

1



3



2



4

**TRACTO**

## AGENDA

1. INTRODUCTION | TRACTO, PRODUCTS, APPLICATIONS
2. WHEN TO CONSIDER PIPE BURSTING
3. PRODUCT AND PROCESS OVERVIEW
4. RELATED TECHNOLOGIES | Pipe Reduction Method

**TRACTO**

5

## PRODUCT OVERVIEW



5 7 TRACTO UK | ROGER WAHL

**TRACTO**

7

## ABOUT US

- FAMILY-OWNED COMPANY WITH HQ IN GERMANY
- SISTER COMPANIES IN USA, UK, AUS, FR, CH, MAR
- ESTABLISHED IN 1962
- 600 EMLPOYEES WORLDWIDE
- 120 MIO EURO TURNOVER

### WHAT IS OUR MAIN FOCUS?

- PROVIDING SOLUTIONS FOR TRENCHLESS INSTALLATION AND REHABILITATION OF UNDERGROUND INFRASTRUCTURE

**TRACTO**

4 TRACTO UK | ROGER WAHL

6

## RENOVATION, REINSTATEMENT, RENEWAL

### TRENCHLESS METHODS

- All techniques have their place
- All have their advantages and disadvantages
- All techniques offer specific unique propositions others can't offer

➤ **SELECT THE RIGHT ONE!**

5 8 TRACTO UK | ROGER WAHL

**TRACTO**

8

# WHEN TO CONSIDER PIPE BURSTING

What do I want to achieve?

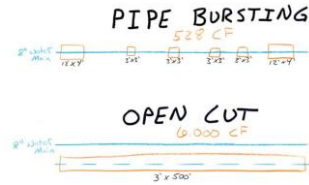


**TRACTO**

9

## WHY TRENCHLESS? JUST LESS EXCAVATION?

PIPE BURST VS OPEN CUT EXCAVATION – COMPARISON REPLACING WATER MAIN\*



\* SOURCE: TOD GRAFENAUER, VICE PRESIDENT MURPHYS PIPELINES, US, IN TRENCHLESS TECHNOLOGY MAGAZINE, 14-09-2020

5 11 TRACTO UK | ROGER WAHL

**TRACTO**

11

### ➤ What do I want to achieve?

- Reduced leakage/seepage?
- Improved hydraulic performance?
- Increased capacity?
- Re-establishing static parameters?
- Re-alignment?

### ➤ Any 'YES', bursting should be considered

5 10 TRACTO UK | ROGER WAHL

**TRACTO**

10

### ➤ Simple Model Check-List

1. Host pipe dimensions (ND, OD, ID) profile (round, oval)? Host Pipe Material?
2. Proposed pipe dimensions of new pipe? New Pipe Material?
3. Position and course? Bends, branches, lateral connections, walkway/road?
4. Depth of existing pipe?
5. Adjacent infrastructure?
6. Surrounding ground conditions? Bedding of existing pipe?
7. Soil conditions? Water table?
8. Location (site access, pipe layout arrangements)? Pit arrangements? Manholes?
9. Reason for replacement? Cracks, Corrosion, Deformation, Breakage?
10. Previous repairs/rehabilitation?
11. Inspection possible? CCTV?
12. Permits?

5 12 TRACTO UK | ROGER WAHL

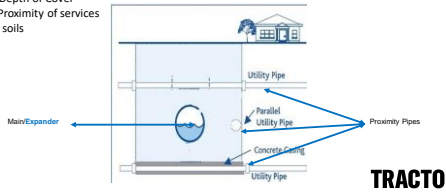
**TRACTO**

12

## Depth of Cover and Proximity of Services

**Rules of Thumb:**

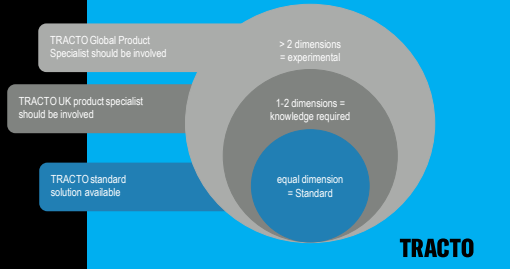
1. Take the difference between Expander OD and Existing pipe ID
2. times 10 for Depth of Cover
3. Times 5 for Proximity of services
4. Displaceable soils



**TRACTO**

13

## POSSIBLE APPLICATIONS AND LIMITS



**TRACTO**

15

## Depth of Cover and Proximity of Services

**Example 1: Size for Size 4" ND**

- 4" ND (= 102mm ID): 140mm expander, so
  - ✓ 10 x 38mm depth of cover = 380mm
  - ✓ 5 x 38mm proximity – 190mm

**Example 2: 50% Upsize 4" to 6"**

- 6" = 195mm expander, i.e. 195mm – 102mm = 93mm
  - ✓ 10 x 93mm depth of cover = 930mm
  - ✓ 5 x 93mm proximity – 465mm

**TRACTO**

14

# TRACTO SOLUTIONS

FOR PIPE RENOVATION

**TRACTO**

16

➤ **TRACTO BURSTING SOLUTIONS FOR**

- INSTALLING PIPES WITH SAME DIAMETER
- INSTALLING PIPES WITH LARGER DIAMETER
- INSTALLING PIPES WITH SMALLER DIAMETER

5 17 TRACTO UK | ROGER WAHL

**TRACTO**

17

**MACHINE OVERVIEW GRUNDOBURST**

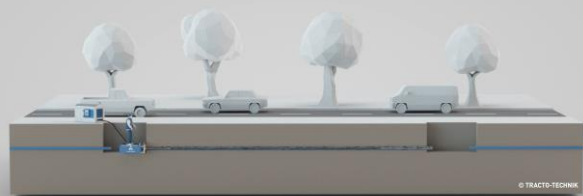


5 19 TRACTO UK | ROGER WAHL

**TRACTO**

19

**STATIC PIPE BURSTING**



© TRACTO-TECHNIK

**TRACTO**

18

**PIPE MATERIALS STATIC BURSTING**

OLD PIPE MATERIALS	NEW PIPE MATERIALS
<ul style="list-style-type: none"> <li>- Stoneware</li> <li>- Concrete</li> <li>- Reinforced concrete</li> <li>- Grey cast iron</li> <li>- Ductile iron</li> <li>- Asbestos cement</li> <li>- Pitch Fibre cement</li> <li>- PE</li> <li>- PP</li> <li>- PVC</li> <li>- Glass fibre reinforced plastics (GRP)</li> <li>- Steel</li> <li>- Liner</li> <li>- PA12</li> </ul>	<ul style="list-style-type: none"> <li>• PE (short or long/continuous)</li> <li>• PP</li> <li>• PVC</li> <li>• Glass fibre reinforced plastics (GRP)</li> <li>• Ductile iron</li> <li>• Steel</li> <li>• PA12</li> <li>• Stoneware</li> <li>• Concrete</li> </ul>

5 20 TRACTO UK | ROGER WAHL

**TRACTO**

20

### BURST HEADS – CUTTING KNIFES



5 21 TRACTO UK | ROGER WAHL

**TRACTO**

21

### TYPICAL SETUP STATIC PIPE BURSTING

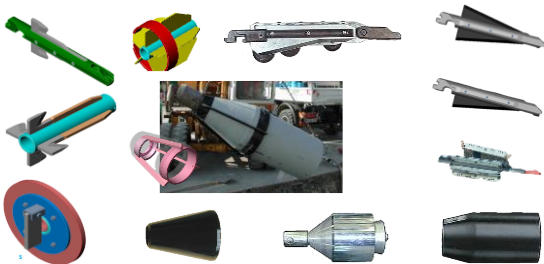


5 23 TRACTO UK | ROGER WAHL

**TRACTO**

23

### WIDE RANGE OF INTERCHANGEABLE ACCESSORIES TO SUIT ALL PIPE MATERIALS



5

22

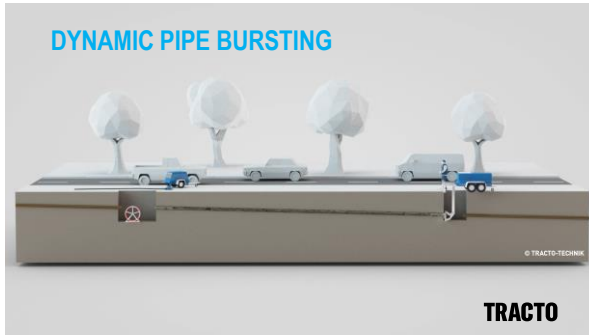
### Quick-Lock Rods

- QuickLock rods when clicked together form a natural flexible bend radius chain which negotiate around offset pipe bends
- For example, here a 10m length of QuickLock Rods connected together form a natural 1.5m sideways movement in between all total joints when taken up, with no stress whatsoever on the rod string, because each Quick-lock Rod joint has been machine designed with a 1-2 degree off-set tolerance to allow for a bending movement.
- You cannot achieve the same with a screwed rod string where bent rods are regularly seen when pushing round existing pipe bends (usually) over approx. 22 degrees or greater.

5 24 TRACTO UK | ROGER WAHL

24





25

## PIPE MATERIALS DYNAMIC BURSTING

OLD PIPE MATERIALS	NEW PIPE MATERIALS
<ul style="list-style-type: none"> <li>• Concrete</li> <li>• Reinforced concrete</li> <li>• Stoneware</li> <li>• Grey cast iron</li> <li>• PVC</li> <li>• Asbestos cement</li> <li>• Pitch Fibre cement</li> </ul>	<ul style="list-style-type: none"> <li>• PE (short and long/continuous)</li> <li>• PP</li> <li>• PVC</li> <li>• Steel</li> <li>• PA12</li> </ul>

5 27 TRACTO UK | ROGER WAHL

TRACTO

27

## MACHINE OVERVIEW GRUNDOCRACK



GRUNDOCRACK	PCG 130		PCG 180		PCG 200		PCG 260		PCG 350	
	METRIC	IMPERIAL	METRIC	IMPERIAL	METRIC	IMPERIAL	METRIC	IMPERIAL	METRIC	IMPERIAL
Machine Ø mm (in)	130	5.1	180	7.1	200	8.2	260	11.0	360	15.0
Length (mm / in)	1.800	57.5	1.700	66.9	2.100	82.7	2.300	90.2	2.750	107.5
Weight (kg / lbs)	95	209.4	230	507.1	395	870.8	615	1.355.8	1.180	2.601.5
Upsetting Ø mm (in)	280	11.0	392	15.4	480	17.7	660	22.0	630	24.8
Flow pipe Ø3 (mm / in)	215	8.9	315	12.4	395	14.0	480	17.7	560	22.0
No. of strokes (mm <sup>2</sup> )	320	830	280	290	290	310	310	220	220	220
Air consumption (m <sup>3</sup> /min / cfm)	2.7	95	4.5	159	6.5	230	12	424	20	706
with blade head	x		x		-		-		-	
with pulling eye	-		x		x		x		x	

5 28 TRACTO UK | ROGER WAHL

TRACTO

26

## DYNAMIC PIPE BURSTING – MANHOLE APPLICATION



5 28 TRACTO UK | ROGER WAHL

TRACTO

28

## TENSILE FORCE DATA-LOGGING

Depending on asset owner requirements, pulling forces on the new pipe may require measuring and logging

- GRUNDOLOG load-cell and data logger can be installed to measure and record actual pulling forces during installation

5 29 TRACTO UK | ROGER WAHL



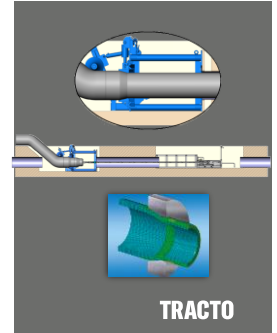
29

## PIPE REDUCTION

### INSTALLATION OF PIPES WITH A SMALLER DIAMETER

- Host pipe need to be in reasonable condition (statics intact)
- Diameter Reduction during pulling action (only elastic)
- When in-situ, 'memory effect' aims to restore original diameter
- Host and new pipe end-up CLOSE-FIT
- Types of damages: corrosion, cracks, leakage, mechanical wear, encrustation (to be removed beforehand).

5 31 TRACTO UK | ROGER WAHL



31

## RELATED TECHNOLOGIES

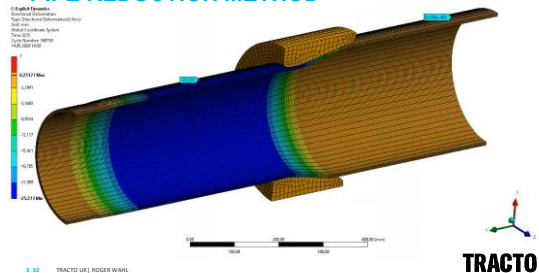
FOR PIPE RENOVATION



TRACTO

30

## PIPE REDUCTION METHOD



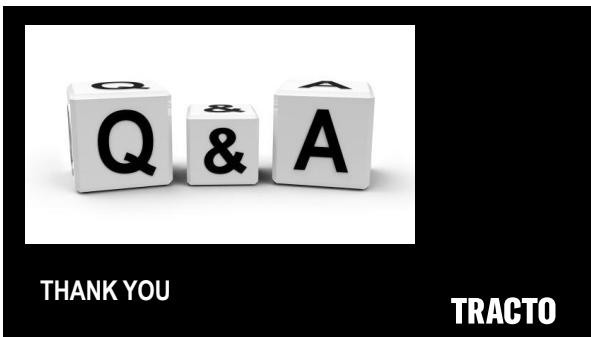
5 32 TRACTO UK | ROGER WAHL

32





33



34