



Challenges & Changes

TUNNELLING ACTIVITIES IN JAPAN 1994

JAPAN TUNNELLING ASSOCIATION

CONTENTS

Preface	1
Index	2
General Aspects of Tunnelling in Japan	3
List of Members	31

PREFACE



Shin-ichiro ASAI

President
Japan Tunnelling Association

Tunnels expand the foundation of human activity. Therefore, very naturally, most tunnels are constructed as public works, or quasi-public works which receive subsidies of public money. Consequently, from the taxpayers' standpoint, it is desired that construction cost be held to a minimum. However, from the users' standpoint, satisfactory function and lasting durability in terms of safety and pleasantness are desired. In order to simultaneously satisfy these contradictory demands, a compromise must be found from a broad viewpoint in the planning and design of a tunnel. To this end, advance investigations of the geological conditions at the planned location of the tunnel are of course essential. Especially, I want to emphasize the importance of advance investigations, including investigations during the progress of construction, in those cases where the geological conditions are predicted to be complex and quickly changing.

Although investigation technology has not yet reached a level of development where the results of geological investigations can be expected to be perfectly accurate, marked advancement has been achieved compared to the past. Although no particular mention is made in this booklet regarding geological investigations, I wish the reader to understand that detailed geological investigations have been performed for the planning and design of all the tunnel projects which are introduced here.

I will be pleased if the information presented in this booklet will be of assistance in the construction of similar tunnel projects. I wish to add that the Japan Tunnelling Association is always cooperative with requests for more detailed information.

INDEX


4 Three-Centered Circular Shield for Subway Station Construction




16 Design Features of TTB Highway Tunnels




5 New Technology to Be Used on Tokyo Subway Loop Line




17 Tokyo Expressway Goes Underground for Environmental Preservation



7 Underpinning for Tunnel Beneath Shinkansen Station



19 Innovations in Automation of Shield Tunnel Driving



8 Uplift Prevented by Chemical Grouting



20 ECL Tunnel with Reinforcing Bars in Soft Ground



9 Seikan Tunnel Maintenance



21 Pumped Storage Power Plant Utilizing Seawater



11 TBM Used to Drive Pilot Tunnel



22 Shield Tunnel Driven down 27% Descending Grade



12 Highway Tunnel Constructed Close over Railway Tunnel



23 Large Rock Cavern Excavated in Complex Rock Formation




13 Twin Tunnel Approach to The Akashi Straits Bridge



25 Japan's First Underground Crude Oil Storage Facilities are Completed



15 Shallow Twin Tunnel Beneath Densely Built-up Area



27 Innovations in Technology

