

Challenges & Changes

# TUNNELLING ACTIVITIES IN JAPAN 2000



JAPAN TUNNELLING ASSOCIATION

# CONTENTS

Preface	1
Index	2
General Aspects of Tunnelling in Japan	30
List of Members	31

## PREFACE



*Hiroshi Hagiwara*

**Hiroshi HAGIWARA**

President  
Japan Tunnelling Association

It is my great pleasure to have the opportunity to greet tunnel engineers throughout the world on this occasion of the publication of the 2000 edition of this biennial booklet of the Japan Tunnelling Association (JTA).

JTA was established in 1975, and will mark its 25th anniversary this year. Since that time, large quantities of underground space, including urban space as well as tunnels for roads, railways and waterways, have been constructed in Japan, and JTA is proud of the contribution which it has made during this period through its activities including the exchange of technical information and support of technical development. Further, as a member of the International Tunnelling Association, JTA has at the same time made endeavors for worldwide exchange of information regarding tunnel technology.

Tunnels in hard rock, soft rock and through fault zones, tunnels and underground space in soft alluvial ground in urban areas; numerous underground works of various kinds are being designed and constructed in Japan at the present time using various techniques including NATM, shield machines of various types for soft ground, TBM's for hard ground, ground freezing, immersed tunnel laying and many others.

In this last year of the present century and on entering a new millennium, representative examples have been selected from among these numerous projects to be presented in outline form in this booklet. I hope that these articles will be informative to the reader.

# INDEX

<p><b>3</b> Construction Progresses on New Shinkansen Railway Lines</p>		<p><b>15</b> Metropolitan Expressway Central Circular Shinjuku Route</p>	
<p><b>5</b> Wide Segments Employed on New Joban Line</p>		<p><b>17</b> Excavation in Fractured Zone and Unconsolidated Ground</p>	
<p><b>6</b> Yokohama Underground Station for Minatomirai 21 Line</p>		<p><b>18</b> Otsu Discharge Channel Tunnel</p>	
<p><b>7</b> Tokyo Metropolitan Subway Loop Line</p>		<p><b>19</b> Metropolitan Area Outer Discharge Channel</p>	
<p><b>9</b> Kobe Municipal Subway Kaigan Line</p>		<p><b>20</b> Area Saving Shaft System for Sewer Reconstruction</p>	
<p><b>10</b> Large Cross Section Tunnel Being Constructed under Built-up Area</p>		<p><b>21</b> Long Distance, T-Branch and High-Speed Automated Shield Machines</p>	
<p><b>11</b> Present Status of Tunnels on New Tomei Meishin Expressway</p>		<p><b>23</b> Japan's Largest Pumped Storage Hydropower Station</p>	
<p><b>13</b> Double-Tier Tunnel for Inter-City Expressway</p>		<p><b>24</b> CAES-G/T Pilot Plant</p>	
<p><b>14</b> Large Diameter TBM at Hida Tunnel</p>		<p><b>25</b> Innovations in Technology</p>	