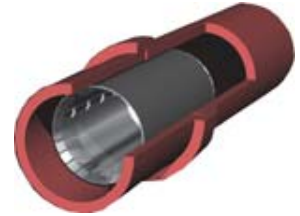




WRc
APPROVED

Certificate No. PT/134/0501

**“WRc Approved”
Case Study-
Link-Pipe Inc.’s Grouting
Sleeve™**



...It was concluded that the Link-Pipe Grouting Sleeve™ has the capability to reinstate a broken sewer pipe to its original structural strength.

Background

Link-Pipe Grouting Sleeve™ is manufactured by Link-Pipe inc. of Canada. It is a local repair system developed for the structural renovation of gravity sewers.

The system is comprised of a stainless steel structural core, which uses a mechanical lock to hold it against the host pipe, the core is surrounded by an absorbent foam gasket. Limit straps prevent the sleeve from expanding beyond a preset diameter, preventing it from harming the host pipe.

The annular space around the structural core is filled with a polyurethane gasket impregnated with grout on site before the sleeve is installed. Being monitored by a CCTV camera, the sleeve is positioned over the damaged area in the sewer. The air plug is then inflated to expand the sleeve until the locks engage. The air plug is then deflated and withdrawn. The installation is complete. The foaming grout continues to expand to fill the annular space and penetrate pipe cracks.

**Grouting
Sleeve™ can
be installed in
less than 20
minutes.**



Scope of assessment

WRc assessed the performance, the strength and effectiveness of the Link-Pipe Grouting Sleeve™ sewer repair system by conducting loading tests on soil-embedded sleeves.

Assessment Program

1. WRc developed an assessment schedule based upon local repair research projects and with reference to the Sewerage Rehabilitation Manual.
2. A technical audit of the product specification, quality control, design method and installation method was undertaken.
3. A test program was undertaken to assess the structural performance of the Grouting Sleeve™ in the soil-embedded broken vitrified clay pipe.
4. The on-site procedures followed manufacturer's installation instructions (see: Link-Pipe Manual: Part 2: 21 October 2000)

Testing

The Grouting Sleeve™ was subjected to an underground loading test to determine its manufacturer claimed capacity to restore the pipe to its original strength.

ISO 9001-2000 REGISTERED COMPANY

LINK-PIPE®, GasSealer™, GROUTING SLEEVE™ are trademarks of Link-Pipe Inc. GROUTING SLEEVE™ is protected by US Patent No. 5,351,720, European Patent No. 0630458, Canadian Patent No. 2,131,291, PCT Patent Pending. GasSealer™ is protected by US Patent No. 6,138,718.





A vertical load was applied.....



All locks remained engaged and there was no evidence of damage to the steel core.



300mm diameter clay pipes were embedded in non-compacted pea gravel in depth 150mm over the crown of the pipe. The second test was conducted in compacted clay 300mm deep over the crown of the sewer.

A vertical load was then applied through the backfill to the buried pipes until failure occurred in a 4-point break. The test was then continued until pipe deformation reached 10%.

The Grouting Sleeve™s (with strain gauges incorporated in the body of the sleeve) were installed into the broken pipes while the test pressure was applied to the overburden.

The load regime used to break the pipes was then repeated on the repaired pipes.

All locks remained engaged and there was no evidence of damage to the steel core.

It was concluded that the Link-Pipe Grouting Sleeve™ has the capability to reinstate a broken sewer pipe to its original structural strength.

Site Installation

Subsequently a site audit was conducted in order to witness the installation of the Link-Pipe Grouting Sleeve™ in accordance with the Manufacturer's Installation Manual.

“**WRC Approved**” means that an independent review has been carried out for the purpose of determining the technical suitability of a product to do the job claimed by the applicant, or whether a contractor is fit to provide the specified service.

Scope of certification-PT/134/0501

The Link-Pipe Grouting Sleeve™ patch repair system for the structural renovation of sewers (150 mm 1300 mm)

This product meets the requirements set out in assessment schedule PT/134/0501-AS

For Specifications and Installations... Visit our Web Site: www.linkpipe.com
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LINK-PIPE®, GasSealer™, GROUTING SLEEVE™ are trademarks of Link-Pipe Inc. GROUTING SLEEVE™ is protected by US Patent No. 5,351,720, European Patent No. 0630458, Canadian Patent No. 2,131,291, PCT Patent Pending. GasSealer™ is protected by US Patent No. 6,138,718.

