplied on site.

The basic set comprises the start and target shaft bottom DN 800, including the sedimentation pipe. The size determines the number of sedimentation pipes.

SediPipe L / SediPipe L plus basic set

System size	600/6		600/8		600/10		600/12		600/14		600/16		600/18		600/20		600/22		600/24	
Basic set	SediPipe L	SediPipe L plus	SediPipe L	SediPipe L plus	SediPipe L	SediPipe L plus	SediPipe L	SediPipe L plus	SediPipe L	SediPipe L plus	SediPipe L	SediPipe L plus	SediPipe L	SediPipe L plus	SediPipe L	SediPipe L plus	SediPipe L	SediPipe L plus	SediPipe L	SediPipe L plus
Cat. no.	51597806	51597906	51597808	51597908	51597810	51597910	51597812	51597912	51597814	51597914	51597816	51597916	51597818	51597918	51597820	51597920	51597822	51597922	51597824	51597924
	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).
Shaft bottom start shaft DN 800 with base plate; connection 1x DN 600; total height approx. 2.0 m; labelling: "Start shaft bottom SediPipe L oSS L"	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
Shaft bottom start shaft DN 800 with base plate; connection 1x DN 600; total height approx. 2.0 m; labelling: "Start shaft bottom SediPipe L plus"	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1
Sedimentation pipe DN 600 with lower flow separator, installation length of 6 m each	1	-	-	-	1	-	2	-	1	-	2	-	3	-	2	-	3	-	4	-
Sedimentation pipe DN 600 with lower flow separator, installation length of 4 m each	-	-	2	-	1	-	-	-	2	-	1	-	-	-	2	-	1	-	-	-
Sedimentation pipe DN 600 with lower and upper flow separator, installation length of 6 m each	-	1	-	-	-	1	-	2	-	1	-	2	-	3	-	2	-	3	-	4
Sedimentation pipe DN 600 with lower and upper flow separator, installation length of 4 m each	-	-	-	2	-	1	-	-	-	2	-	1	-	-	-	2	-	1	-	-
Coupling DN 600	0		1		1		1		2		2		2		3		3		3	
Profile sealing ring DN 600	2		4		4		4		6		6		6		8		8		8	
Tubes of lubricant, 500 ml	2		3		3		3		4		4		4		5		5		5	
Shaft bottom target shaft DN 800 with base plate; connections 1x DN 600, total height approx. 1.2 m; labelling: "Target shaft bottom SediPipe L / L plus"	1		1		1		1		1		1		1		1		1		1	



SediPipe L / SediPipe L plus basic set

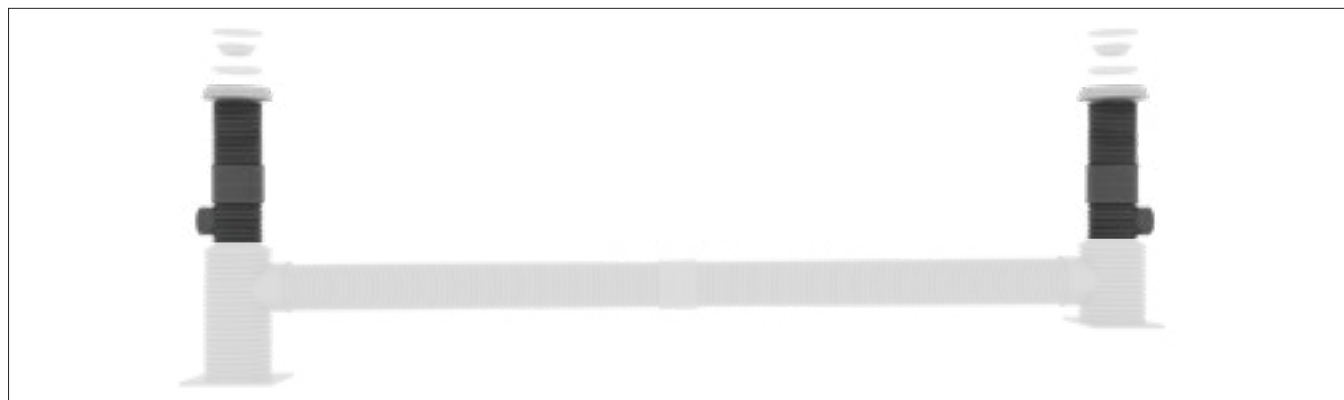
The connection set includes the inlets and outlets as well as the extension pipes for different sewer depths.

The sets are available in different designs to ideally adapt the complete system to the project-specific requirements. You can select as follows depending on the desired system size, installation depth, nominal diameter and number of inlets.

SediPipe L / SediPipe L plus connection set

Inlet channel soil depth	up to 2.5 m			greater than 2.5 m (*)		
Inlet and outlet connection	DN/OD 315	DN/OD 400	Inlets DN/OD 400 and 2x DN/OD 315 and outlet DN/OD 400	DN/OD 315	DN/OD 400	Inlets DN/OD 400 and 2x DN/OD 315 and outlet DN/OD 400
Cat. no.	51597850	51597860	51597855	51597851	51597861	51597856
	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).	pc(s).
Inlet set DN 600 with connection DN/OD 315, incl. coupling DN 600 with sealing ring	1	-	-	1	-	-
Inlet set DN 600 with connection DN/OD 400, incl. coupling DN 600 with sealing ring	-	1	-	-	1	-
Inlet set DN 600 with connections DN/OD 400, DN/OD 315 and DN/OD 315, incl. coupling DN 600 with sealing ring	-	-	1	-	-	1
Extension pipe DN 600, 1.6 m length	2	2	2	-	-	-
Extension pipe DN 600, 2.9 m length	-	-	-	1	1	1
Extension pipe DN 600, 3.8 m length	-	-	-	1	1	1
Class D BARD ring	2	2	2	2	2	2
Outlet set DN 600 with connection DN/OD 315, incl. coupling DN 600 and sealing ring	1	-	-	1	-	-
Outlet set DN 600 with connection DN/OD 400, incl. coupling DN 600 and sealing ring	-	1	1	-	1	1
Profile sealing ring DN 600	4	4	4	4	4	4
Lubricant, 500 ml	3	3	3	3	3	3

*) Max. soil depth from Chapter 3.5 "Height of inlet H_{Inlet} [m]" and "Height of outlet H_{Outlet} [m]"



SediPipe L / SediPipe L plus connection set

4 Installation

Depending on on-site conditions, installation of the system can begin either at the start shaft or at the target shaft.

Supply pipe available:

Beginning at the start shaft as shown in Chapter 4.1.a

4.1.a Overview of installation steps – starting with the start shaft



1

Start shaft bottom with inlet set
Chapter 4.5



2

Sedimentation pipes
Chapter 4.6



3

Target shaft bottom with outlet set
Chapter 4.7



4

Extension pipes and covers
Chapter 4.9
Chapter 4.12
Chapter 4.13

Drainage pipe or storage/infiltration system available:

Beginning at the target shaft as shown in Chapter 4.1.b

4.1.b Overview of installation steps – starting with the target shaft

**1**

Target shaft bottom with outlet set
Chapter 4.5

**2**

Sedimentation pipes
Chapter 4.6

**3**

Start shaft bottom with inlet set
Chapter 4.7

**4**

Extension pipes and covers
Chapter 4.9
Chapter 4.12
Chapter 4.13

4.2 Transport and construction site storage

The components must be specifically prepared for transport and lifting. Use one or two wide hoisting slings or round slings for this purpose.

The heaviest component is the shaft base element of the start shaft, weighing 200 kg.



Storage on sleepers



NB

Store all components on plain ground using sleepers and secure against shifting. Damaged parts must NOT be installed. Do NOT throw components!

Only install and lift components at temperatures above freezing.

4.3 Temporary construction site cover



The inlet and outlet set is delivered with temporary construction site covers.

Make sure that no dirt, e.g., backfill material, enters the system during the construction period. Do NOT remove the temporary construction site covers before installing extension pipes and/or shaft covers. Additionally protect shaft openings from earth slides until final installation of shaft covers.

NB

Shafts must NOT be accessed before installing the cover. If necessary, the required load transfer to the native soil must be ensured, e.g., using a wide steel plate.

4.4 Excavating pit and creating embedding



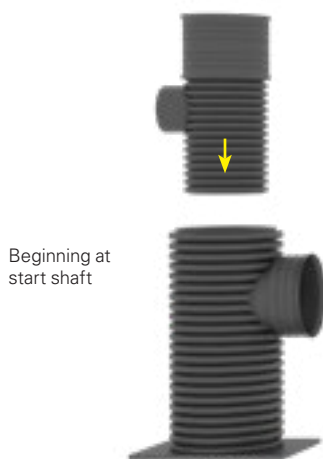
In addition to the regulations of DIN EN 1610, observe the specifications of DIN 18300 "Earthworks" (*Erdarbeiten*) in the latest version regarding excavating the pit and creating the lower embedding of the start and target shaft and the sedimentation path. If the native soil is not made up of stoneless, compactable material G1 (GE, GW, GI, SE, SW, SI) or G2 (GU, GT, SU, ST), create an embedding according to DIN EN 1610. The embedding shall generally be created with a consistent degree of compaction of $D_{Pr} \geq 95\%$ and a load-bearing capacity of $E_{v2} \geq 45 \text{ MN/m}^2$.

The minimum widths according to DIN EN 1610 must be strictly adhered to when creating pipe swales. Please observe any deviating minimum widths in the area of the shafts according to local specifications.

ATTENTION

The bearing heights of the start shaft and the target shaft and the required height difference must be created according to design specifications. (see 3.5. Technical data)

4.5 Installing the first shaft bottom with inlet or outlet set



Place the shaft bottom at the appropriate height on the prepared planum and secure it to prevent shifting. Make sure no backfill material enters the shaft (use temporary construction site cover).

Connect the supply pipe and drainage pipe according to design specifications.

Remove the shaft bottom's temporary construction site cover and subsequently place it on the coupling of the inlet or outlet set. Install the set in the top coupling of the first shaft bottom.

Keep the end of the set to be inserted, the profile sealing ring and the coupling

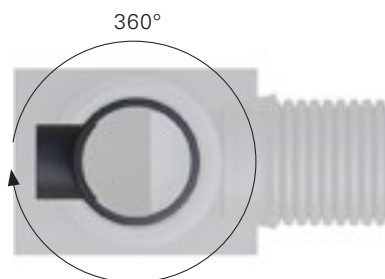
clean. Mount the profile sealing ring onto the **second** corrugation trough. Then apply a sufficient amount of lubricant to the profile sealing ring and coupling. Make sure that the sealing area is free of dirt.

The coupling factory-mounted to the connection pipe (for later installation of the extension pipe) is at the top.

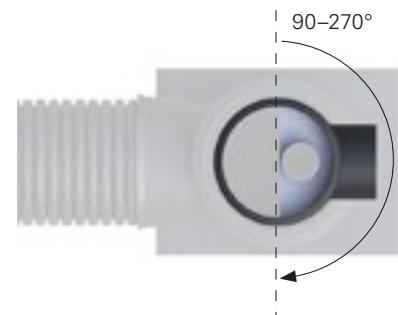
Turn the connecting tee to establish the inlet and outlet angle. The direction of the inlet and outlet channel defines the rotational direction of the connection set. The following connection angles are possible:



Connection angle inlet



Connection angle outlet



4.6 Installing the sedimentation path

NB

This step is relevant for all systems larger than 6 m and, depending on the size, must be carried out several times.



Mount profile sealing rings onto the first corrugation trough on each side while still outside the excavation pit. The pipe must be clean. Afterwards, install the coupling.



Move the sedimentation pipe to the installation position using lifting equipment. The crown marking must face upwards! The integrated flow separator faces downwards! SediPipe L plus features one upper and one lower flow separator.



Keep the pipe, the profile sealing ring, and the coupling clean. Then apply a sufficient amount of lubricant to the profile sealing ring and coupling. Make sure that the sealing area is free of dirt. Deepen the embedding in the area of the couplings as required. In order to prevent the profile sealing ring from resting on the bearing, the pipe end to be installed can rest on square timber.



ATTENTION

Secure the pipes to prevent shifting during installation.

ATTENTION

The crown marking of the pipe section must face upwards. The flow separators of the individual sedimentation pipes then form an overall consistently level surface. The crown markings of pipe and coupling must match exactly for all pipe installations.

Use a long lever to install the pipe. Place a board or square timber under the unattached pipe end to prevent damage to the pipe. Pipes must be installed horizontally. Mark the insertion depth on the pipe beforehand. Afterwards, create the pipe gradient by aligning the pipe. When completing the lower embedding by means of tamping, make sure that the bottom side of the pipes rests completely on the compacted foundation.

4.7 Installing the second shaft bottom with inlet or outlet set

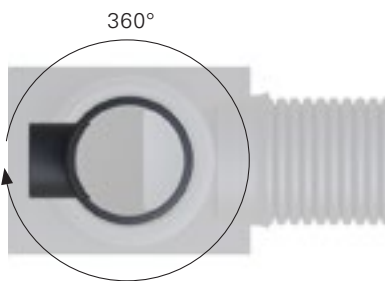
Place the second shaft bottom at the appropriate height on the prepared planum. Afterwards, prepare the coupling connection and mount the shaft onto the sedimentation pipe.

Connect the supply pipe and drainage pipe according to design specifications. Remove the shaft bottom's temporary construction site cover and subsequently place it on the coupling of the inlet or outlet set.

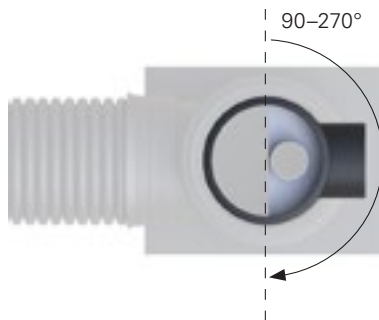
Install the set in the top coupling of the second shaft bottom. The coupling factory-mounted to the connection pipe for later installation of the extension pipe is at the top.

Turn the connecting tee to establish the inlet and outlet angle. The direction of the inlet and outlet channel defines the rotational direction of the connection set. The following connection angles are possible:

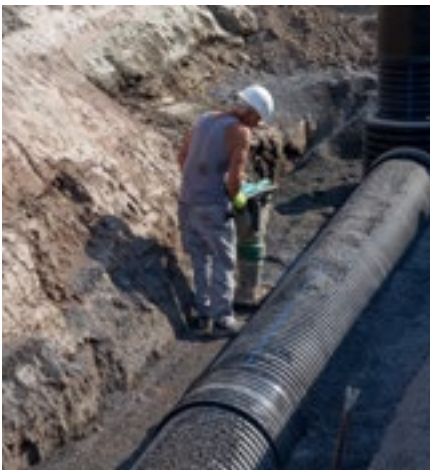
Connection angle inlet



Connection angle outlet



4.8 Creating upper embedding, side filling and cover (up to the top edge of the shaft bottom)



Compacting of lateral backfilling

The specifications of the latest version of DIN EN 1610 must be adhered to when creating the upper embedding, side filling and cover up to the top edge of the shaft bottom. If country-specific regulations or deviating specifications conflict with this, these must be agreed upon with FRÄNKISCHE, if necessary.

Create the backfilling with stoneless, compactable material G1 (GE, GW, GI, SE, SW, SI) or G2 (GU, GT, SU, ST) according to DIN EN 1610 and create a consistent degree of compaction of $D_{Pr} \geq 95\%$ and a load-bearing capacity of $E_{v2} \geq 45 \text{ MN/m}^2$.

Make sure that shafts and sedimentation pipes do not shift during backfilling of the excavation pit.

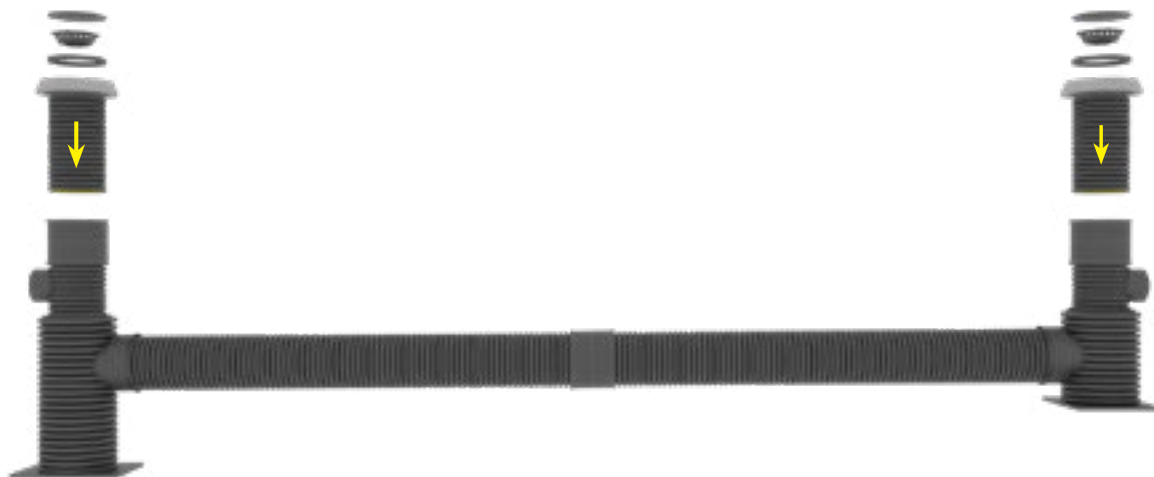
ATTENTION

Do NOT remove the temporary construction site covers before finishing main backfilling!

4.9 Installing extension pipes

Now, place the extension pipes over the couplings DN 600. Keep the pipe, the profile sealing ring, and the coupling clean. Mount the profile sealing rings onto the second corrugation trough.

Then apply a sufficient amount of lubricant to the profile sealing ring and coupling. Make sure that the sealing area is free of dirt.



4.10 Tests before backfilling and impermeability test

Before backfilling the excavation pit, check the system for proper installation and leak-tightness.

The following tests must be performed in particular:

- 1 Height of the shafts according to design specifications
- 2 Exact adjustment of the shafts
- 3 Check for damage, foreign objects or coarse contamination
- 4 Axial direction of the system
- 5 Total insertion depth at the couplings
- 6 Position and matching of crown markings (top)
- 7 Impermeability test

NB

We recommend approval of the system by site management before backfilling.

4.11 Completing cover and creating main backfilling

Backfilling work is finished after installing the extension pipes. Provide a soil cover of at least 30 cm for the sedimentation path. The materials for main backfilling must be filled and compacted according

to design specifications. Make sure that shafts and sedimentation pipes do not shift during backfilling of the excavation pit. Accessing is only permitted after main backfilling has been completed.



Compacting

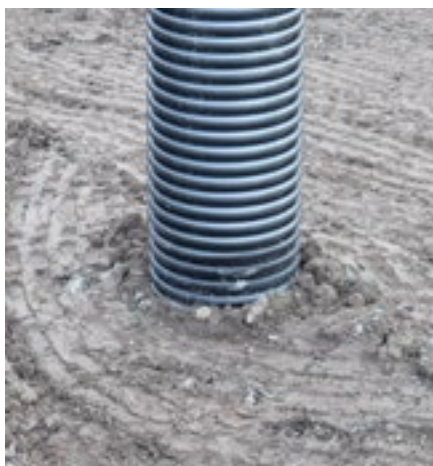


Extension pipe with temporary construction site cover

NB

Do NOT remove the temporary construction site covers or protective covers of the extension pipes before finishing main backfilling!

4.12 Cutting extension pipes



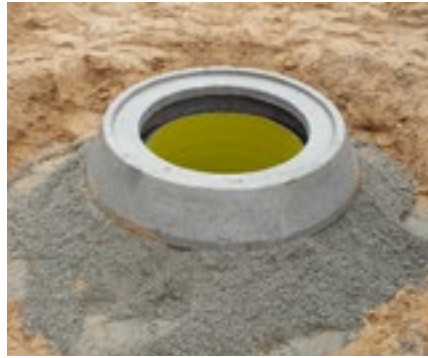
Cut the extension pipes such that they reach the support ring. Cut the pipes to length in the middle of the corrugation trough and align upright to the pipe axis using a fine-toothed saw or other appropriate tools. Remove edges and irregularities on the cutting surfaces with a grater, file or another suitable tool.

You might have to cut the coupling as well in case of minimum covers. The BARD ring has a sufficient diameter and can be pushed over the coupling.

NB

Height adjustment extension pipe per corrugation crown ~7 cm

4.13 Installing shaft covers



The BARD ring (class D concrete support ring by FRÄNKISCHE) transfers traffic loads into the soil. There must be no direct load transfer between BARD ring and shaft. The bedding area of the BARD ring must be flat and without stationary loads, and it must achieve an E_{v2} module of at least 100 MN/m^2 . Create the bearing from compacted bearing layer material (E_{v2} module larger than or equal to 100 MN/m^2) or in-situ concrete C 16/20 with similar load-bearing properties. Avoid interlocking of the bearing with the corrugations of the extension pipe. Provide and use a casing aid on site!

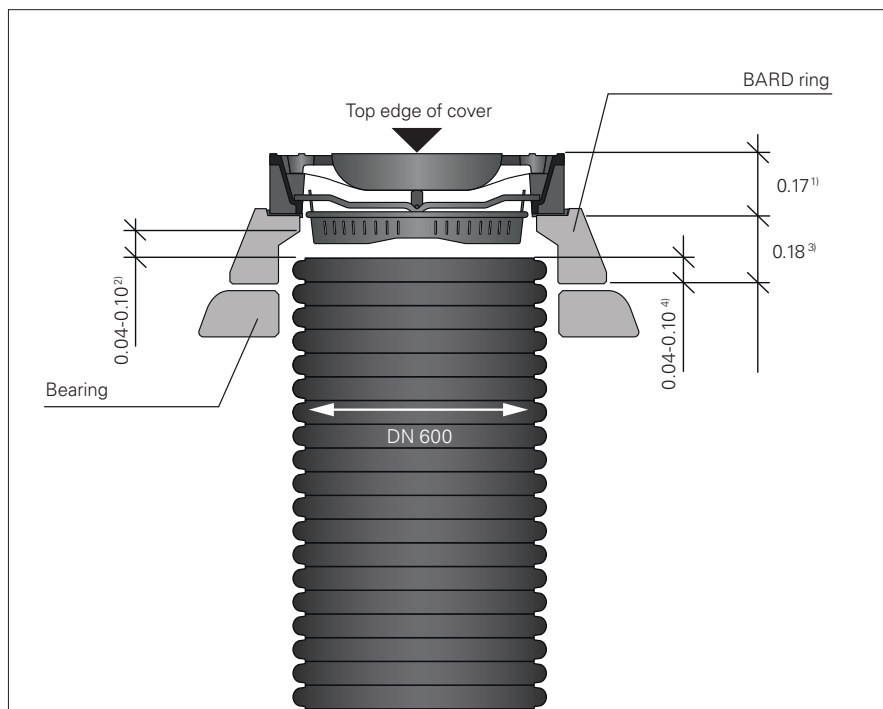
Vertical loads may only be transferred to the load-bearing underground. The BARD ring must be placed centrally without affecting the bearing.

Shaft covers, equalisation rings, gully gutters, bucket handles and buckets are not included in the scope of delivery of FRÄNKISCHE and must be supplied on site.

Install shaft covers according to DIN EN 124, CW 610, installation according to design specifications. Optionally, place equalisation rings according to DIN 4034 under the shaft cover/gully gutter on the BARD ring.

The shaft cover and/or equalisation ring(s) must be placed on a 1-cm-thick mortar joint to prevent stationary loads between the BARD ring, the equalisation ring and the shaft cover.

Use common dirt traps under the shaft covers. If the start shaft must feature a gully gutter according to design specifications, a bucket handle (or feed hopper) and a bucket according to DIN 4052-A4 must be installed.



¹⁾ Height of shaft cover incl. 1 cm mortar joint. The dimension is variable, depending on class B or D shaft cover and use of additional support rings (incl. mortar joint to ensure a bearing without stationary loads).

²⁾ Compensating area: 4 cm to 10 cm

³⁾ BARD ring, inside Ø 745 mm, h = 180 mm

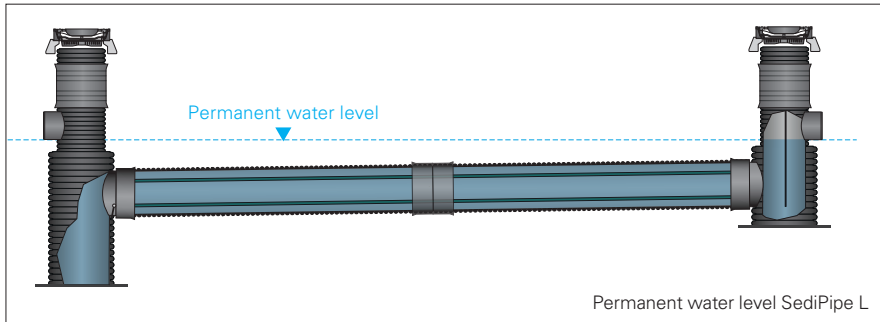
⁴⁾ Insertion area: extension pipe in BARD ring 4 cm to 10 cm, height adjustment in the insertion area accurate to within the last centimetre possible.

4.14 Filling the system

After the work has been completed, the system must be filled with water up to the permanent water level. This is required to ensure the retention of float-

ables and light liquids by the immersion wall. The system may already be filled with water due to the impermeability test (see 4.10). The system must be

filled with water (e.g., drinking water, service water, treated wastewater from system cleaning) complying with the local discharge conditions.



NB

For permanent water level volume, see 3.5 Technical data

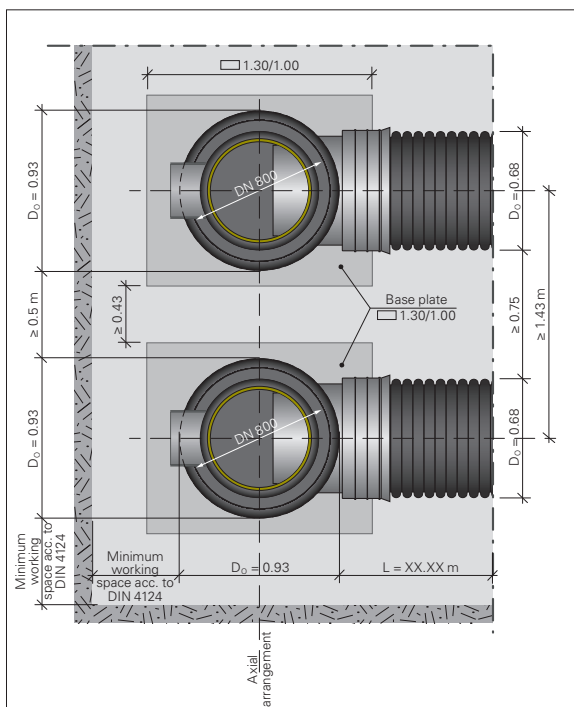
4.15 Arrangement of multiple SediPipe L systems

The above sections of the installation manual describe the standard installation as individual system. The following describes the recommendations for the arrangement of multiple systems and the required minimum distances. We draw your attention to the fact that for

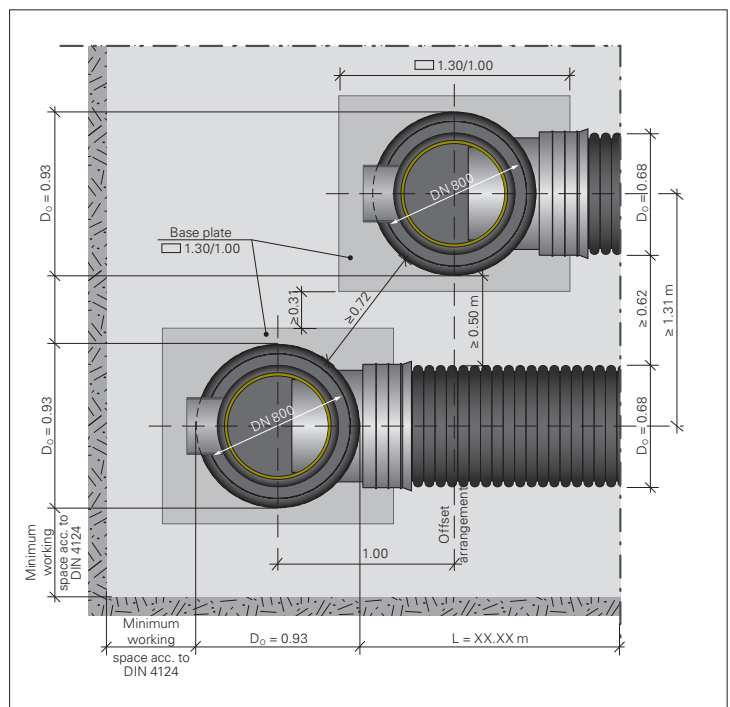
installation clearances between distribution and combining units and the treatment system, the respective fitting dimensions of the connection pipes and their space requirements must be considered for the installation in addition to the general minimum clearances specified by standards.

NB

Make sure that the system components are not damaged during backfilling or compacting. Observe the installation instructions for individual systems.



Axial arrangement



Offset arrangement

4.16 Putting into operation

ATTENTION

Observe Chapter 8 Safety instructions!

1 Making system ready for operation

- Clean system of coarse dirt.
- Remove auxiliary constructions.
- Fill system with water.
- Close shaft covers.



2 Instruction

1. The following people should be present during handover:

- Persons authorised by the principal to perform the acceptance
- Planner/engineering office
- Construction contractor
- Specialist/expert

We also recommend participation of operating staff.



2. Instruction

- Explanation of the system function
- Explanation of maintenance
- Information regarding cleaning and disposal
- Information about FRÄNKISCHE partner companies



3 Documentation/handover

- Handover of maintenance and installation manuals
- Handover of system documentation including operating log
- Optionally: documentation of thorough visual inspection
- Proof of system leak-tightness



5 Cleaning

5.1 Emptying and cleaning the system

All the emptying and cleaning work of the system described in this section must generally be made from the surface.

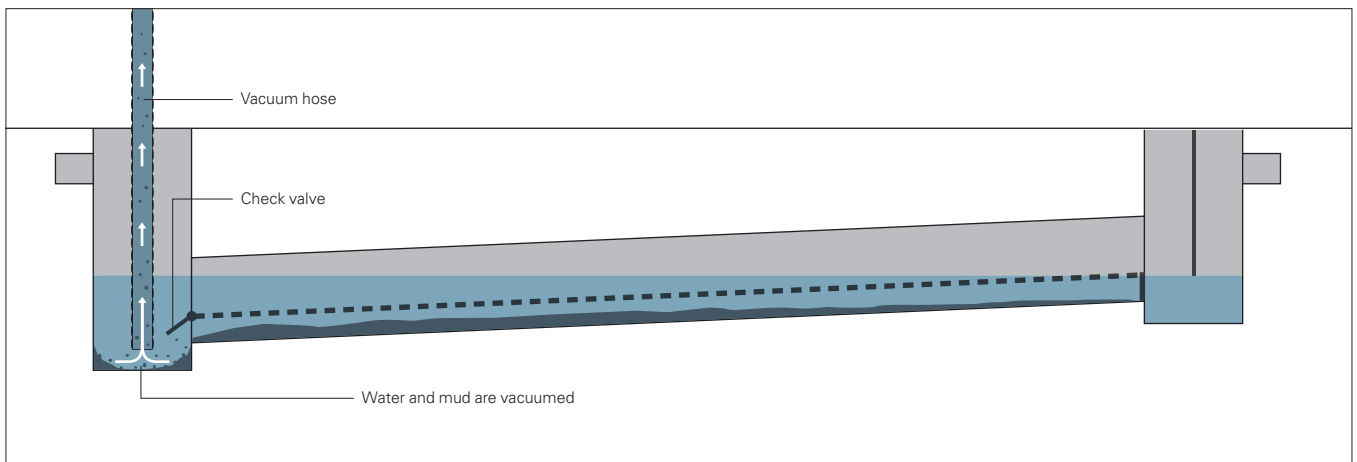
Use a high-pressure cleaning/vacuum vehicle to empty the system and remove the contained water and mud fractions. For this purpose, initially vacuum the

complete contents through the shaft. The valve flap sealing the sedimentation chamber of the sedimentation pipe can now be moved freely. Due to the upward gradient of the sedimentation pipe, most of its mud collector will be emptied of its contents into the start shaft.

ATTENTION

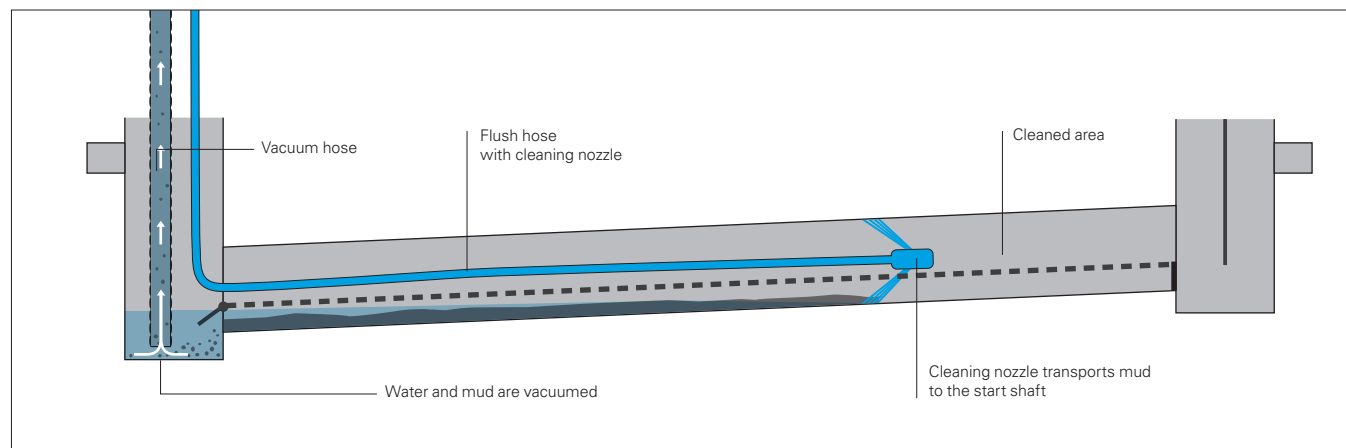
In the event of an oil spill, the system must be immediately maintained by a specialist and the washed matter must be disposed of appropriately. Vacuum light liquids via the inspection access in the target segment. Otherwise, subsequent rain may lead to a discharge of light liquids!

Step 1: Emptying with vacuum hose



Step 2: Cleaning with vacuum and flush hose

see next page

Step 2: Cleaning with vacuum and flush hose

When empty, the maintenance console mounted at the height of the flow separator is visible in the start shaft. The maintenance console facilitates inserting and guiding the flush hose during high-pressure cleaning.

The flush hose is guided through the maintenance console on the flow separator. The cleaning nozzle is guided up to the target shaft during high-pressure cleaning. Make sure that the nozzle

does not enter the target shaft. The efficiency of the vehicle and the cleaning and nozzle parameters must be selected depending on the pipe section, pipe material and degree of pollution to be expected.

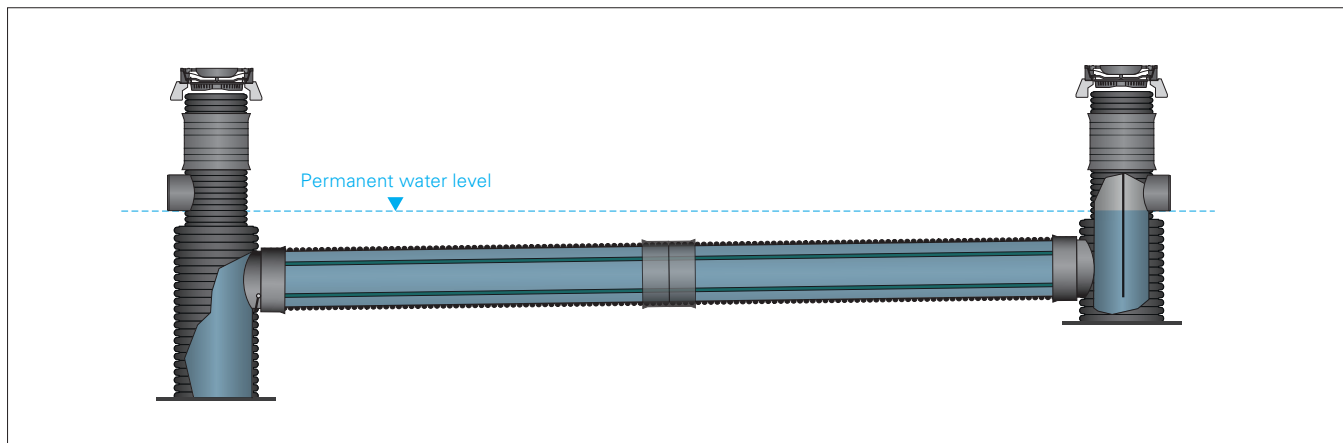
Use deflection pulleys to avoid damage to the system.

Afterwards, empty the target shaft using the vacuum hose. If necessary, clean the shaft.

NB

Combined flushing-vacuum vehicles with water recovery shall be preferably used. This minimises disposal expenses and the treated water can be used to refill the system.

5.2 Filling the system with water



Permanent water level SediPipe L

After the work has been completed, the system must be filled with water up to the permanent water level. This is required to ensure the retention of floatables and light liquids by the immersion wall.

The system must be filled with water (e.g., drinking water, service water, treated wastewater from system cleaning) complying with the local discharge conditions.

NB

For permanent water level volume, see 3.5 Technical data

6 Self-inspection, maintenance and examination

6.1 General information

To ensure functionality of the SediPipe L / SediPipe L plus system, its condition must be ensured through recurring self-inspections and maintenance. All work and findings must be documented in the operating log. We generally

recommend entering a maintenance agreement with an expert (FRÄNKISCHE partner company). Please see www.fraenkische.com for an overview of partner companies trained by FRÄNKISCHE.

ATTENTION

The respective periods and responsibilities are only a recommendation by FRÄNKISCHE and may differ from authority approvals. In these cases, the authorities' requirements are mandatory and must be observed!

6.2 Self-inspection

The operational capability of the system must be verified by the operator under dry weather conditions at least every three months. To do so, open the covers of the start and target shafts and visually inspect from the top without accessing the shafts themselves (simple visual inspection).

Check the following:

- Structural condition of the system
- Height of the permanent water level
- Mud level of the start shaft

ATTENTION

If a relevant deviation from normal conditions occurs which may impair the operational capability of the system, maintenance must be carried out in order to immediately eliminate the detected deficiencies.

6.3 Maintenance

If there are no system-specific empirical values regarding the actual volume of mud, the SediPipe L system must be maintained according to the following guiding values. Maintenance comprises cleaning only.

The following work must be performed:

- Emptying and cleaning of the system (see 5.1)
- Refilling the system (see 5.2)

	Maintenance interval 1 year	Maintenance interval 2 years	Maintenance interval 3 years	Maintenance interval 4 years
System type	Connectable area [m²]	Connectable area [m²]	Connectable area [m²]	Connectable area [m²]
SediPipe L / L plus 600/6	21450	10700	7150	5350
SediPipe L / L plus 600/8	23350	11650	7750	5800
SediPipe L / L plus 600/10	25300	12650	8400	6300
SediPipe L / L plus 600/12	27200	13600	9050	6800
SediPipe L / L plus 600/14	29150	14550	9700	7250
SediPipe L / L plus 600/16	31050	15500	10350	7750
SediPipe L / L plus 600/18	33000	16500	11000	8250
SediPipe L / L plus 600/20	34950	17450	11650	8700
SediPipe L / L plus 600/22	36850	18400	12250	9200
SediPipe L / L plus 600/24	38800	19400	12900	9700

Basis average volume of pollution 500 kg/ha*a (dry matter)

Tip

Operators can schedule the system-specific maintenance interval as described in the following to reduce operating costs or in case of special areas with increased mud volumes:

Provided that the complete system was cleaned after finishing construction, emptying and cleaning of SediPipe can take place depending on the mud level. To do so, measure the mud level in the start shaft during self-inspection.

We recommend emptying when 80 % of the mud storage volume or the maximum mud level in the start shaft have been reached. The storage volume can be obtained from the table (see Chapter 3.5 Technical data).

6.4 Disposal

Materials removed from the system such as mud and flushing water used to clean the system may contain hydrocarbons and heavy metals. Therefore, they must be disposed of in compliance with the applicable legal provisions. Waste fractions occurring after spills

with light liquids must be disposed of professionally as "oil/water separator contents" in compliance with the current waste catalogue. The statutory disposal and acceptance certificates must be included in the operating log together with the entries as evidence of proper disposal.

ATTENTION

Applicable waste disposal regulations must be observed when disposing of the matter extracted from the system.

6.5 Thorough visual inspection

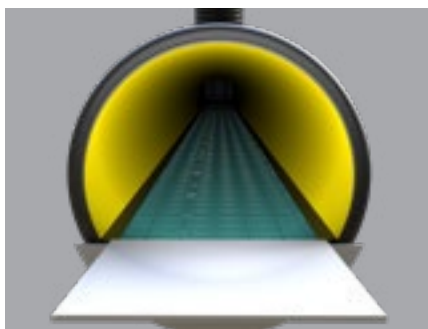
The structural condition of the sedimentation path can be examined by thorough visual inspection using CCTV inspection technology. For this purpose, the upper flow area is accessed with a state-of-the-art pan and tilt camera. The lower sedimentation chamber can be inspected

visually through the flow separator. Here, the maintenance console facilitates inserting the dolly and guiding the camera cable. Use appropriate deflection pulleys. Inspection equipment should be selected according to DWA worksheet and bulletin series DWA-A/M 149 "Conditions and

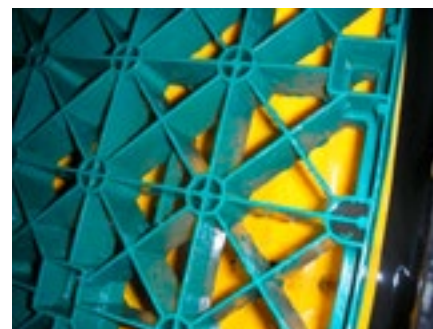
Assessment of Drain and Sewer Systems Outside Buildings" (*Zustandserfassung und -beurteilung von Entwässerungssystemen außerhalb von Gebäuden*) and should be adjusted to pipe section and pipe material.



Inspection of flushing results with pan and tilt camera, camera on the maintenance console in the start shaft of a SediPipe L system



Maintenance console = top edge of flow separator



Cleaned, residue-free system; the area of the flow separator is displayed here

7 Overview – Who does what?

	Who	What	When	Documentation
Installation	Specialist	<ul style="list-style-type: none"> ■ Installation, cleaning and CCTV inspection of the system ■ Filling the system with water from water recovery or with water complying with the local discharge conditions 		Operating log
Self-inspection	Operator	Simple visual inspection <ul style="list-style-type: none"> ■ Structural condition of the system ■ Height of the permanent water level ■ Mud level of the start shaft 	At least every 3 months	Operating log
Maintenance	Specialist	<ul style="list-style-type: none"> ■ Emptying and cleaning of the entire system using a sewer cleaning vehicle ■ Refilling the system with water from water recovery or with water complying with the local discharge conditions ■ Disposal of mud and solids ■ Applicable waste disposal regulations must be observed. 	Immediately after oil spill, otherwise see guiding values in the maintenance documentation	Operating log
Disposal	Specialist/waste disposal company	<ul style="list-style-type: none"> ■ Disposal of mud and solids ■ Applicable waste disposal regulations must be observed. 	When the retention volume has been used up	Operating log Disposal certificates
Repairs	Specialist	Only original parts or tailored parts explicitly approved by the manufacturer may be used.	As required	Operating log

8 Safety instructions

ATTENTION

Staff responsible for installation, assembly, operation, maintenance and repair must have appropriate qualifications required for this kind of work. The builder is responsible for organising in detail authority, responsibility and supervision of staff.

The operational safety of the system components supplied is only guaranteed in case of proper installation and correct use. Technical threshold values must not be exceeded.

Observe the accident prevention regulations and relevant standards and directives for installation, fitting, operation, maintenance and repair!

This includes (in extracts):

- Accident prevention regulations
 - Construction work BGV C22 (*Bauarbeiten BGV C22*)
 - Technical wastewater systems GUV-V C5 (*Abwassertechnische Anlagen GUV-V C5*)
- Safety regulations for working in enclosed spaces of technical wastewater systems GUV-R 126 (*Sicherheitsregeln für Arbeiten in umschlossenen Räumen von abwassertechnischen Anlagen GUV-R 126*)
- Handling biological working materials in technical wastewater systems GUV-R 145 (*Umgang mit biologischen Arbeitsstoffen in abwassertechnischen Anlagen GUV-R 145*)
- Directives for working in tanks and narrow spaces BGR 117 (*Richtlinien für Arbeiten in Behältern und engen Räumen BGR 117*)
- Standards
 - Excavations and trenches – Slopes, planking and strutting, breadths of working spaces DIN 4124
 - Construction and testing of drains and sewers DIN EN 1610
- Tool for safety and health protection in technical wastewater systems

WARNING

- Hazards from gases and vapours such as risk of suffocation, risk of poisoning and risk of explosion
- Risk of falling
- Risk of drowning
- Germ pollution and wastewater with sewage
- High physical and psychological stress during work in deep, narrow and dark spaces
- And others

DANGER

Non-compliance with the operating manual may result in considerable property damage, injury or death.

CAUTION

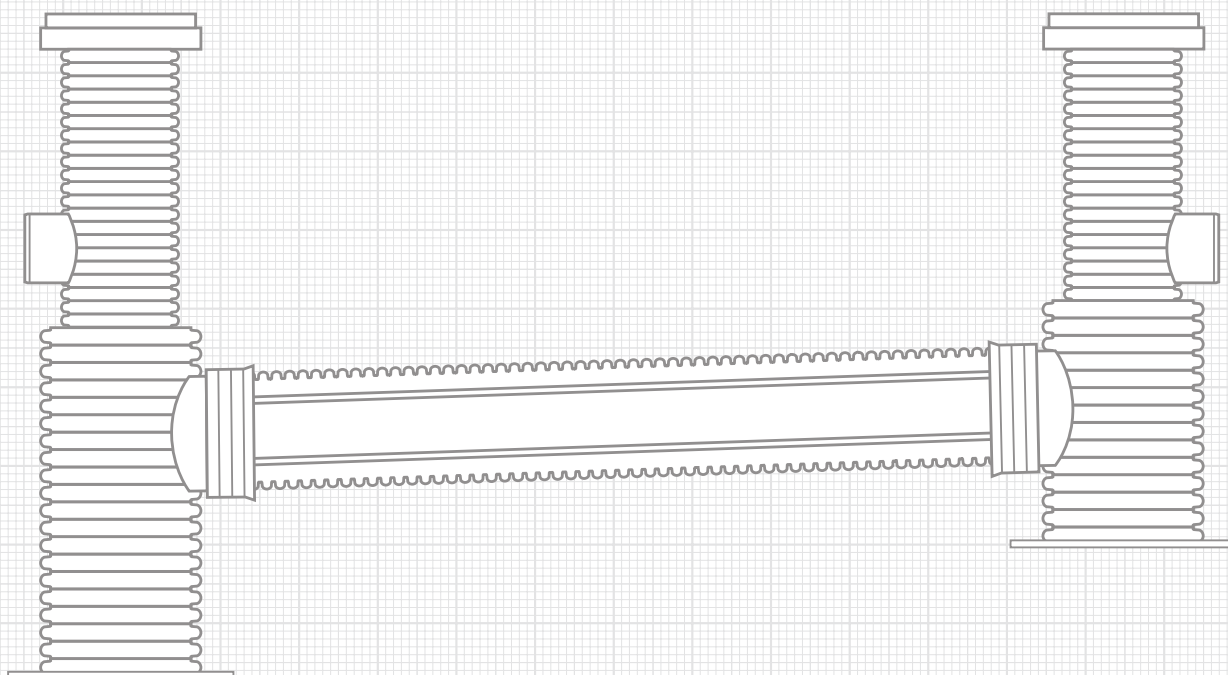
The system is part of an entire network. During installation, maintenance, service and repair work on one component, always consider the entire system. Avoid work during rain.

Changes or modifications to the system may only be carried out in agreement with the manufacturer. For safety reasons, use original spare parts and accessories approved by the manufacturer. The use of other parts voids the liability for any consequences arising therefrom.

General information on using our products and systems:

Information about or assessments of the use and installation of our products and systems is exclusively provided on the basis of the information submitted. We do not assume any liability for damage caused by incomplete information. If the actual situation deviates from the planned situation or if a new situation occurs or if different or new installation techniques are applied, these must be agreed upon with FRÄNKISCHE, since these situations or techniques may lead to different conclusions. Notwithstanding the above, the customer is solely responsible for verifying the suitability of our products and systems for the intended purpose. In addition, we do not assume any liability or responsibility for system characteristics and system functionalities when third-party products or accessories are used in combination with FRÄNKISCHE systems. We only assume liability if original FRÄNKISCHE products are used. For use in other countries than Germany, country-specific standards and regulations must also be observed.

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