Saudi Vitrified Clay Pipe Co.

Practical tips for laying V.C.Pipes professionally

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1. Unloading of the truck

- Pipes are to be checked on unloading. Possible damages must be
- reported on the delivery note. Checking can be done with talcum

- **a) <u>With crane or excavator</u>**
- Use lifting belts; chain or ropes may not be used.
- The lifting belts must be placed outside around the pallets and outside the base timber.

- Steer the pallets manually to prevent them colliding with anything.
- Do not move the pallets on the truck with the aid of levers or crowbars.
- Do not allow the pipes to be impacted by any hard object (e.g. crane hook, chain etc.).


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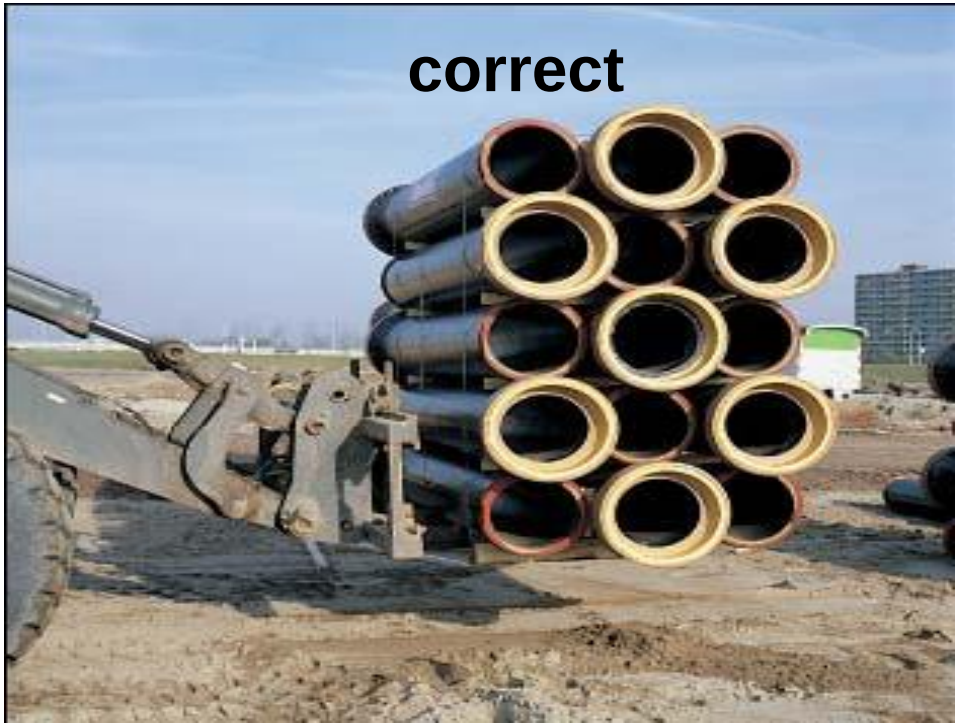
b) With forklift truck

- When placing the pallets transversely on the forks, make sure the forks are positioned sufficiently widely apart.



- When placing the pallets longitudinally on the forks, place protective timber between the parcel and the fork's base. Better is to transport the parcel in transversal direction on the fork teeth.

- When transporting individual pipes by sliding a tooth into a pipe, always have protective material between the forks and the pipe.

2. Storage on site

- Do not put the pallets down on to hard ground with a bang.
- Put the pallets down only on ground that is sufficiently hard to prevent the base timber sinking into it.
- Leave sufficient space between individual pallets.
- To avoid damage to the sealing elements, store individual pipes only on a wooden base.
- Store fittings standing upright on their sockets.

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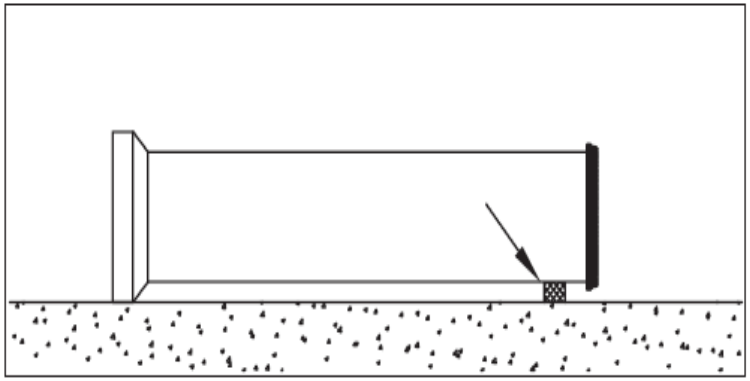

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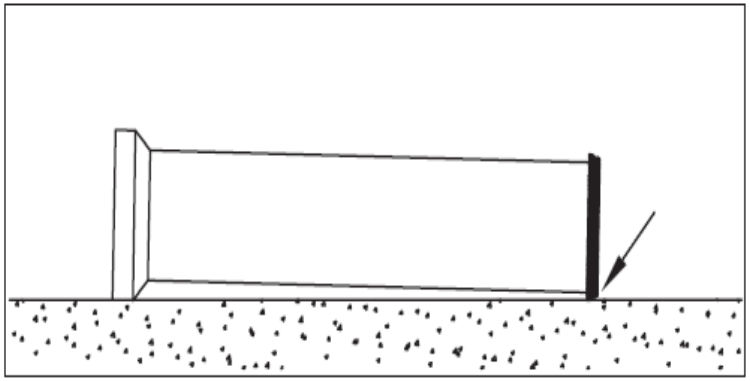

3. Transportation to the pipe trench

- Transport individual pipes with belts (mark on crown – yellow or white spot = centre of gravity– pipe hangs level).


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- Preferably transport complete pallets to the point of laying before opening them. Most pallets can be split up in two or three smaller pallets. (see table 1 in the catalogue; range of products or packing list).

- Put down the parcel on flat ground so that the pipes do not slip when the securing bands are cut.

3. Transportation to the pipe trench

- Never transport individual pipes in the excavator shovel.

4. Installation

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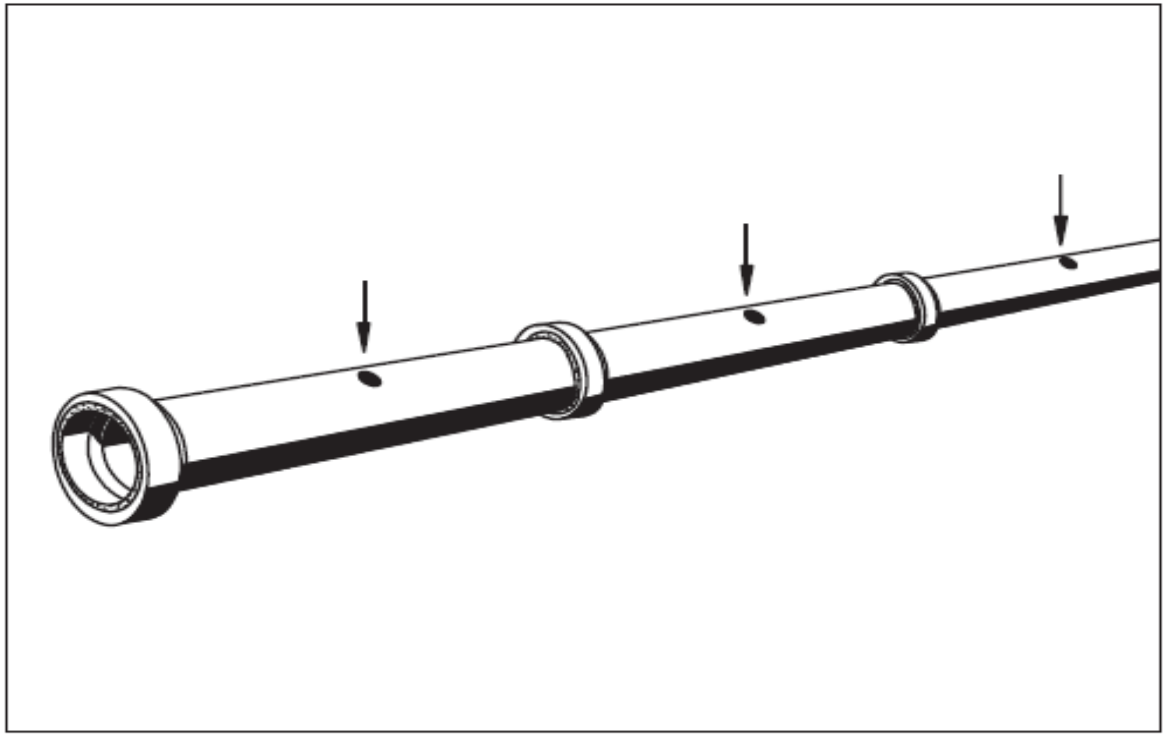
- Before the pipes are laid, check both ends of each pipe optically and internally with the aid of talcum powder in order to find any cracks that might have occurred in the course of transport.

- The paint mark must always point upwards. This ensures: * The pipe inverts will be level (any steps that might arise between two pipes will be within the permissible tolerance)

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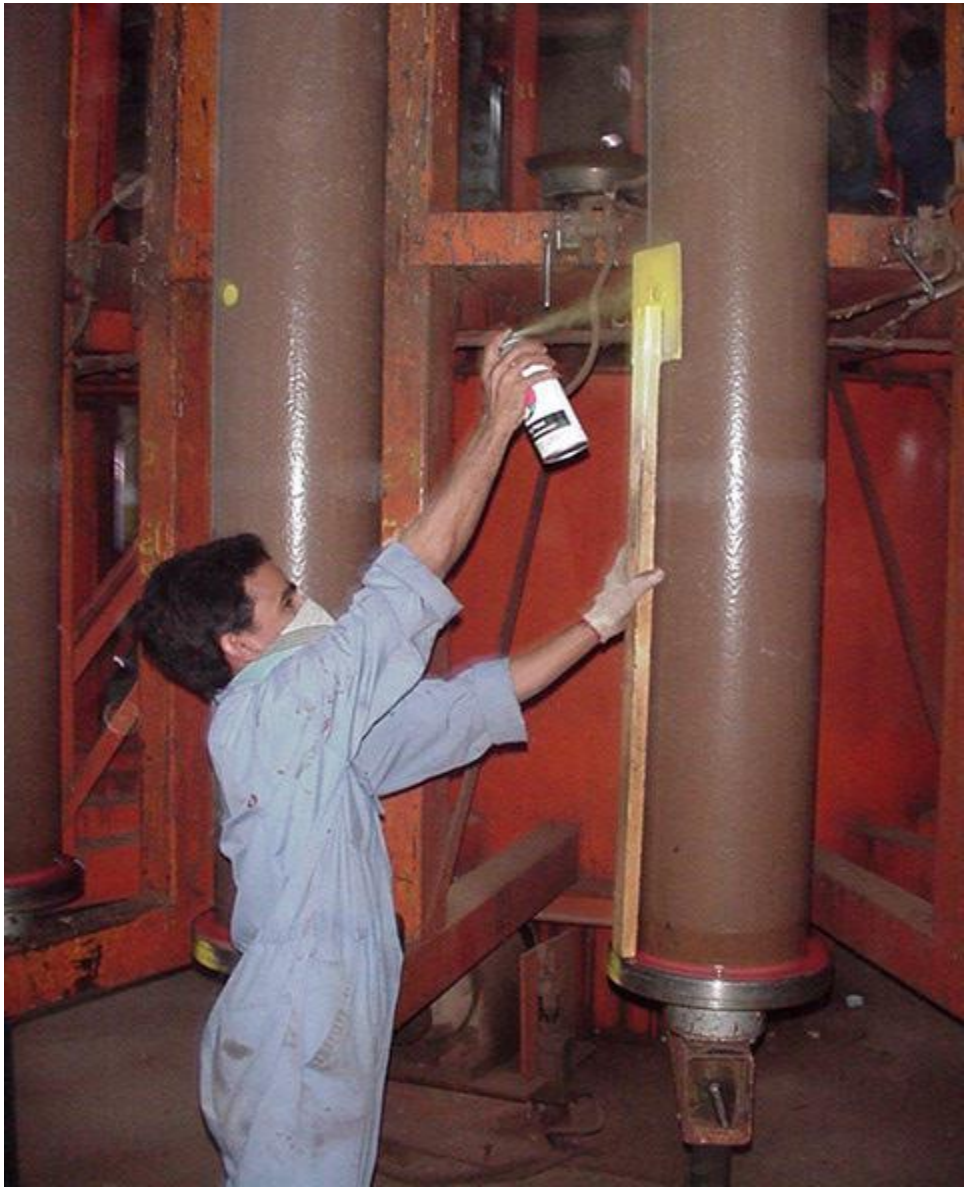
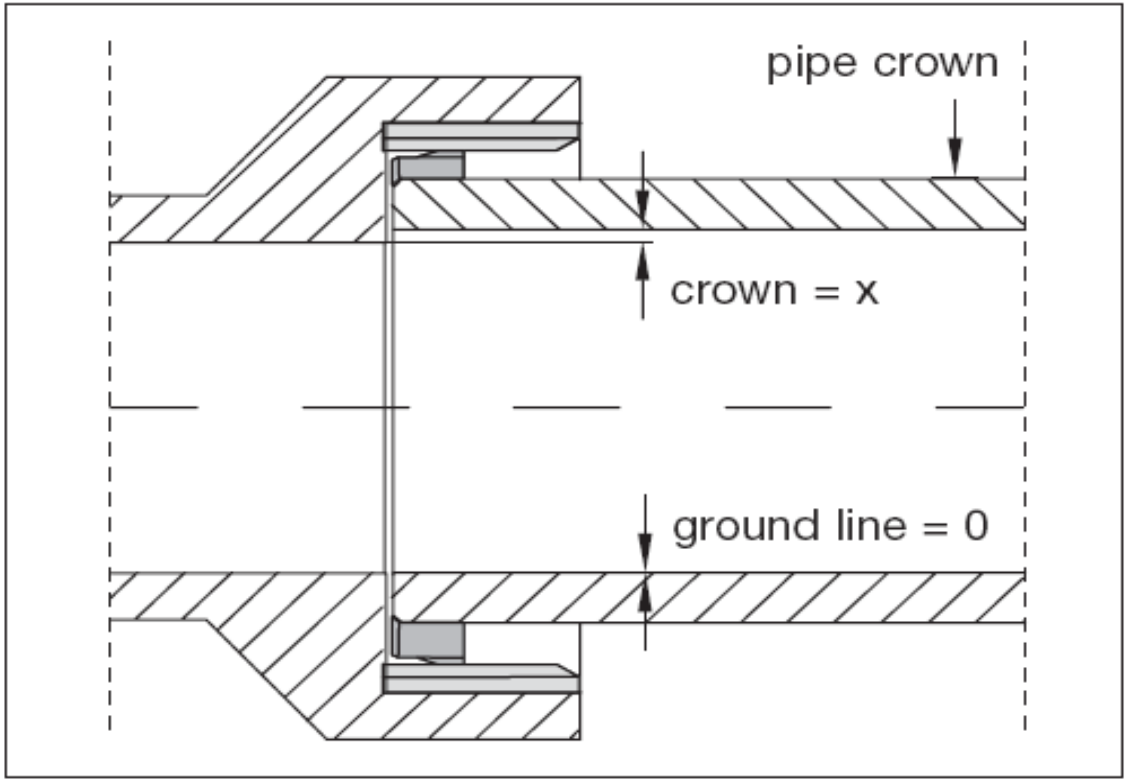
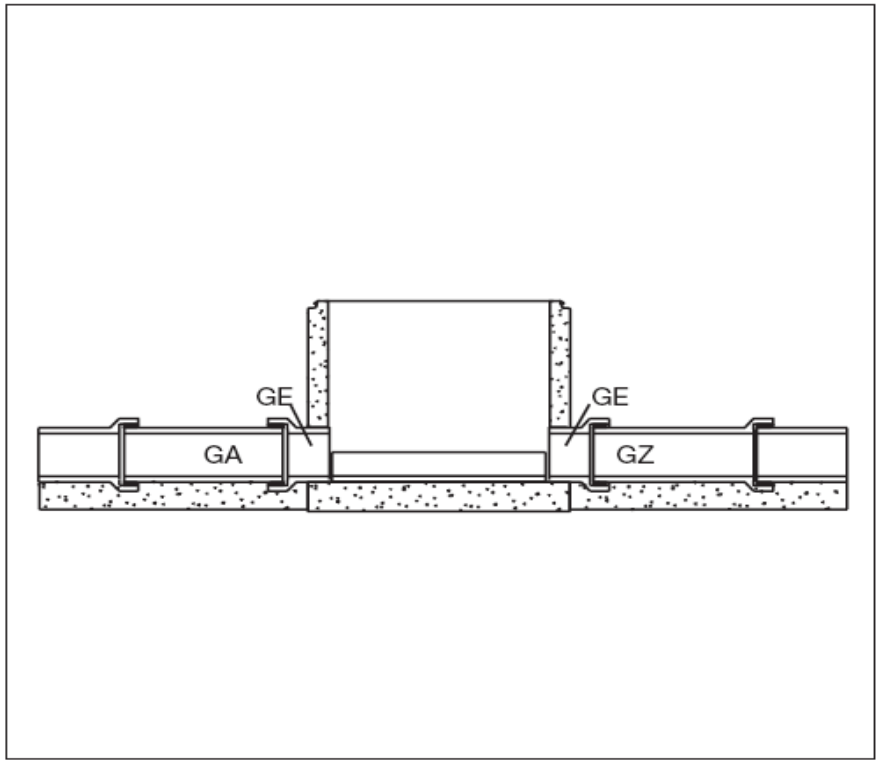


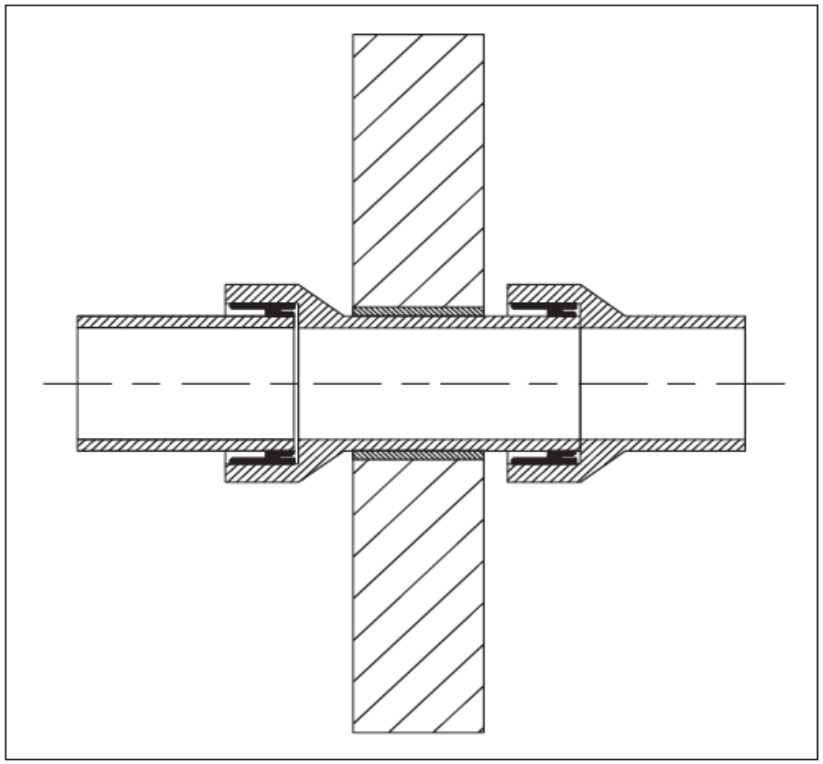
- * A possible small variance between two jointed pipes in the axial line will not lie in the flow zone. (Any small deviation of straightness will lay aside).



- The shape of the seals enables precentering to be carried out.
- First lubricant should be applied to the spigot and to the socket seal.

- Short lengths of pipe should be used at points where differences in settling are to be expected, e.g. in the region of shafts or at wall breakthroughs, in order to produce flexible connections.



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Pushing the pipes together with the crane bucket and a belt.(≥ DN 400)

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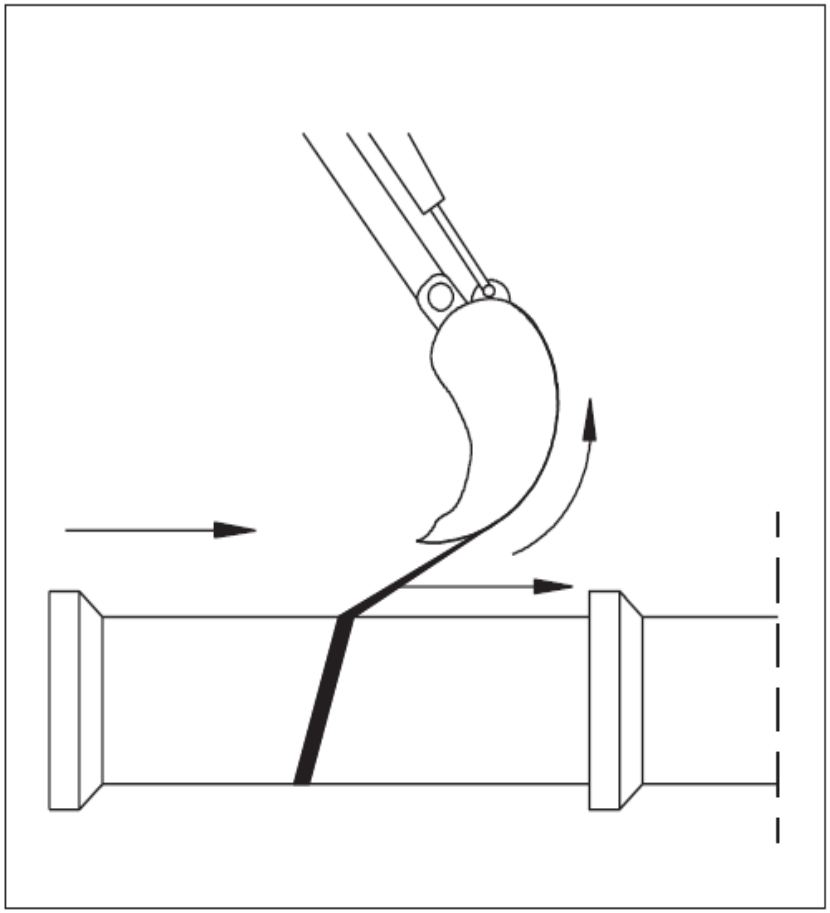

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- Pushing the pipes together with a crowbar – always have a piece of timber between the pipe and the crowbar (≤DN 400)
- Do not push against the pipe with the excavator shovel in order to correct the axial line.

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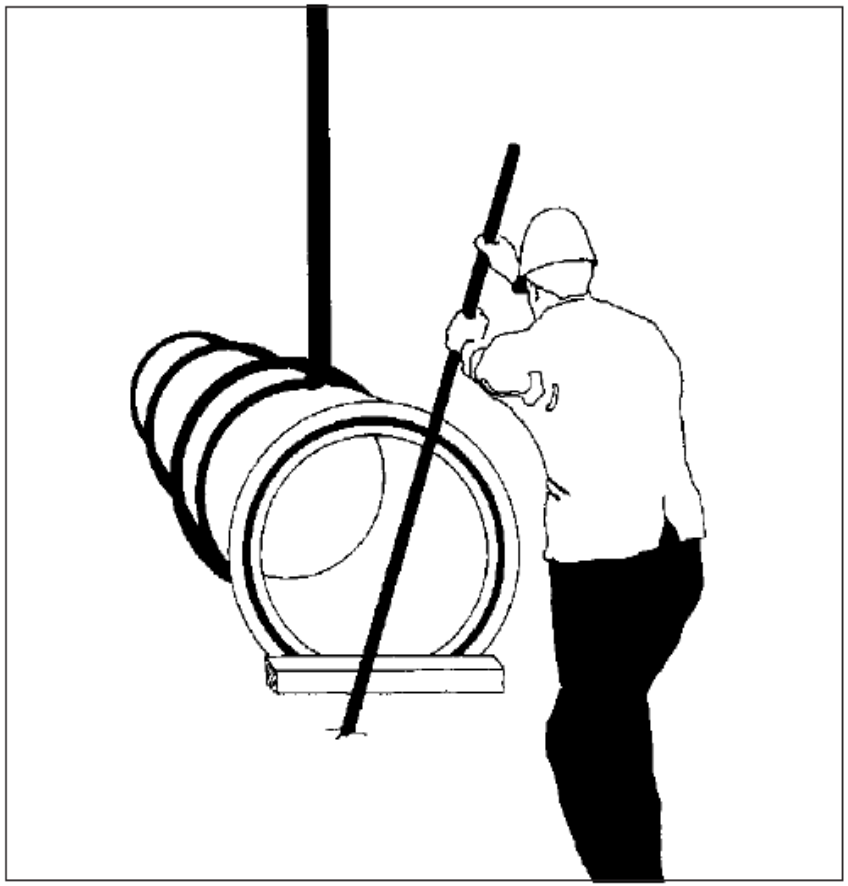


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-In a normal practice the sockets will point in the upside direction.

-Install pipes always in the centerline of the trench.

5. Excavation and compaction

- For the minimum required width of the trench (in accordance with nominal size and depth of laying), refer to EN 1610 for the laying of sewer pipes.
- A trench that is too narrow makes it difficult to compact the bedding zone properly. A trench that is too wide increases the laying costs and both increase the loading on the pipe.

- Minimum trench width, in relation to DN and in relation to depth

	Supported and unsupported trenches ($\beta > 60°$)	Unsupported trenches ($\beta \leq 60°$)
DN $\leq$ 225	OD + 0,40	OD + 0,40
DN 225-350	OD + 0,50	OD + 0,40
DN 350-700	OD + 0,70	OD + 0,40
DN 700-1200	OD + 0,85	OD + 0,40

depth	min. width
< 1,0	-
1,0-1,75	0,80
1,75-4,0	0,90
> 4,0	1,0

OD = external pipe diameter (see d_3 in the catalogue; "range of products)

- Socket holes must be made so that the sockets do not lie on a compacted bottom; this would result in point loading. Support must be provided over the whole barrel length.

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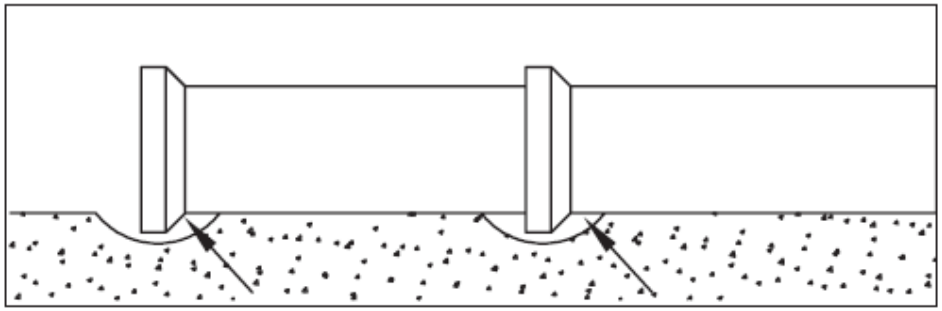

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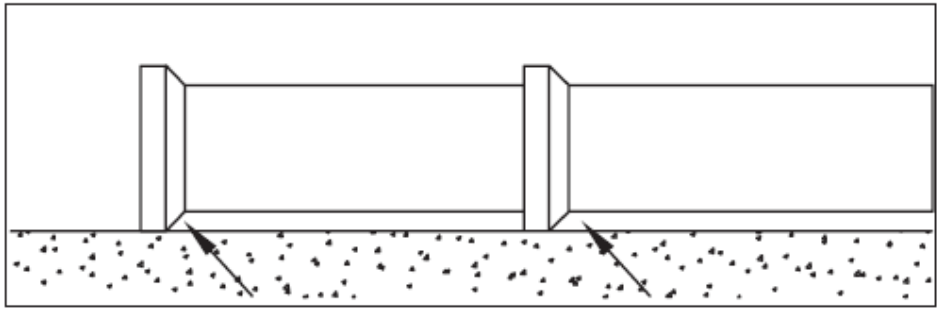
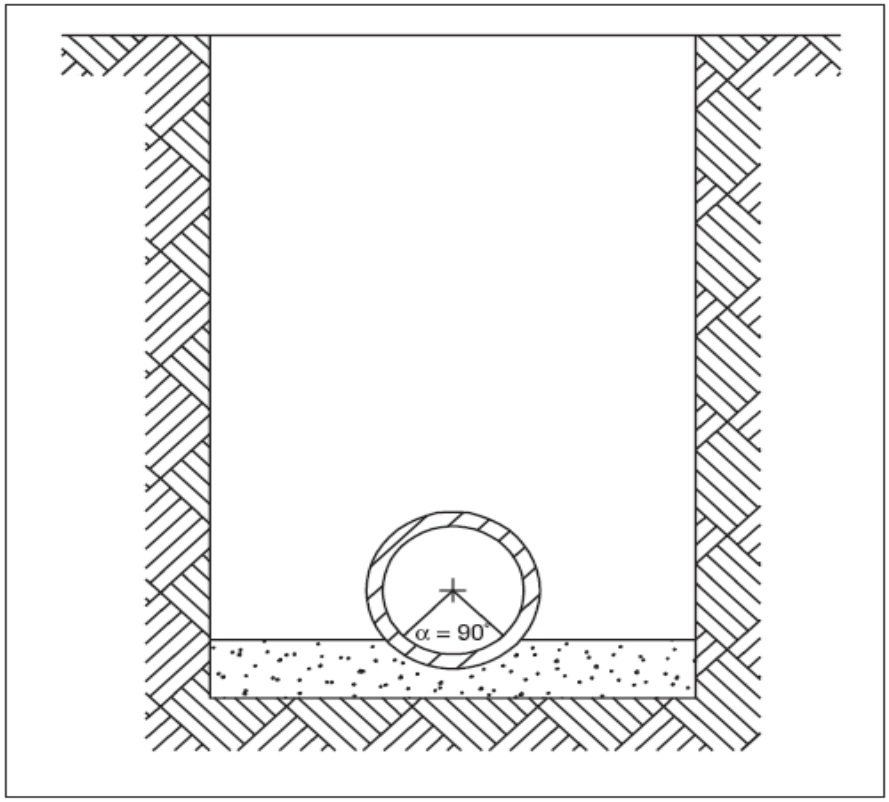
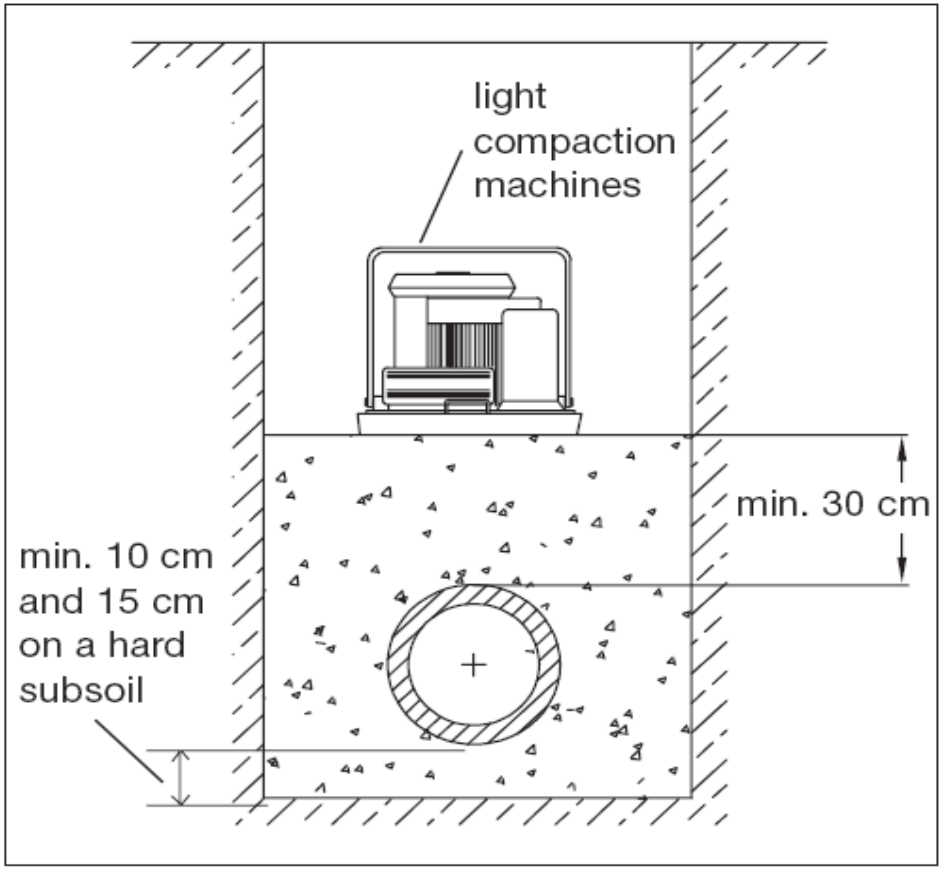




Between the trench bottom and the pipe a bedding angle of at least 90° must be realized with materials that can be compacted well.

- The backfilling directly above the pipe and to a width equal to the outside diameter of the pipe should be compacted by hand where required. Mechanical compaction of the main backfill directly above the pipe should not be commenced until there is a total depth of cover at least 300 mm above the top of the pipe. This layer must consist of stone free soil.



- The selection of the compacting device, the number of passes and the thickness of the layer to be compacted should match the backfill material.

- If the layer above the pipe is inadequately thick (less than 30 cm), do not move the compactor over the pipeline.

- When compacting at the sides of the trench, ensure that the compactor does not contact the pipes. Similarly do not run the compactor over the pipes.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6. Accessories

- **P-rings**

  SBR-rubber-seal to replace the spigot seal when pipes are cut-to length or when the spigot seal is damaged.

- **B-rings**

  Sealing elements used in connection with the branch piece for lateral connections.

- **U-RING**

Used to connect V.C

Pipe socket to C.I / PVC

Pipes spigot (DN100-200)

- **M sleeves**

  Sleeve type seals for connecting two spigots of vitrified clay pipes or fittings. (Mainly for repairs).

- **Lubricant**

  Is applied to all sealing elements to facilitate the jointing of pipes and fittings.

- **Cutting devices**

  Cutting rings and cutting chains for cutting vitrified clay pipes.

7. Test with water: EN 1610

- Testing for leak tightness of pipelines, manholes shall be conducted either with water or with air after backfilling of the trench.
- With a water test the pressure is equivalent to filling the section up to the ground level of the downstream or upstream manhole, as appropriate, with a minimum of 10 and a maximum of 50 kPa (0,5 bar = 5m water column) at the top of the pipe.

- A conditioning time of 1 hour at the test pressure before testing should be applied. The testing time shall be 15 ± 1 minutes. Pressure shall be maintained within 1 kPa of the specified test pressure. The total amount of water added during the test to achieve this pressure requirement (W15) shall be measured and recorded and not be higher than:
- - 0,07 l/m² during 15 min, for pipelines
- - 0,20 l/m² during 30 min. for pipelines including manholes
- - 0,40 l/m² during 30 min. for manholes.

- Important points observe:
- * stoppers should be adequately secured;
- * during the filling period the line should be vented.

8. Air test

- To be conducted after backfilling.
- 4 testing methods with different pressure heights P0 are allowed. (LA, LB, LC and LD)
- The testing times for pipelines, excluding manholes and permissible pressure losses Δp are given in the table in relation to pipe size.

To avoid errors following points should be taken into account:

-use suitable airtight plugs;

-an initial pressure approximately 10% in excess of the required test pressure P0 shall first be held for 5 minutes (until DN 500) and for a time equal to DN/100 in minutes for DN > 500;

-the equipment shall allow high accuracy measurements; at least within 10% of Δp for the pressure and 5 seconds for the time;

- temperature variation influences the measurement.


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method	P_0 mbar	Δp mbar	Testing in minutes for diameters specified														
			100	125	150	200	225	250	300	350	400	450	500	600	700	800	1000	1200
LA	10	2,5	5	5	5	5	5,5	6	7	8	9,5	11	12	14,5	17	19,5	24	29
LB	50	10	4	4	4	4	4	5	5,5	7	7,5	8	9	11	13	15	18,5	22
LC	**100**	**15**	**3**	**3**	**3**	**3**	**3**	**3,5**	**4**	**5**	**5,5**	**6**	**7**	**8**	**10**	**11**	**14**	**16**
LD	200	15	1,5	1,5	1,5	1,5	1,5	2	2	2,5	2,5	3	3	4	5	5	6	8

The test recommended by SVCP is the test LC with a test pressure of 100 mbar.

- In the case of a negative result and where the cause of the fault cannot be detected unambiguously, a water pressure test must be carried out in conclusion and is then decisive for the evaluation.

- It is essential that the safety regulations are maintained (No persons near to the stoppers!).