

PROCEEDINGS OF THE INTERNATIONAL LECTURE SERIES TBM TUNNELLING TRENDS
HAGENBERG/AUSTRIA/14-15 DECEMBER 1995

Tunnel Boring Machines

Trends in Design & Construction of Mechanized Tunnelling

Edited by

HARALD WAGNER & ALFRED SCHULTER

D2 Consult, Linz, Austria



A.A. BALKEMA / ROTTERDAM / BROOKFIELD / 1996



TABLE OF CONTENTS

B. Buchberger	
Welcome address	1

C. Leitl	
Welcome address of the Government of Upper Austria	3

BLOCK A - TBM DRIVE - TECHNOLOGY

H. Wagner	
TBM tunnelling based on Geomechatronic	
Key note lecture	7

H. Einstein	
Decisions aids for tunnelling	13

G. Swoboda / M. Mansour	
Three-Dimensional numerical modelling of slurry shield tunnelling	27

K. H. Gehring	
Design Criteria for TBM's with respect to real rock pressure	43

M. Herrenknecht	
Latest developments in mechanised tunnelling technology	55

S. Strohhausl	
TBM tunnelling under high overburden with yielding segmental linings	
(Eureka Project EU 1079 - "Contun")	61

H. G. Jodl / R. Stempkowski	
Operations research aspects of TBM drives - Case study of Wienerwald-Tunnel	69

BLOCK B - TBM AUTOMATION, SIMULATION AND QUALITY CONTROL

S. Stifter	
Chances for cooperation between industry and university -	
Synergies for TBM tunnelling	83

A. Schulter	
The importance of geometry for computer controlled segment erection	89

R. Bielecki / J. Schreyer	
Suitability test for the segmental lining for the Elbetunnel 4th tube, Hamburg	99

W. Sadgorski	
European geotechnical engineering norm ENV 1997-1 and its meaning for tunnelling	107

H. Erten / G. Kriegl	
TBM-Simulator - Interface model between machinery and lining	115

DINNER SPEECH

S. Pelizza	
Dinner Banquet at Schloß Weinberg	123

BLOCK C - TBM CHALLENGES

S. Babendererde / L. Babendererde	
Experiences in mechanized tunnelling	127

O. Bouygues	
Geotechnical investigation during TBM drive at EOLE-Project, Paris	139

D. Gunaratnam	
Technology for tunnel construction with special applications for Wanjiazhai Water Transfer Project	147

H. A. Janzon	
High speed tunnelling in Sydney's Blue Mountains	153

R. Sternath	
Construction of the railway tunnel under the Great Belt - Risk and chances	161

A. Haack	
Comparison between conventional tunnel driving method and TBM drives. Worldwide demand of tunnel constructions	179

J. Golser	
Case study of an alpine transit freight tunnel concept. Influences of geology on tunnel technology	191

T. Hanamura	
State of the art of the Japanese TBM technology. New developments	199

BLOCK D - TBM TUNNEL LINING / SEGMENT MANUFACTURING

R. Heilegger / A. Beil
Full automated tunnel segment production system. A case study 215

W. Liniger
Quality control on computer controlled tunnel segment manufacturing plant 223

N. Herwegh
Requirements for sealing gaskets in yielding joints of TBM tunnelling 231

W. Grabe
Design of gasktes for deformable tunnel lining joint configuration.
New developments 239

E. Zenker
Joint connectors for tunnell linings 243

D. Moyson
Precast tunnel segment reinforced with steel wire fibre reinforced
concrete (SFRC) - Astate of the art 247

CLOSING LECTURE

H. Wagner
Closing lecture 257

Author Index 263