EUROPEAN NO•DIG 2023 Conference ITALY

PRIMUS LINE

Design and operating guidelines for the trenchless rehabilitation of sewer pressure pipelines using lining with inserted hoses

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25th May 2023

Content

Introduction: Definition of sewer pressure pipes and the Primus Line® system

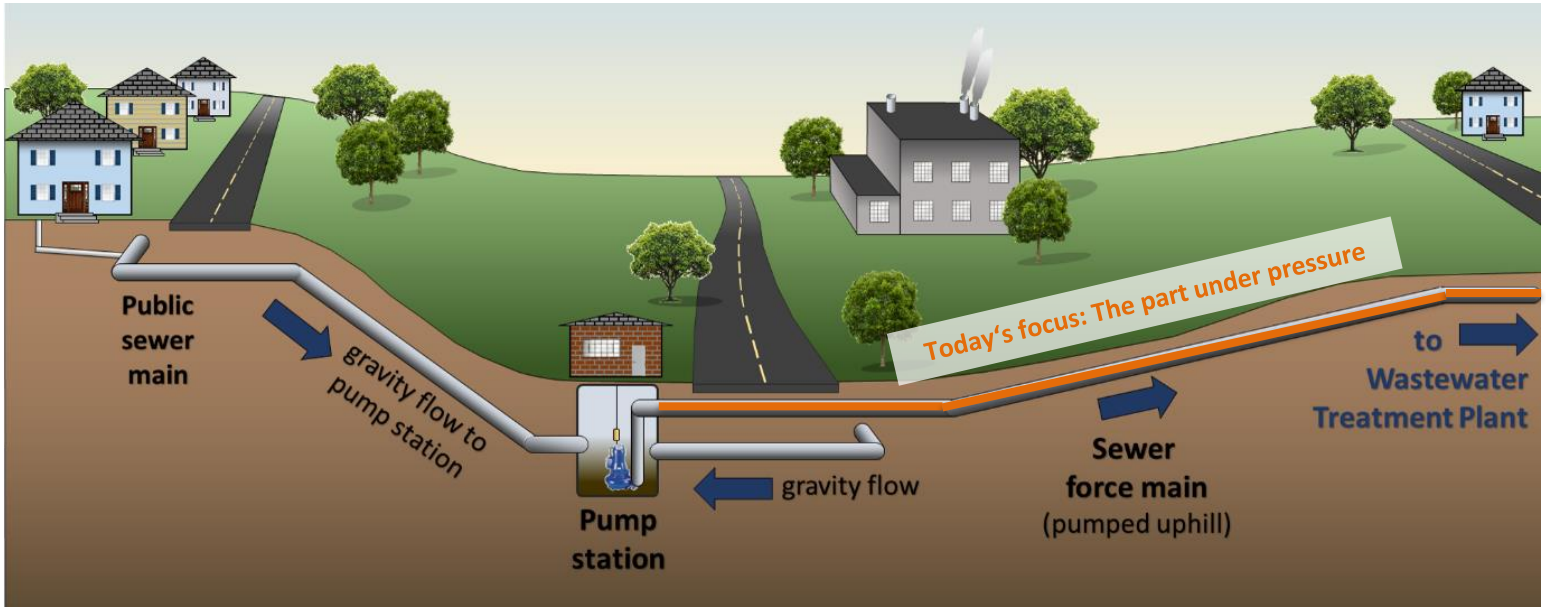
Design & operations guidelines when using lining with inserted hoses in sewer pressure pipelines:

- No free in- and outlet for constant flow velocity
- Always filled with transported fluid
  - Non return valve
  - Longitudinal profile
- Installation of pressure release valve for annular space management
- Engineered solutions to modify pipelines to meet the guidelines

Case studies:

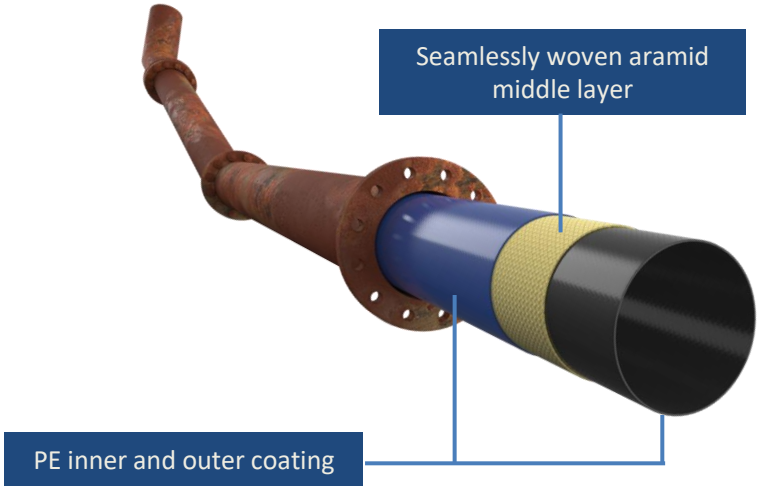
- A sewer siphon under the river Havel in Brandenburg, Germany
- A sewer pressure pipeline under a railway station in Copenhagen, Denmark
- A sewer rising main with many bends at Lake Windermere, United Kingdom

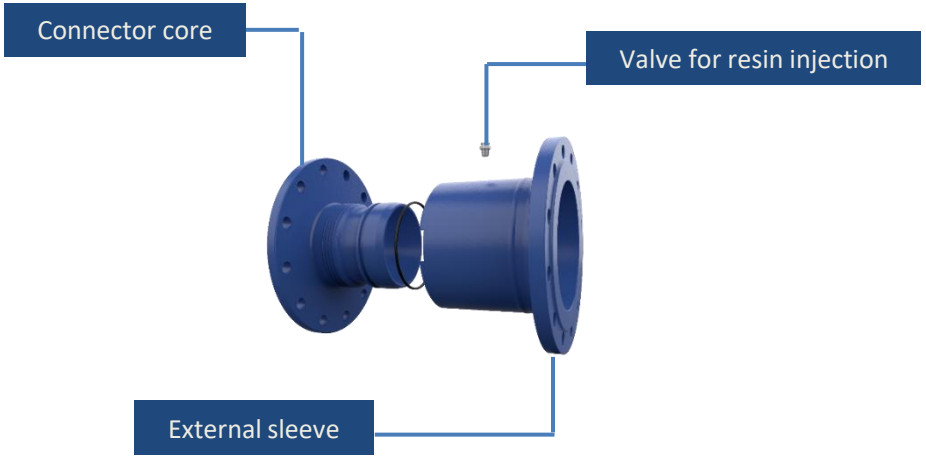
A Typical sewer network with typical failures



Solution: Trenchless rehabilitation using inserted hoses like

PRIMUS LINE





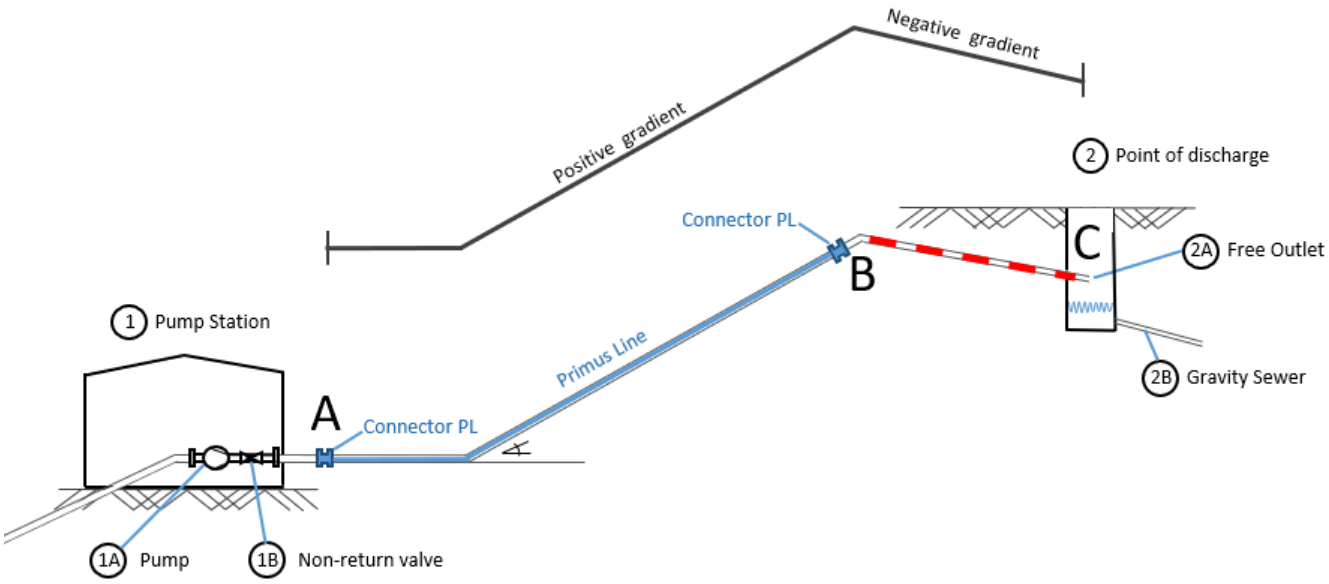
Design & operations guidelines

- **No free in- and outlet** for constant flow velocity

- **Always filled with transported fluid** - Non return valve:

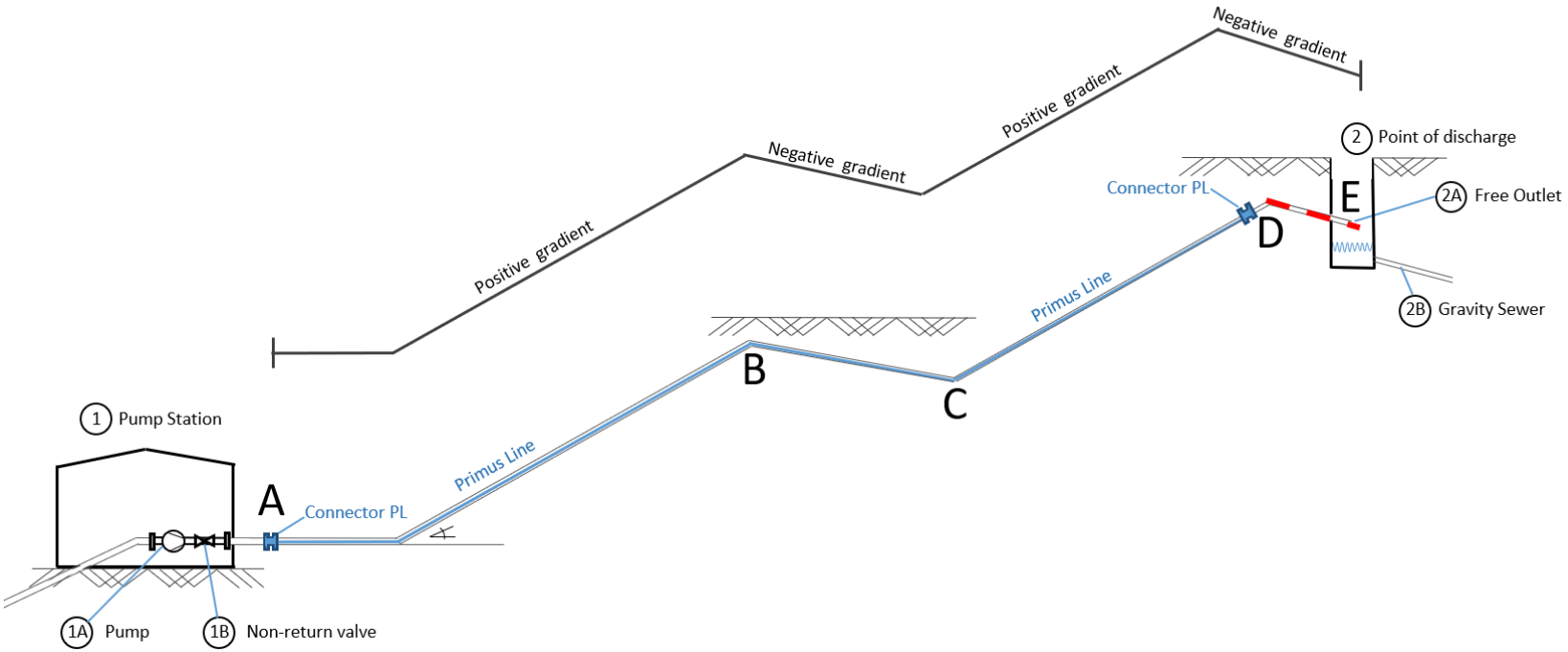
Design & operations guidelines

- **<u>Always filled with transported fluid</u>** – Longitudinal profile



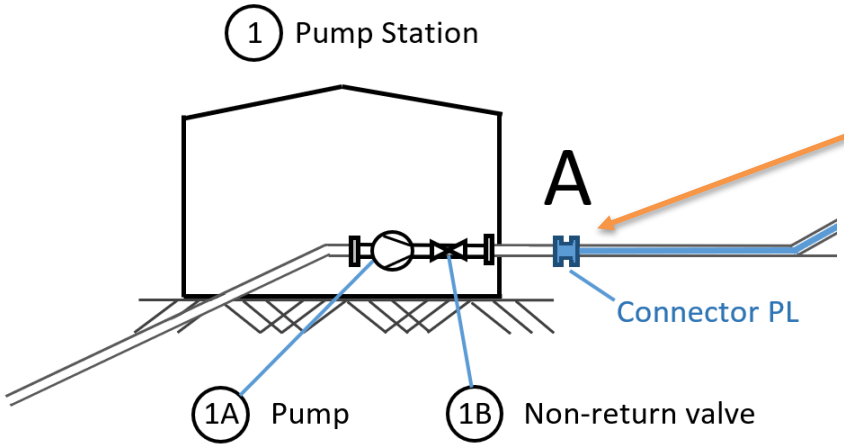
Design & operations guidelines

- **<u>Always filled with transported fluid</u>** – Longitudinal profile



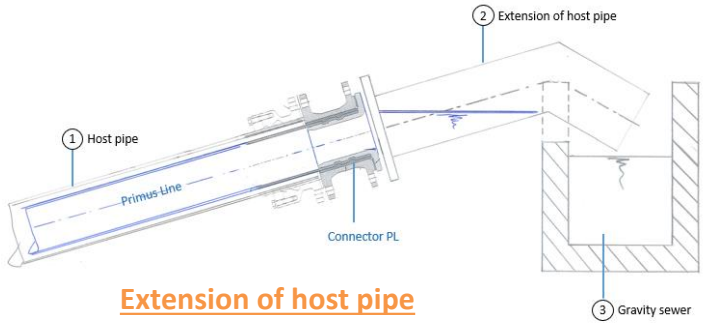
Design & operations guidelines

- Installation of **pressure release valve** for annular space management

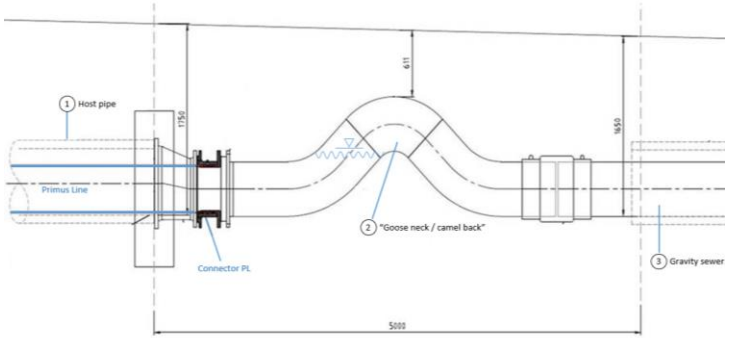


Design & operations guidelines

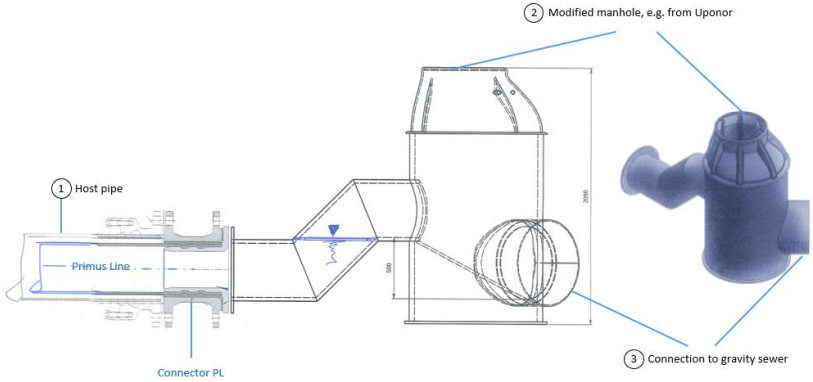
- **Engineered solutions** to modify pipelines to meet the guidelines



Extension of host pipe



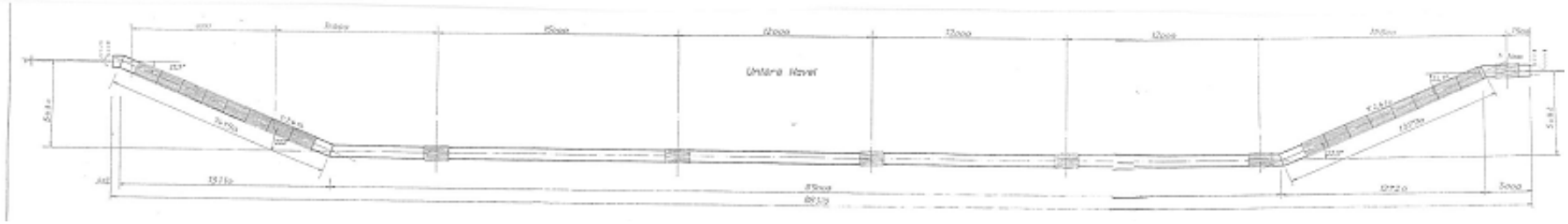
Goose neck / Camel back



Modification of receiving manhole

Case Studies

- **<u>Renovation of a 93m long sewer siphon</u>** under the river Havel, Germany (2013)



Project data:

- DN700 steel pipe with 4 bends of 22.5 degree
- 10 bar operating pressure
- Installation of a DN500 PN17 Primus Liner

Checklist Design & operations guidelines:

- No free in- and outlet for constant flow velocity ✓
- Always filled with transported fluid ✓
- Engineered solutions **Not needed**

Case Studies

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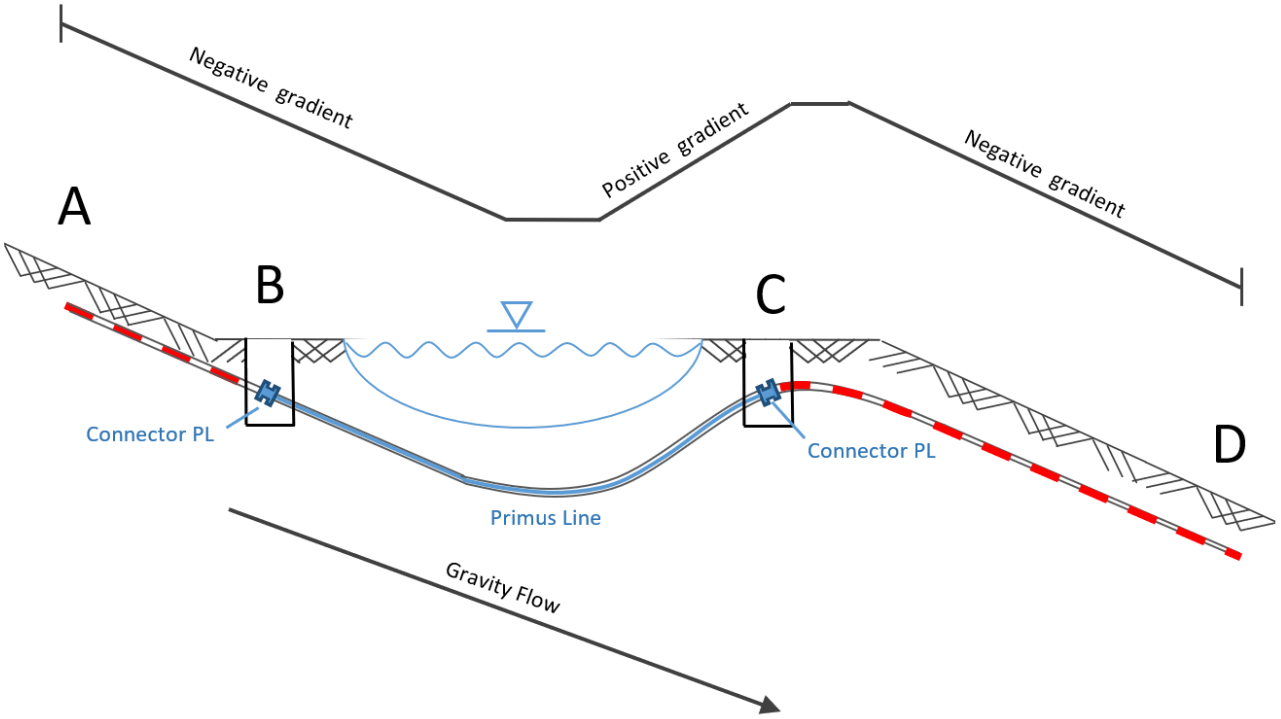
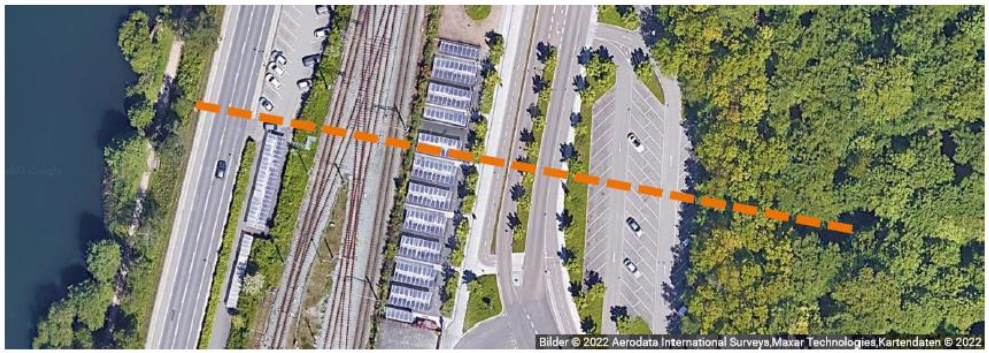


Case Studies

- **<u>Rehabilitation of a 165m long DN500 sewer pressure pipeline</u>** at Holte train station, Denmark



Project data:

- DN500 PE SDR17 pipeline under a street and several rails as well as a parking lot
- 1.7 – 2.7 bar operating pressure
- Installation of a DN450 PN16 Primus Liner

Checklist Design & operations guidelines:

- No free in- and outlet for constant flow velocity ✓
- Always filled with transported fluid ✓
- Engineered solutions **Not needed**

Case Studies

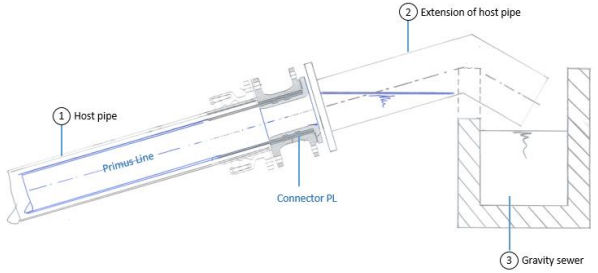
- **<u>Renovation of a 770m long DN300 SRM with several bends</u>** at Lake Windermere, UK

Project data:

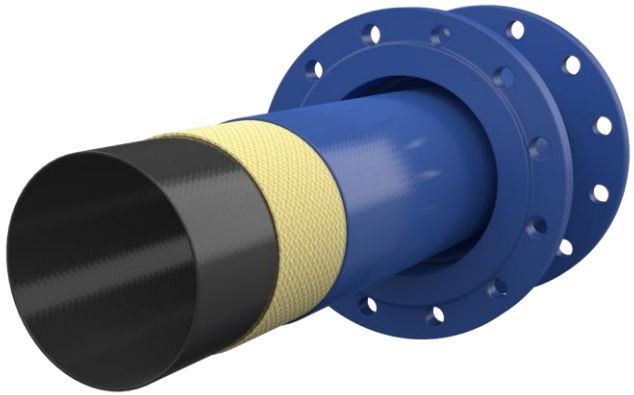
- DN300 cast iron pipeline with bends up to 45 degree
- Operating pressure
- Installation of a Primus Liner DN 300 PN 12

Checklist Design & operations guidelines:

- No free in- and outlet for constant flow velocity ✓
- Always filled with transported fluid ✓
- Engineered solutions **Extension of the host pipe**



Thank you for your attention



For more information visit **our stand 43-45-47** or **www.primusline.com**