
Contents

Foreword	vii
Félix DARVE	
Introduction	xi
Eric VINCENS	
Chapter 1. Dry Stone Retaining Walls	1
Eric VINCENS	
1.1. Introduction.	1
1.2. Plane slope dry stone retaining walls	4
1.2.1. Experimental campaigns.	4
1.2.2. Full DEM approach	5
1.2.3. A mixed DEM–continuum approach	27
1.2.4. Conclusion.	34
1.3. Highway dry stone retaining walls	35
1.3.1. Experimental campaigns.	35
1.3.2. Mixed DEM-continuum approach	37
1.3.3. Conclusion.	44
1.4. Conclusion	46
1.5. Notations	47
1.6. Acknowledgments.	48
Chapter 2. Rockfill Dams with Dry Masonry	49
Jean-Jacques FRY and Jean-Patrick PLASSIARD	
2.1. Introduction.	49
2.2. Dam performance and rockfill behavior	51
2.2.1. Development of the dry masonry face rockfill dam	51

2.2.2. Cross-section, construction process and stone pitching	56
2.2.3. Observed damage on the dry stone pitching	60
2.2.4. Dry stone rockfill dam performance	64
2.2.5. Shear strength of rockfill	70
2.2.6. Compressibility of rockfill	75
2.2.7. Scale effects	78
2.2.8. Time effects	80
2.2.9. Appraisal of the behavior of dry stone rockfill dams	84
2.3. Numerical modeling of dry stone rockfill dams	85
2.3.1. Introduction	85
2.3.2. Constitutive equations and software	90
2.3.3. Calibration of parameters	92
2.3.4. Large-scale modeling: construction of the analyzed section	104
2.4. Results of analysis and interpretation	108
2.4.1. Stability analysis	108
2.4.2. Influence of breakages on dam deformations	111
2.4.3. Seismic analysis.	125
2.5. Physical tests for DEM model qualification.	128
2.5.1. Objectives	128
2.5.2. Physical properties of random rockfill	129
2.5.3. Physical and mechanical properties of dry stone pitching	129
2.5.4. Mechanical properties of random rockfill	130
2.5.5. Angle of repose of the slope of the random rockfill.	130
2.5.6. Angle of repose of the rockfill dam with dry stone pitching	133
2.6. Conclusion	135
Conclusion	137
Bibliography	139
Index	149