

Publications by Dr. Arild Palmström

Papers and articles

1. Barkey H. and Palmström A.: *Some results of an engineering geological investigation in the Breiskar discharge tunnel, Norway*. First International Congress of the International Association of Engineering Geology, Paris 1970, pp. 1160 – 1171.
2. Palmström A.: *Karakterisering av oppsprekningsgrad og fjellmassers kvalitet*. (In English: Characterization of jointing density and the quality of rock masses.) Internal report, A.B. Berdal, Norway, 1974, 26 p.
3. Torblaa I., Schieldrop B. and Palmström A.: *Dam Tunsbergdalsvatn, a dam subjected to waves generated by avalanches and to extreme floods from a glacier lake*. Int. Congr. on Large Dams 12 Mexico 1976, Transactions, Vol. III p. 861 -875.
4. Palmström A.: *Bruk av ingeniørgeologi ved Rygene kraftverk*. (In English: The use of engineering geology at Rygene Power Plant.) National annual conference Bergmekanikkdagen, Oslo, 1979, pp. 23.1 – 23.14.
5. Buen B., Gustavsen T. and Palmström A.: *Erfaringer fra oppfylling av uforete trykksjakterog –tunneler med opptil 590 m trykk*. (In English: Leakage measurements and control during filling up of unlined tunnels and shafts with internal head up to 590 m. National annual conference Bergmekanikkdagen, Oslo 1979, pp. 27A.1 – 27A.11.
6. Buen B. and Palmström A.: *Design and supervision of unlined hydropower shafts and tunnels with head up to 590 m*. ISRM Symposium, Aachen, 1982, pp. 567 – 574.
7. Fredriksen U. and Palmström A.: *20 m høy fjellfangdam ved Rånåsfoss kraftverk*. (In English: Design and construction of a 20 m high rockmass cofferdam at Rånåsfoss Power plant). National annual conference Bergmekanikkdagen, Oslo 1982, pp. 28.1 – 28.11.
8. Palmström A.: *The volumetric joint count - A useful and simple measure of the degree of rock mass jointing*. IAEG Congress, New Delhi, 1982. V. 221 – V.228.
9. Palmström A.: *Problems during construction of the Vardö Tunnel - a 2.6 km long submarine road tunnel*. IAEG Congress, New Delhi, 1982, IV. 231 – IV.244.
10. Palmström A.: *Stabilitetsberegninger før og erfaringer etter 25 m neddemming av den 300 m høye Storskreura i Tunsbergdalen*. (In English: Stability evaluations before and experience after 25 meter of inundation of 300 m high scree in the Tunsbergdalen reservoir.) National annual tunnelling conference Bergmekanikkdagen, Oslo 1983, pp. 27.1 – 27.15.
11. Palmström A.: *Geo-investigation and advanced tunnel excavation technique important for the Vardø subsea road tunnel*. Int. symp. on Low Cost Road Tunnels, Oslo 1984, 15 p.
12. Palmström A. and Kollström J.I.: *The use of geo-engineering know-how gave large savings for the one-lane Lyse road tunnel*. Int. symp. on Low Cost Road Tunnels, Oslo 1984, pp. 205-213.
13. Palmström A.: *Undersjøiske tunnelkryssinger kan være attraktive løsninger sammenlignet med bruer*. (In English: Concept study of the Northern Norway railway extension shows that undersea tunnels may be attractive solutions compared with bridges.) Journal of Våre Veger no. 10, 1984.

14. Palmström A and Lien R.: *Håndbok i ingeniørgeologi – berg*. (In English: Handbook in rock engineering). Tapir Publishing company, 1985, 140 p.
15. Palmström A.: *Tjodan kraftverk: Verdens lengste uforete og borete trykksjakt*. (In English: Tjodan power plant: The world's longest unlined TBM drilled pressure shaft.) Journal of Bygg bd. 33 no 5, 1985, 3 p.
16. Palmström A.: *Application of the volumetric joint count as a measure of rock mass jointing*. Int. symp. on Fundamentals of Rock Joints, Björkliden, Sweden, 1985, pp. 103 – 110.
17. Palmström A. and Kollström J.I.: *Drifterfaringer fra uforet trykksjakt, Tjodan kraftverk*. (In English: Construction of the Tjodan unlined shaft with 896 m static head.) National annual tunnelling conference Bergmekanikkdagen, Oslo, 1985, pp. 38.1 – 38.14.
18. Palmström A.: *The volumetric joint count as a measure of rock mass jointing*. Invited lecture at the F3 (Fracture, Fragmentation and Flow) Conference, Jerusalem, 1986, 19 p.
19. Palmström A.: *Grunnundersøkelser for vegtunneler. Kostnadene kan reduseres ved rasjonell geoplanlegging*. (In English: Field investigations for road tunnels. Costs can be reduced by rational geoplanning.) Journal of Våre Veger no. 7, 1986.
20. Lynneberg T.L., Palmström A., Roska S. and Carstens K.J.: *Geology, design, construction and maintenance of Vardö sub-sea road tunnel*. Int. conf. on Strait Crossings, Stavanger, Norway, 1986, pp. 623 – 641.
21. Palmström A.: *Sub-sea rock tunnels*. Invited paper at the Int. conf. on Strait Crossings, Stavanger, Norway, 1986, pp. 111 – 139.
22. Palmström A.: *En praktisk, generell metode for identifisering av bergmasser som grunnlag for sikringsbestemmelse og TBM-inndrift*. (In English: A general, practical method for identification of rock masses to be used in evaluation of rock mass stability conditions and TBM capacities.) National conference Bergmekanikkdagen, Oslo, 1986, pp. 31.1 – 31.31.
23. Strömquist R. and Palmström A.: *Sub-sea pipeline shore approaches combined with process and storage facilities in rock*. Offshore Oil and Gas Pipeline Technology Seminar, London, 1987, 23 p.
24. Palmström A.: *Ny metode for beregning av stabilitetssikring og TBM-inndrifter*. (In English: New method for evaluation of rock support and TBM-capacities.) Journal of Våre Veger no. 1, 1987.
25. Palmström A.: *Veger under vann*. (In English: Roads below lakes and sea). Journal Samferdsel nr. 6 – 1987, pp. 21 – 23.
26. Palmström A. and Schanche K.: *Design features at Tjodan save time and money*. Int. Water Power and Dam Construction, June, 1987, 6 p.
27. Palmström A.: *Norwegian design and construction experience of unlined pressure shafts and tunnels*. Int. Conf. on Hydropower, Oslo, 1987, 13 p.
28. Holestöl K. and Palmström A.: *Subsea tunnelling for oil: The Petromine concept*. Tunnelling and Underground Space Technology. Vol. 2, No. 4, 1987, 31.1 - 31.31.
29. Palmström A.: *Subsea tunnels*. In Norwegian Tunnelling Today, 1988. Tapir Publishers, Trondheim, Norway, pp. 93 – 96.

30. Garmo T. and Palmström A.: *The geological history of Norway*. In Norwegian Tunnelling Today, 1988. Tapir Publishers, Trondheim, Norway, pp. 25 – 40.
31. Palmström A.: *Unlined high pressure tunnels and shafts*. In Norwegian Tunnelling Today, 1988. Tapir Publishers, Trondheim, Norway, pp. 73 – 75.
32. Palmström A.: *Norwegian experience with subsea tunnels*. Int. conf. on Tunnels and Water. Madrid, 1988. A.A. Balkema publishers, Rotterdam. 8 p.
33. Palmström A. and Berthelsen O.: *The significance of weakness zones in rock tunnelling*. Inter. conf. on Rock mechanics and Power Plants, Madrid, Spain, 1988, pp. 381 – 388.
34. Palmström A.: *Forundersøkelser for tunneldrift*. (In English: Preinvestigations for tunnel excavation.) National conference Bergmekanikkdagen, Oslo, 1988, pp. 28.1 – 28.12.
35. Selmer-Olsen R. and Palmström A.: *Tunnel collapses in swelling clay zones, part 1*. Tunnels & Tunnelling, November 1989, pp. 49 – 51.
36. Selmer-Olsen R. and Palmström A.: *Tunnel collapses in swelling clay zones, part 2*. Tunnels & Tunnelling, January 1990, pp. 55 – 58.
37. Palmström A.: *Introduction to Norwegian subsea tunnelling*. Publ. No. 8, issued by the Norwegian Soil and Rock Engineering Association, 1992, pp. 8 – 12.
38. Palmström A. and Naas R.: *Norwegian subsea tunnelling - rock excavation and support techniques*. Int. Symp. on Technology of bored tunnels under deep waterways, Copenhagen, 1993, pp. 201 – 225.
39. Palmström A.: *The new Austrian tunnelling method*. Conf. on Fjellsprengningsteknikk, Bergmekanikk, Geoteknikk, Oslo, 1993, pp. 31.1 – 31.20.
40. Palmström A.: *The challenge of subsea tunnelling*. Tunnelling and Underground Space Technology, Vol. 9, No. 2, 1994, pp. 145 – 150.
41. Palmström, A.: *RMi – a rock mass characterization system for rock engineering purposes*. PhD thesis, University of Oslo, Department of Geology, 1995. 405 p.
42. Palmström A.: *Characterizing the strength of rock masses for use in design of underground structures*. Int. Conf. on Design and Construction of Underground Structures, New Delhi, 1995. 10 p.
43. Palmström A.: *Case histories in design and construction of underground structures*. Int. Conf. on Design and Construction of Underground Structures, New Delhi, 1995. 10 p.
44. Palmström A.: *Characterizing rock burst and squeezing by the rock mass index*. Int. Conf. on Design and Construction of Underground Structures, New Delhi, 1995. 10 p.
45. Barton N., Grimstad E., and Palmström A.: *Design for tunnel support*. Chapter 8 in Sprayed Concrete, properties, design and application, ed. by S.A. Austin and P.J. Robins, 1995, pp. 148 – 168.
46. Palmström A.: *RMi - a system for characterizing rock mass strength for use in rock engineering*. Journal of Rock Mechanics and Tunnelling Technology, Vol. 1, Number 2, 1995, pp. 69 – 108.
47. Palmström A. and Naas R.: *Under the sea in Norway*. World Tunnelling, November 1995, pp. 353 – 360.

48. Palmström A.: *The weighted joint density method leads to improved characterization of jointing*. Int. Conf. on Recent Advances in Tunnelling Technology, New Delhi, India 1996, pp. 9 – 14.
49. Palmström A.: *Information on the Ph.D. on Rockmass index (R_{Mi})*. Journal Byggaktuelt, 1995.
50. Palmström A.: *Application of seismic refraction survey in assessment of jointing*. Int. Conf. on Recent Advances in Tunnelling Technology, New Delhi, India, 1996, pp. 15 – 22.
51. Palmström A.: *R_{Mi} - a new practical characterization system for use in rock engineering*. Swedish annual conference, Svenska Bergmekanikdagen, 1996, Stockholm, pp. 39 – 63.
52. Palmström A.: *The rock mass index (R_{Mi}) applied in rock mechanics and rock engineering*. Journal of Rock Mechanics and Tunnelling Technology, Vol. 2, Number 1 1996
53. Palmström A.: *Characterizing rock masses by the R_{Mi} for use in practical rock engineering. Part 1: The development of the rock mass index (R_{Mi})*. Tunnelling and Underground Space Technology, Vol. 11, No. 2, 1996, pp. 175 – 186.
54. Palmström A.: *Characterizing rock masses by the R_{Mi} for use in practical rock engineering. Part 2: Some practical applications of the rock mass index (R_{Mi})*. Tunnelling and Underground Space Technology, Vol. 11, No. 3, 1996, pp. 787 – 303.
55. Gomnaes P.C. and Palmström A.: *Creative use of the underground in Oslo, the capital city of Norway*. North American Tunneling '96, pp. 785 – 793.
56. Holestöl K. and Palmström A.: *Extensive use of the underground in Oslo is giving a better city*. Proc. Int. Conf. on Tunnels for the Third Millennium, Prievidza, Slovakia, 1996, pp. 103 – 114.
57. Palmström A.: *Engineering geology and rock engineering applied in Norwegian tunnels*. Proc. Int. Conf. on Tunnels for the Third Millennium, Prievidza, Slovakia, 1996, pp. 59 – 74.
58. Palmström A.: *A new method to characterize rock masses for applications in rock engineering*. National annual tunnelling conference Bergmekanikkdagen, Oslo, 1996, pp. 38.1 – 38.27.
59. Hope J., Palmström A., and Finnerud K.: *Rebuilding of the 70 years old Nore I power plant*. Int. Conf. on Hydropower '97, Trondheim, Norway, 1997, 8 p.
60. Palmström A.: *Collection and use of geological data in rock engineering*. ISRM News, 1997, pp. 21- 25
61. Palmström A. and Skogheim A.: *New Milestones in subsea blasting at water depth of 55 m*. Tunnelling and Underground Space Technology, Vol. 15, No. 1, 1999, pp. 65 – 69.
62. Nilsen B., Palmström A. and Stille H.: *Quality control of a sub-sea tunnel project in complex ground conditions*. ITA World Tunnel Congress '99, Oslo, pp. 137 – 145.
63. Holmöy K., Lien J.E. and Palmström A. (1999): *Going sub-sea on the brink of the continental shelf*. Tunnels & Tunnelling International, May 1999, pp. 25 - 30.
64. Palmström A., Stille H. and Nilsen B. (2000): *The Fröya tunnel – a sub-sea road tunnel in complex ground conditions*. Swedish annual conference, Svenska Bergmekanikdagen, 2000, pp. 19 – 30.
65. Palmström A. and Nilsen B. (2000): *Engineering geology and rock engineering. Handbook*. Publ. No. 2, issued by the Norwegian Soil and Rock Engineering Association, 2000, 265 p.

66. Palmström A. (2000): *Recent developments in rock support estimates by the RMI*. Journal of Rock Mechanics and Tunnelling Technology, Vol. 6, No. 1, May 2000, pp. 1 – 19.
67. Palmström A., Milne D. and Peck W. (2000): *The reliability of rock mass classification used in underground excavation and support design*. ISRM News, Vol. 6, No. 3, 2001, pp. 40 – 40.
68. Palmström A. and Singh R. (2001): *The deformation modulus of rock masses - comparisons between in situ tests and indirect estimates*. Tunnelling and Underground Space Technology, Vol. 16, No. 3, 2001, pp. 115 - 131.
69. Palmström A. (2001): *Measurement and characterization of rock mass jointing*. In In-situ characterization of rocks. Sharma V.M. and Saxena K.R. eds., A.A. Balkema publishers, 2001, pp. 49 – 97.
70. Nilsen B. and Palmström A. (2001): *Stability and water leakage of hard rock subsea tunnels*. Conf. on Modern Tunneling Science and Technology; Adachi et al. (eds), 2001, Kyoto, Japan; pp. 497-502.
71. Palmström A., Blindheim O.T. and Broch E. (2002): *Q-systemet – Muligheter og begrensninger*. (In English: The Q system – possibilities and limitations.) Norwegian annual tunnelling conference Fjellsprengningsteknikk / Bergmekanikk / Geoteknikk, Oslo, 2002, pp. 41.1 – 41.44.
72. Palmström A.: *Riktig omfang av undersøkelser*. (In English: Appropriate amount of ground investigations.) Conf. on Investigations for constructions in rock. Kursdagene NTNU, Trondheim, 2003, 22 p.
73. Palmström A. (2003): *Erfaringer fra Vardo, Nordkapp, Oslofjorden and Bomlafjorden tunnelene*. (In English: Experience from the Vardo, Nordkapp, Oslofjorden and Bomlafjorden tunnels.) Conf. on Investigations for constructions in rock. Kursdagene NTNU, Trondheim, 2003, 18 p.
74. Palmström A., Nilsen B., Pedersen K.B. and Grundt L. (2003): *Riktig omfang av undersøkelser for berganlegg*. (in English: Appropriate amount of ground investigations.) Miljø- og samfunnstjenlige tunneler. Publikasjon nr. 101, 2003, Vegdirektoratet, Statens vegvesen
75. Palmström A. (2003): *Ras i vanntunneler – Et vedlikeholdsproblem?* (In English: Slides and collapses in Norwegian water tunnels – a maintenance problem?) Conference on Vassdragsteknisk forum, arranged by Norwegian Electricity Industry Association, Oslo, 2003, 6 p.
76. Stille H. and Palmström A. (2003): *Classification as a tool in rock engineering*. Tunnelling and underground space technology, Vol. 18, 2003, pp. 331 – 345.
77. Palmström A. (2003): *Riktig omfang av grunnundersøkelser for berganlegg*. (In English: Appropriate amount of ground investigations.) Norwegian annual tunnelling conference Fjellsprengningsteknikk/ Bergmekanikk/ Geoteknikk, Oslo, 2003, pp. 5.1-5.17.
78. Palmström A. (2005): *Measurements of and correlations between block size and rock quality designation (RQD)*. Published in Tunnels and Underground Space Technology, Vol. 20, 2005, pp. 362-377.
79. Palmström A. and Broch E. (2005): *Use and misuse of classification systems with particular reference to the Q-system*. Tunnels and Underground Space Technology, Vol. 21, 2005, pp. 575 – 593.
80. Palmström A. and Gausereide L-R. (2006): *Hva kreves og hva boer være med i en geologisk anbudsbeskrivelse?* (In English: What is required and what should be included in the geological description in a tender document?) Norwegian annual tunnelling conference Fjellsprengningsteknikk / Bergmekanikk / Geoteknikk, Oslo, 2006, pp. 17.1-17.9.

81. Palmström A. and Stille H. (2007): *Ground behaviour and rock engineering tools for underground excavations*. Tunnelling and Underground Space Technology, Vol. 22, 2007, pp. 363–376.
82. Stille H. and Palmström A. (2008): *Ground behaviour and rock mass compositions in underground excavations*. Tunnelling and Underground Space Technology, Vol. 23, 2008, pp. 46 – 64.
83. Huang Z. and Palmström A. (2007): *Application of Norwegian Subsea Tunnel Experience to Construction of Xiamen Xiang'an Subsea Tunnel*. Int. symp. on Construction techniques of subsea tunnels, Nov. 6-8, 2007, Xiamen, China. 12 p.
84. Palmström, A. (2009): *Technical note. Combining the RMR, Q, and RMI classification systems*. Tunnelling and Underground Space Technology Vol. 24, 2009, pp. 491 – 492.
85. Palmström A. and Stille H. (2010): *Rock Engineering*. Book published by Thomas Telford, London, 2010, 408 p.
86. Stille H. and Palmström A. (2011): *Rock Engineering and Tunnelling - a Nordic approach*. ITA congress, Helsinki, 2011. 33 p.
87. Aasen O., Odegaard H. and Palmström A. (2013): *Planning of pressurized headrace tunnel in Albania*. Norwegian Hydropower Tunnelling series, Publ. no. 22, 8p.
88. Nilsen B. and Palmström A. (2013): *Methodology for predicting and handling challenging rock mass conditions in hard rock subsea tunnels*. Int. conf. on Strait Crossings, Bergen, Norway, 11p.
89. Palmström A. (2013): *Geo-registrations, rockmass conditions and ground quality*. Published in www.rockmass.net, 32p
90. Olsson R. and Palmström A. (2014): *Critical review of EC7 concerning prescriptive measures for rock mechanics design*. Int. Conf. EUROCK 2014, Vigo, Spain, pp. 1493 - 1498
91. Palmström A. (2014): *Norske tunnelbyggere verdens beste – en myte?* (in English: Norwegian tunnel builders are the world's best – a myth?) Annual Conf. on Fjellsprengningsteknikk / Bergmekanikk / Geoteknikk 2014, Oslo, pp.5.1 – 5.19.
92. Palmström A. and Stille H. (2014): *Rock Engineering*, second edition. Book published by ICE Publishing (Thomas Telford) 2014, London. 444 p.
93. Palmström A. and Broch E. (2017): *The design of unlined hydropower tunnels and shafts: 100 years of Norwegian experience*. J. of Hydropower & Dams, Issue 3, 2017.
94. Palmström A. (2017): *Classification systems and use of geological data*. Int. conf. Tunnels and Climate Change, 12 Iranian Tunnelling Conference, Nov. 2017. 32 p.
95. Palmström A. (2018): *Ras i tunneler. Hva kan vi laere?* (in English: Collapses in tunnels. What can we learn?) Conf. on Fjellsprengningsteknikk / Bergmekanikk / Geoteknikk 2014, Oslo, pp. 5.1 – 5.19.
96. Stille H. and Palmström A. (2018): *Practical use of the concept of geotechnical categories in rock engineering*. Tunnelling and Underground space technology. no. 79 (2018), pp. 1 – 11.
97. Spross J., Stille H., Johansson F. and Palmström A. (2018): *On the need for a risk-based framework in Eurocode 7 to facilitate design of underground openings in rock*. Rock Mechanics and Rock Engineering. 5 p.

98. Spross J., Stille H., Johansson F. and Palmström A. (2019): *Principles of risk-based rock engineering design*. Rock Mechanics and Rock Engineering. 15 p.
99. Garmo T.T. and Palmström A. (2020): *Naturens kunstverk gaar rett paa tippet* (in English: Nature's works of art are thrown on the muck pile.) To be published in 2020