

29th International No-Dig Conference and Exhibition 2011

(NO-DIG BERLIN 2011)

**Berlin, Germany
2-5 May 2011**

ISBN: 978-1-61839-106-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2011) by the International Society for Trenchless Technology
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact the International Society for Trenchless Technology
at the address below.

International Society for Trenchless Technology
308 South Lee
Alexandria, Virginia 22314-3814

Phone: 703 299 8484

info@istt.com

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

SESSION 1A – MICROTUNNELING

Moderator: Gerda Hald

Record Trenchless Installation of Seawater Intakes and Outfalls for a Fish Farm Project in Portugal	1
<i>Marc Schuermans</i>	
Innovative Tunneling and Microtunneling Technologies Used in the Construction of the Sewage Transfer System in Warsaw	11
<i>Cezary Madryas, Adam Wysokowski, Marek Gaertig, Lech Skomorowski</i>	
Pipe Jacking Method as an Alternative Method of Trenchless Technologies in Istanbul	20
<i>Mucahit Namli, Erol Guler, Yasin Torun</i>	
Microtunneling Challenges for Crossing Miami Shipping Channel in Karstic Limestone	26
<i>William Bergeson, Varya Nasri</i>	
Tunnelling Below the Groundwater Table, Using Open Front Technology	36
<i>Per Hallager, Liselotte Jensen, Hans Moller, Peter Nordheim, Morten Hansen, Jorgen Mikkelsen</i>	

SESSION 2A – MICROTUNNELING

Moderator: Ray Sterling

Construction of Pressure Pipelines Using Modern CC-GRP Pipes	46
<i>Ziemowit Suligowski, Maria Orłowska-Szostak, Michal Szostak, Cacaveri Massimo, Dariusz Kosiorowski</i>	
Rennes, France - Compliance with EU Water Framework Directive: Storage Collector Built by Microtunneling	58
<i>Damien Maître, Pascal Rault</i>	
Herrenknecht VSM – Innovation in Mechanized Shaft Construction	68
<i>Peter Schmäh</i>	
Microtunnelling – Recent Experience in Ireland	78
<i>Ciaran Reilly, Trevor Orr</i>	

SESSION 3A - JACKING & BORING

Moderator: Keh-Jian Shou

New Milestone in Guided Auger Boring with Front Steer Technology	88
<i>Gregor Nieder</i>	
Trenchless Renewal of Asbestos Pipes in the Brazilian City of Campinas	98
<i>Björn Freimuth</i>	
Practice-Oriented Guideline for the Choice of an Adequate Bentonite Suspension in Pipe Jacking	105
<i>Britta Schoesser, Markus Thewes, Marc Peters, Steffen Praetorius</i>	
Combined Wastewater Holding Sewer: Semi-Open Pipe Jacking Technology	117
<i>Matthias Schütz, Carmen Hinkel, Ralf Eibenstein</i>	
Analysis of the Behavior of Curved Pipejacking with Excessive Resistance	127
<i>K.J. Shou, J.H. Yen</i>	

SESSION 4A - ASSET MANAGEMENT

Moderator: Sissis Kamarianakis

Decision Making For Underground Infrastructure	136
<i>Markus Thewes, Sissis Kamarianakis, Rolf Bielecki</i>	
Reduction of Technological Barriers for the Application of Trenchless Technology on District Heating Pipelines	146
<i>Ingo Weidlich, Daniel Wilmsmeier, M. Achmus</i>	
Webkalkulator24 - A Decision-Making Online Tool for the Installation of Underground Supply Lines	155
<i>Holger Hesse, Leopold Scheuble</i>	

SESSION 1B - HORIZONTAL DIRECTIONAL DRILLING

Moderator: Baosang Ma

Monitoring of Directional Drilling Installations using 3D Visualation Techniques	165
<i>Jason S. Lueke, Samuel T. Ariaratnam</i>	

Principle and Potential Advantages of Reverse Circulation System for Large Diameter HDD Crossing	172
<i>Liyong Wei, Baosong Ma, Yewu Zhang, Xin Jin</i>	
Horizontal Directional Drilling and Burstlining – Exception Becomes Routine: Installation with Ductile Iron Pipes	179
<i>Steffen Ertelt</i>	
Extending the Achievement Portfolio of HDD Rigs	186
<i>Michael Lubberger</i>	
Drilling Through the Mountains: Hard Rock HDD	196
<i>Hans-Joachim Bayer</i>	

SESSION 2B - LINERS & COATINGS

Moderator: Norman Howell

Sliplining - Using State of the Art Technology for Man Entry Sewer Rehabilitation in Linz, Austria	207
<i>Christian Dobretberger, Franz Enzelsberger</i>	
Modernization of the Cracow Non-Circular Sewers using Glassfiber Reinforced Plastic Panels	214
<i>Andrzej Kuliczowski, Ryszard Langer, Aleksandra Wojcik, Dominika Lichosik</i>	
Recent Advances in Close-Fit PE Lining Technology	222
<i>Norman Howell, John De Rosa</i>	
Overview of Spiral Wound Pipe Lining Technologies	232
<i>Klaus Schmager</i>	

SESSION 3B - CURED IN PLACE PIPELINERS

Moderator: Dec Downey

A New UV Sensor Method for Sewer Renovation	242
<i>Michael Röling</i>	
A New Temperature Measuring Set-up to Control Lining Curving During Sewer Renovation	252
<i>Ulrich Glombitza, Marcel Behlau</i>	
Ultrapipe™ Innovative Glass Fabric Solutions for Global CIPP Industry	262
<i>Kees den Besten, Marc Matthe, Jerome Francois, Jan Coerts, Chris Skinner</i>	
A Utility Perspective: What’s Holding CIPP Lining Back from Gas Industry Applications in North America?	272
<i>George Ragula</i>	
Choosing the Priority Pipe Section of Water Disposal System Which Should be Renovated	279
<i>V.A. Orlov, V.V. Stepanov, A.V. Maleeva</i>	

SESSION 4B - LINERS & COATINGS

Moderator: Gunter Kaltenhäuser

Manhole Renovation Through Coating – Mortar Technology, Requirements on Material and Application Technology	286
<i>Gunter Kaltenhäuser</i>	
Wall Thickness Required for Sewer Linings	296
<i>Bernhard Falter, Sebastian Fingerhut</i>	
Long Pipe Lining of Sewage Pipes ‘Tight-in-Pipe’ in the City of Salzgitter	306
<i>Björn Freimuth</i>	

SESSION 1C - ASSET MANAGEMENT

Moderator: Jeff Pace

Survey Results from Various Cities Define Benefits of Structural Water Main Rehabilitation Program	313
<i>Isabel Tardif, Joseph Loiacono</i>	
A New Form of Asset Management for Sewer Networks	327
<i>Wout Broere, Gerard van der Hoop, Johan W. Bosch</i>	
The Evaluation of Decision Variables for the Rehabilitation of Water Mains in Durban, South Africa	338
<i>Simon R. Scruton, Jeroen Bosboom, Anne Fijma</i>	
Adding Value to Sanitary Sewers – An Important Asset of Municipalities	351
<i>V. Firat Sever, Barton Bradshaw, Yasin Torun</i>	
Using Leak Detection for Dyke Integrity Management	361
<i>Mike Wrigglesworth, Geert Jan van Heck, Koen Kinsbergen, Jeff Kler</i>	

SESSION 2C - TESTING & ASSESSMENTS

Moderator: Piero Salvo

NODIG Technologies – Innovative Solutions for Efficient and Fast Pipe Rehabilitation 371
Ulrike Rabmer-Koller

The MAC Testing Device for the Mechanical Assessment of Man Entry Sewers 381
Olivier Thépot

Polyethylene Pipes in Non-Conventional Installations: PE100-RC Development Milestones and Perspectives 389
Etienne Laurent, Pierre Belloir, Hugues Haubruge

Comparative Product Test "Tube Liners for Lateral Pipes" 399
B. Bosseler, K. Harting, A. Redmann

SESSION 3C - TESTING & ASSESSMENTS

Moderator: Ian Moore

Measuring the Influence to Existing Utilities of Nearby Trenchless Operations..... 409
Noriyuki Horichi, Youji Oku, Isamu Ono, Atush Koizumi

Case Study of Economic Impact Connected with the Elimination of Groundwater Infiltration in a Sewer Main..... 419
Andrzej Kuliczowski, Justyna Lisowska, Maria Gierczak

Current Trenchless Experience and Rehabilitation Needs of Sewer System in Istanbul..... 429
Ahmet Gulec, Mustafa Bayraktar, Yasin Torun, Fevzi Yilmaz

Quality Assurance in Pipe-Jacking 439
B. Bosseler, Martin Liebscher, Frank Bersuck

Effect of Wall Corrosion and Backfill Erosion on the Strength of Deteriorated Metal Culverts..... 449
Mohamed El Taher, Ian D. Moore

SESSION 4C - TESTING & ASSESSMENTS

Moderator: Robert Stein

Quality Assurance for Long Distance and Curved Jacking 459
R. Stein, D. Beckmann

The OPAL Pipeline – A Special Pipeline With the Application of a Special Coating 474
Urs Pedrazza

Effects of Mixing Energy on Placing Properties of Injection Grouts in Formed In Place Pipes (FIPP)..... 484
Keisuke Takahashi, Thomas A. Bier

AUTHOR ABSTRACTS

Session Order (1A, 1B, 1C - 2A, 2B, 2C - 3A, 3B, 3C - 4A, 4B, 4C)..... 494
N/A

Author Index