

2021
TRENCHLESS
MIDDLE EAST

A REVIEW OF MECHANICAL AND WATER POWERED CLEANING SYSTEMS FOR SMALL AND LARGE DIAMETER PIPE NETWORKS

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WHY?



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PIPE CLEANING METHODS

- Rodding
- Electro-Mechanical
- High Pressure Water Jetting (HPWJ)



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RODDING / PLUNGING

Benefits

- Portable – no access problems
- Can work from upstream without causing flooding

Limitations

- Rods can get stuck!
- Care needed not to unscrew the rods during work
- Removing debris takes time
- Pushing too hard can crack bends and traps



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ELECTRO-MECHANICAL


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Benefits

- Portable – no access problems
- Works from upstream without flooding
- Breaks up blockages
- Works well through bends
- No water required

Limitations


- Low speed (200 to 500 RPM)
- Takes time to descale pipes
- Operator has to hold rotating flexible shaft
- Flexible shaft can snake up inside the pipe and then unwind around the operator's hand, resulting in serious injury



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HIGH-SPEED CLEANING

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HIGH PRESSURE WATER JETTING



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Benefits

- Quick and effective for breaking up blockages
- Ultra-High machines can cut through steel!

Limitations

- Requires a good supply of water
- If used incorrectly can cause the pipe to collapse
- Not suitable for use within buildings
- Can create additional flooding
- Operatives need to be trained to minimise risk of damage and injury

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PICOTE HIGH-SPEED CLEANING

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- Developed in 2010
- Suitable for pipe diameters DN32 to DN300
- Rotation Speeds from 500 RPM to 2900 RPM
- Shaft Diameter - 8mm to 18mm
- Flexible steel shaft housed inside an outer casing
- Tools are connected onto the internal steel shaft
- Operator feeds shaft through the pipe to clean & restore flow
- Descaling pipes, root cutting, blockage removal, FOG's, failed linings, concrete removal, reinstating lateral connections after lining



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HIGH-SPEED CLEANING





Pre-Cleaning



Post-Cleaning

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ROOT CUTTING / DUBAI



SPECIAL DRILL HEAD WITH DN100 ORIGINAL PREMIUM CHAIN



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DESCALING HEAVY SILICATE DEPOSITS / UK



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HOTEL COMPLEX / DUBAI




CLIENT:
BLUE HAT MIDDLE EAST
SUPPORT:
PICOTE UK
OPERATION:
CONCRETE CUTTING

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PICOTE MAXI POWER+



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TWISTER CONCRETE REMOVER+

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WHAT DID WE DISCOVER?




- The leading taper of concrete free in the DN200 section of drain
- Approx length was 3mtrs
- Achieved over 2 days including training time, commissioning and set-up
- This was removed by rods to the chamber as it moved freely in the drain
- The small section that was seen in the lateral also fell into the submain and removed with rods




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WHAT DID WE DISCOVER?



- DN200 uPVC Pipe
- 100% CSA Concrete
- 2nd last section of drain out of the hotel
- Drain runs in the concrete floor slab of the hotel plant room - 3 metres deep
- Underneath some very large water storage tanks
- Access pipe from inspection chamber
- Concrete in drain starts at approx. 6 metres upstream from chamber
- Unknown length of concrete in pipe



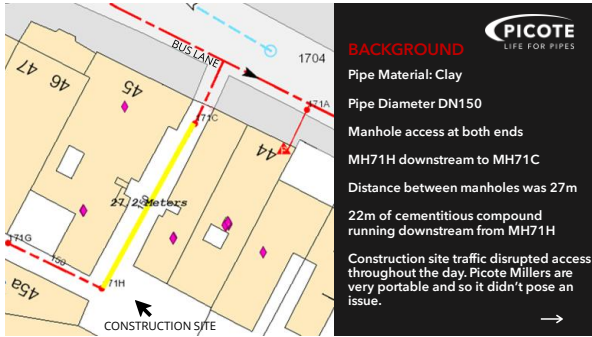
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CLIENT: THAMES WATER
 CONTRACTOR: LANES FOR DRAINS
 SUPPORT: PICOTE UK
 OPERATION: CUTTING OUT CEMENTITIOUS MATERIALS



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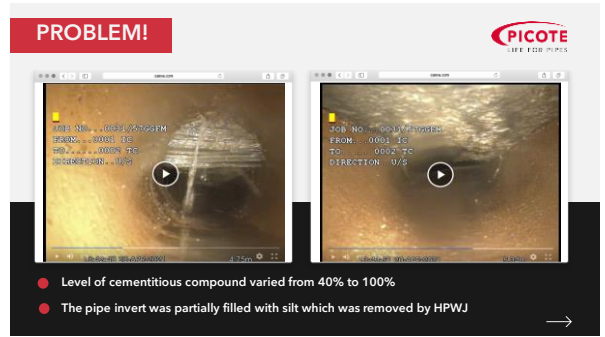
BACKGROUND



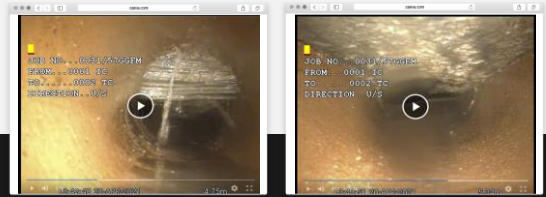
Pipe Material: Clay
 Pipe Diameter DN150
 Manhole access at both ends
 MH71H downstream to MH71C
 Distance between manholes was 27m
 22m of cementitious compound running downstream from MH71H
 Construction site traffic disrupted access throughout the day. Picote Millers are very portable and so it didn't pose an issue.



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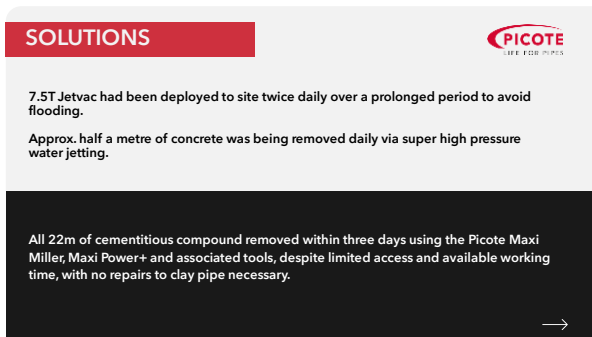
PROBLEM!



- Level of cementitious compound varied from 40% to 100%
- The pipe invert was partially filled with silt which was removed by HPWJ



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SOLUTIONS



7.5T Jetvac had been deployed to site twice daily over a prolonged period to avoid flooding.
 Approx. half a metre of concrete was being removed daily via super high pressure water jetting.

All 22m of cementitious compound removed within three days using the Picote Maxi Miller, Maxi Power+ and associated tools, despite limited access and available working time, with no repairs to clay pipe necessary.



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MILLERS & TOOLS USED



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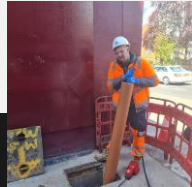
HIGH-SPEED CLEANING



Limited access no issue, portable equipment.



Small worksite footprint. Jetvac was used periodically to remove debris.

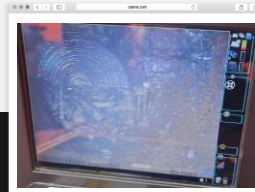


Drop pipe with rest bend utilised so that operator did not need to be in manhole.

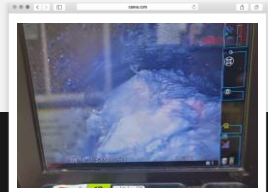


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CCTV PROGRESS CHECK



Rings around the edges show progress where the tool had been working



Build-up of debris where the tool effectively 'pulverised' the cement into dust



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MAXI POWER+ IN ACTION

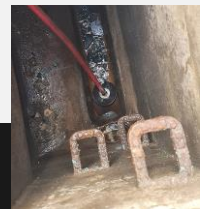


Example of Power+ working (left). Slurry created by pulverized dust (above).




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DEBRIS REMOVED BY HPWJ



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POST WORKS CCTV




No repairs to the clay pipe were required after the works were completed.


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MAXI POWER+ SPECIALISED TOOLS





DN150 SMART CRUSHER IN ACTION

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SUMMARY



- Clay pipe, diameter DN150
- 22m of very hard cementitious compound and silt milled out using a combination of Picote high-speed Millers and tools
- Removal rate varied between 0.5 to 1.5 metres per hour, depending on consistency and hardness of the cementitious material
- There was no difference in performance between the Maxi Miller and Power+ machines
- The Tiger Drill Chains were very effective in breaking through the cementitious material where the pipe was partially filled

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PICOTE MILLER RANGE



8MM	10MM	12MM	18MM
 MINI CLEANER DN82 TO DN75	 MINI MILLER DN82 TO DN82	 MIDI CLEANER DN90 TO DN82	   SUPER MIDI DN90 TO DN82 MAXI MILLER DN75 TO DN250 MAXI POWER+ DN82 TO DN82

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JETTING Vs PICOTE MAXI MILLER

STATS	JETTING 1	JETTING 2	MAXI MILLER
WATER USAGE	9gpm	15gpm	Ave. tap 1-1.5gpm
POWER	8kw	33kw	1.5kw
UNIT WEIGHT	750kg	1000kg	89kg
FUEL TYPE	DIESEL	DIESEL	ELECTRIC
FUEL USAGE	5L/h	7.5L/h	1kw/h
VEHICLE	MEDIUM VAN	MEDIUM VAN	SMALL VAN
CO2 EMISSIONS	2.5L CO2/L DIESEL	2.5L CO2/L DIESEL	0.5L CO2e/kw

- ✓ Significant reduction of water consumption (water only to flush debris after cleaning)
- ✓ Approx. 5 x less equivalent hp CO2
- ✓ Smaller carbon footprint with smaller van/truck required
- ✓ Approx. 3 x less equivalent fuel required (also potentially renewable fuel source)

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MILLER WASTE MANAGEMENT

Miller Frames, Reels and Flexible Shafts can be recycled at metal waste collection points. Outer Casings of the Flexible Shafts can be disposed of as plastic waste. The lubricant is medical grade.

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PICOTE WORKSITE FOOTPRINT

- ✓ Compact, lightweight equipment & tools
- ✓ Highly efficient, save on time & labour
- ✓ Trenchless = less disruption to customer. Less disruption to traffic = lower fuel consumption
- ✓ Avoid flooding incidents due to back pressure when jetting blockages which can damage customer property and increase remedial works required (cleaning works)
- ✓ Small van required

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≥90%

Percentage of Picote components that can be recycled (approx)

- Reducing waste sent to landfills & incinerators
- Saving energy: recycled Aluminium uses around 95% less energy to make than new
- Conserving natural resources
- Reducing pollution & cutting carbon emissions
- Protecting ecosystems & wildlife

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HIGH-SPEED CLEANING

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Benefits

- Portable – No access problems
- Built-in Safety Clutch
- No contact with rotating shaft, therefore very safe to use
- Works well through bends
- No water required
- Vertical and horizontal pipes
- Lower Carbon Footprint at worksite

Current Limitations (depending on model)

- Range between access points (45m maximum)
- Diameter (DN300)



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Contact Picote



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THANK YOU!

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