



ITA TUNNELLING  
AWARDS 2018



# The Norwegian Rock Blasting Museum

*Lillehammer, Norway*



Presented by: Ola Woldmo, Chairman





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The Norwegian landscape and topography creates challenges and advantages that made tunnelling an important competence for development of modern infrastructure.

- 1,800 road and rail tunnels
- 200 underground powerhouses with >5,000 km of water and access tunnels
- >300 caverns for defense, oil and water storage
- The worlds largest Olympic sports cavern underground

*Dyrskar (1891), The first road tunnel*





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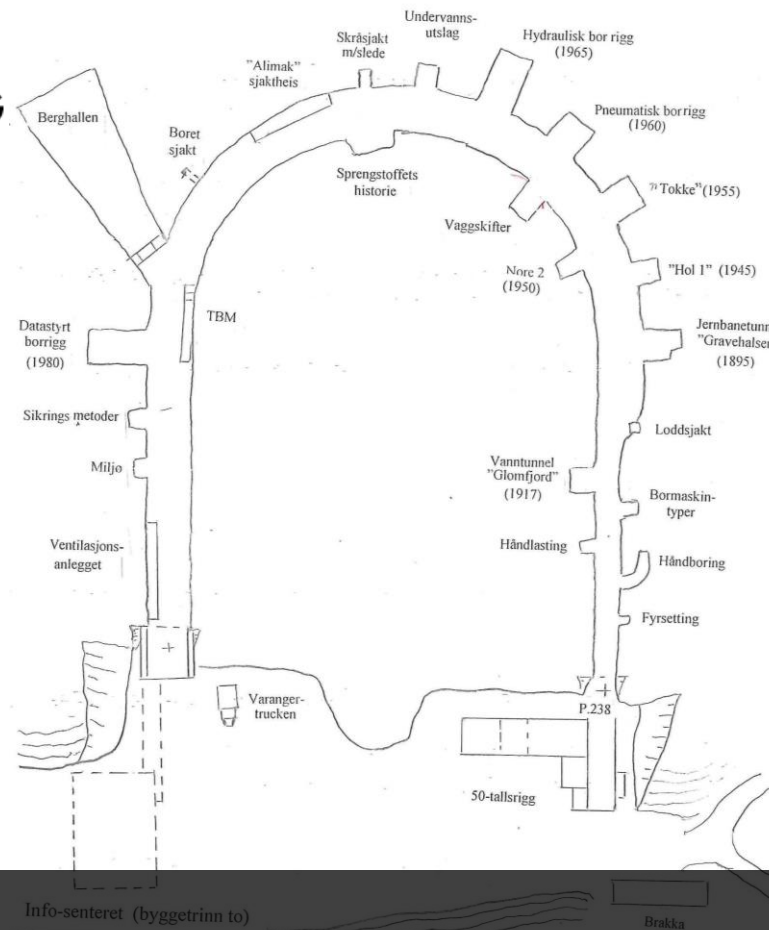


## Innovations in Norwegian Tunnelling

- Robotic applied wet sprayed concrete for rock support – 1965
- NGI published the Q-method for rock mass classification – 1974
- First unlined sub sea road tunnel in Vardø – 1982
- First Robbins High Performance TBM with 19 inch cutters for HEPP tunnels – 1988
- Gjøvik Olympic Cavern Hall, unlined with 61 m span – 1994
- Longest road tunnel in the world with Single Shell Concrete Lining, Lærdal tunnel 24,5 km – 1995
- Systematic pre-injection for water ingress control in urban tunnels
- Utilizing unlined pressurized tunnels in HEPP up to 1040 m water head
- Underwater piercing in lakes and sea bed for water intake and oil pipe tunnels (deepest piercing today is 175 m)



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*Museum layout with stations  
and exhibitions*

**An idea came to life.**





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The first idea to establish a tunnelling museum was born in Statkraft in January 1990. Together with the Norwegian Public Roads Administration and enthusiastic members of the Norwegian Tunnelling Society, the museum tunnel and cavern was founded and built by some of the member contractors. The museum was opened to the public in June 2004.





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The museum is a 240 m long unlined horse shoe shaped tunnel, with 18 niches and a restaurant/concert cavern.

WANG CHUNYU AND THE FIRST  
TUNNELING TEAM





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Portal with snow cover, as well as compressor house and workshop.





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Traditional modular site office with integrated living quarters made as info center.





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## Main stakeholders

*Advisory body:*

Board and supporting members of the  
Norwegian Rock Blasting Museum Association



*Contributing to construction and item collection:*

Members of the Norwegian Tunnelling Society



*Owner and operator:*

Norwegian Public Roads Administration



**Statens vegvesen**





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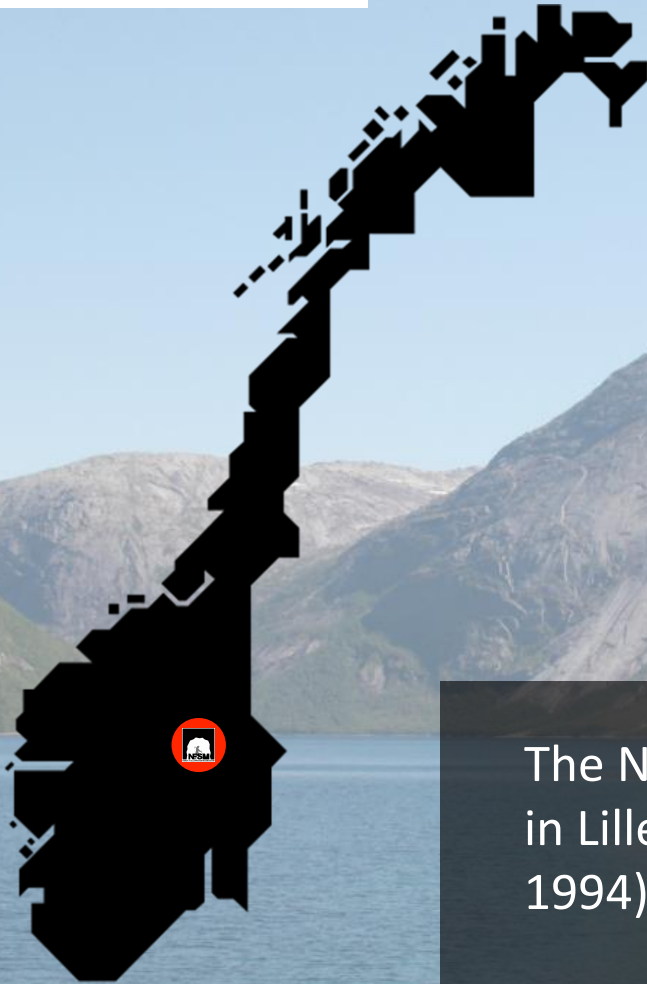
## Members of The Norwegian Rock Blasting Museum Association:







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The Norwegian Rock Blasting museum is located in Lillehammer, Norway (the Winter Olympic City 1994).





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**INNOVATIVE  
UNDERGROUND SPACE  
CONCEPT  
- OF THE YEAR -**

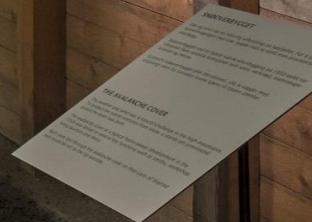


The main entrance to the museum tunnel. Tours with multi language guides every day in the summer and on demand in the winter season.





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Entrance building with typical snow protection shelter  
and historical photos.





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Guided tours with stop in niches to learn about tunnelling history from virtual tunnelers.





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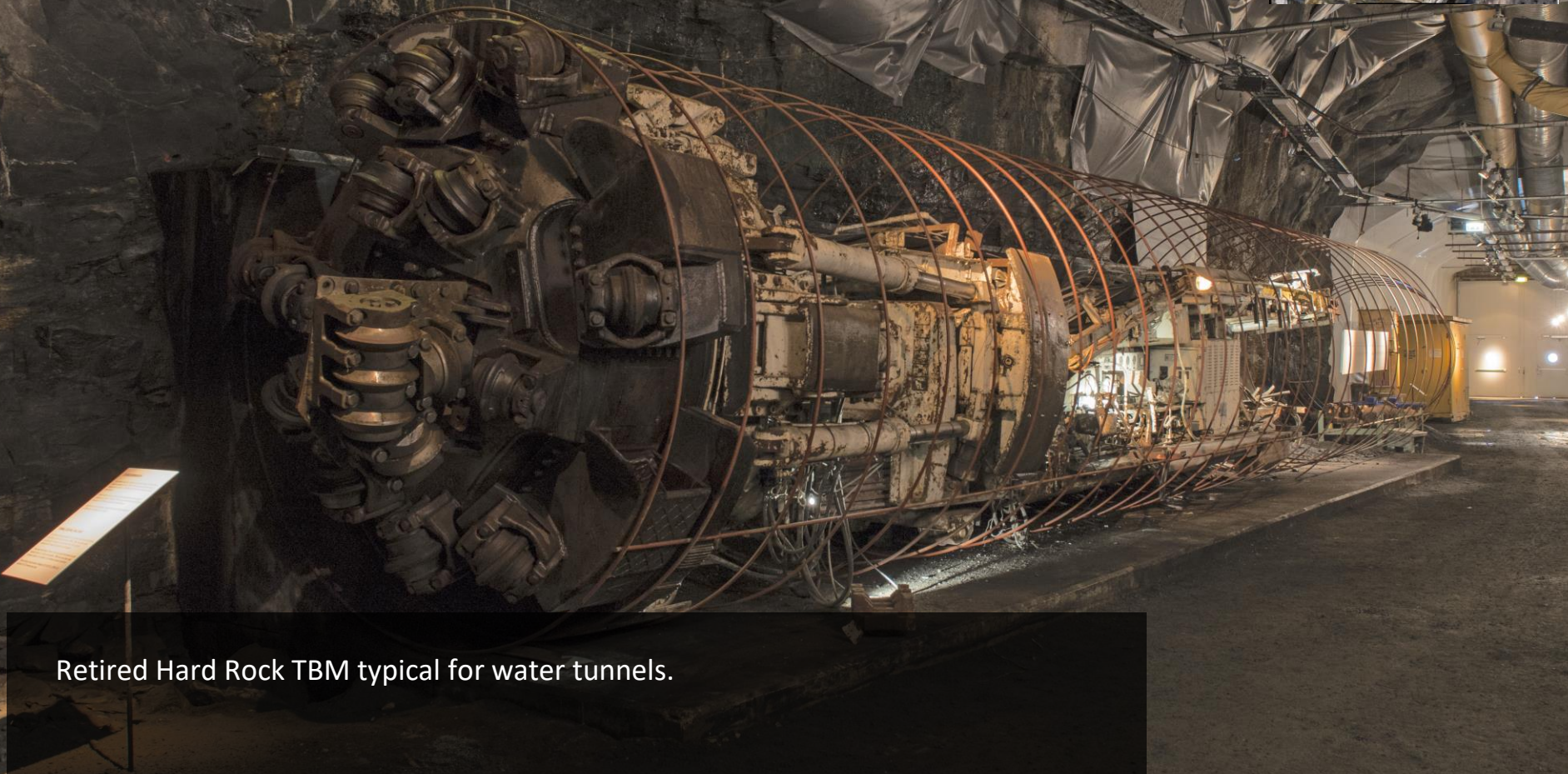
School classes on regular visits to learn about tunnelling.

Visited by ITA Executive Counsel with Former Presidents Martin Knights, Søren Eskesen and Current President Tarcisio Celestino in April 2008.





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Retired Hard Rock TBM typical for water tunnels.





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The museum rock cavern with kitchen. Made for gatherings like dinners, concerts and other social events. Hunderfossen Hotel located in walking distance from the museum.





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Family day in August every year with over 4000 visitors of all ages.





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*Thank you for your attention.*