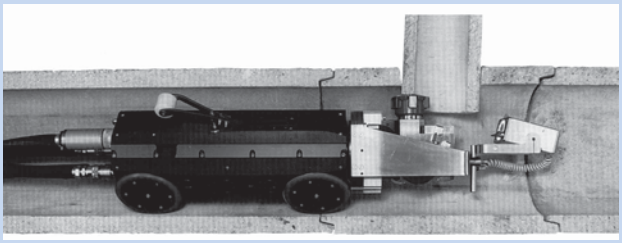
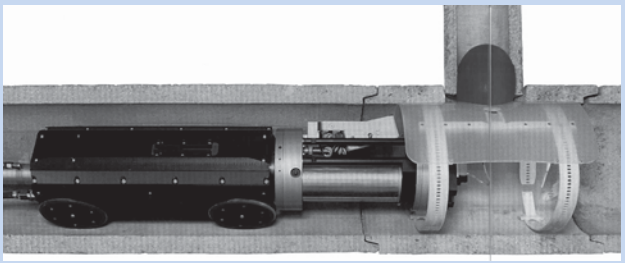
2.2.11 Primo Robot System

Procedure

Procedure Category	*Maintenance / Repair Procedures*
Note	*General information concerning relining procedures is available in section 4.2.1 of IP Construction[1], Maintenance of Inaccessible Channels.*
Producer	*PMO Dübendorf* *KRT Engineering + Handel GmbH Sempach*
Supplier	*KRT Kanalsanierungs-Technik AG*
Brief description	*The robots are put into the pipe section via an inspection shaft and guided to the damage site by an operator in the control vehicle using the remote camera. The damage is repaired by means of various devices capable of carrying out a variety of tasks such as grinding, drilling, injecting, filling and smoothing and sanding. The placing of rubber seals for the repair of lateral connections is also possible.*
Schematic diagram	 
Materials	*2 Component epoxy resin adhesive 96101/96107/96110*
Standards	*Not standardized in Switzerland*
First application	*World wide / Switzerland 1994*

Area of Application

Nature of Damage	*Pipe cross-section:* *- Root penetration* *- Build up of deposits and foreign bodies* *Pipe walls:* *- Axial and radial cracks* *- Flaking and holes* *- Build up of fragments*

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Nature of damage	*Sleeve joints:* *- Leaks* *- Outflow* *Lateral connections:* *- Protruding connections* *- Defects in the connection area* *- Closing and plugging of redundant connections* *- Reconnection during the relining procedure*
Restrictions	*Limitations only in the case of:* *- Pipe wall corrosion* *- Broken or collapsed pipes* *- Positional shifting*
Pipe materials	*All types, restrictions for plastics*
Cross-Sections	*Circular / Oval*
Dimensions	*Circular NW 150 mm to NW 800 mm* *Oval 300/450 mm, 400/600 mm*
Maximum Range	*Up to about 80 m', using cable extending kit of about 40 m'*
Curves – U-Bends	*Limitations to use*

Preparatory Work

Excavations	*Not usually necessary. Access via inspection shafts*
Pipe Cross-Section	*High pressure cleaning*
Lateral Connections	*No prior measures required*
Ground Water	*Plugging may be required according to the nature of the damage*
Water Treatment	*When working in the area of the water flow and for large volumes of water use of by-pass pumps for waste water may be necessary*

Final Tasks

Inspection Shafts	*No measures necessary*
Lateral Connections	*No measures necessary*
Subsequent Treatment	*High pressure cleaning*
Acceptance	*Inspection with pipe remote cameras* *Sealing test using air in accordance with SIA 190*

Remarks	*No reduction in cross-section* *Inflow repair using sealing system*
Status	*August 2001*