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XVIII EUROPEAN CONFERENCE ON SOIL MECHANICS AND GEOTECHNICAL ENGINEERING
26 - 30 August Lisbon Portugal

UPC

Numerical Analysis of an Unstable Slope

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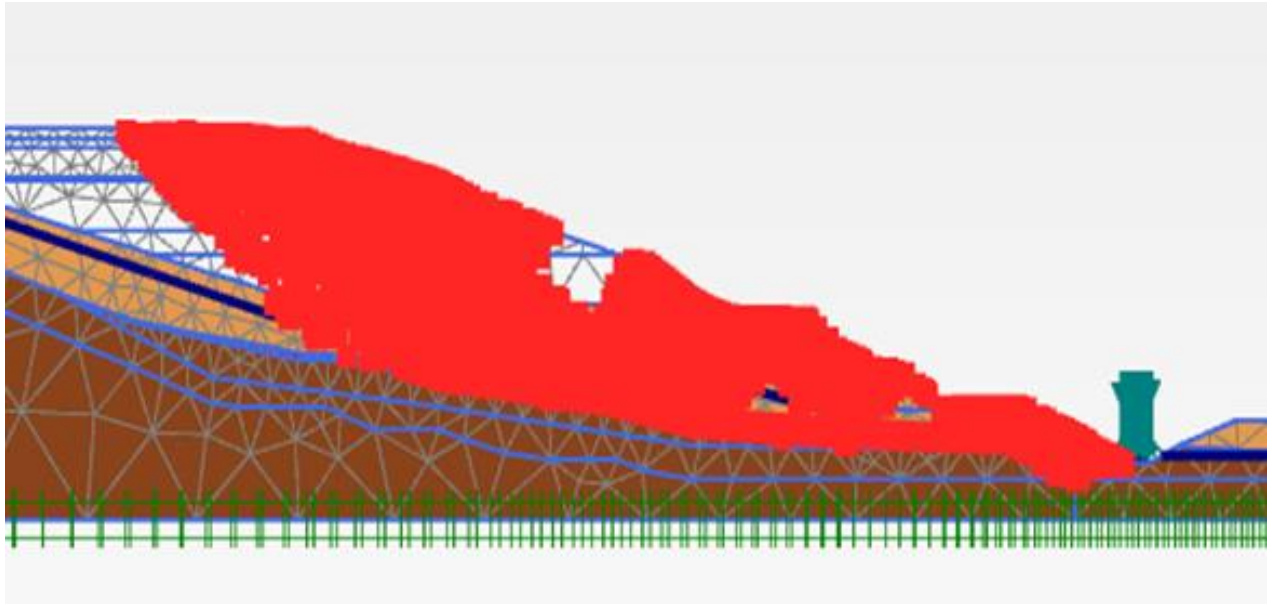

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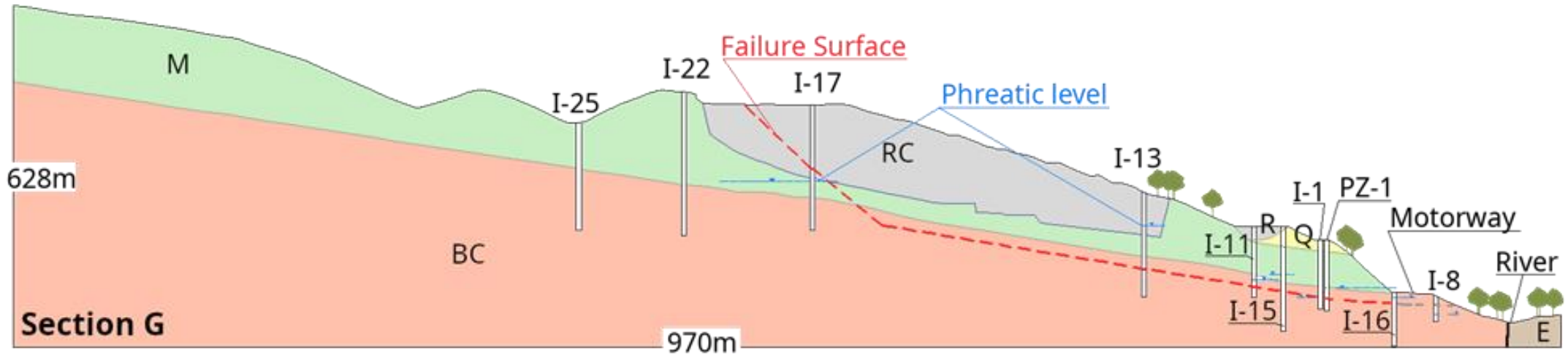
→ Introduction

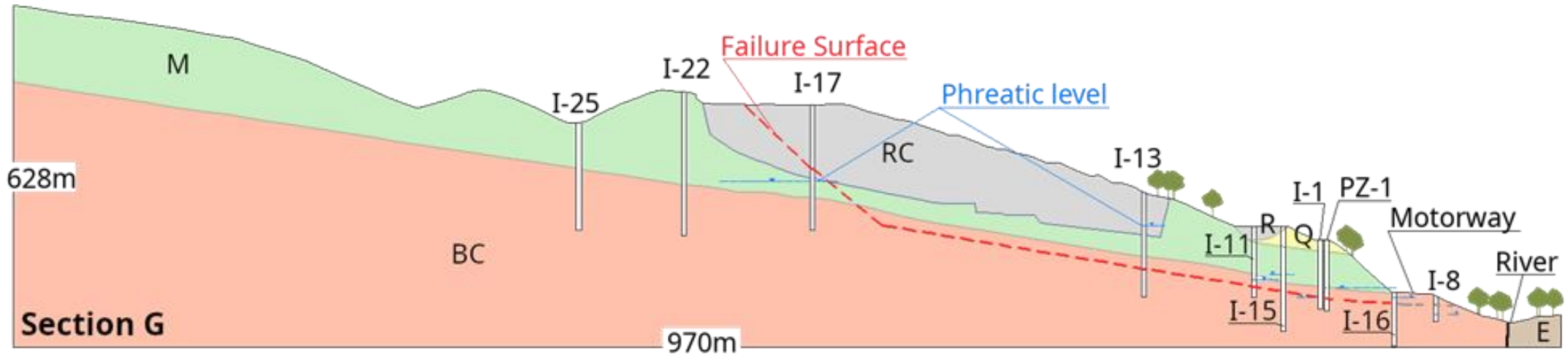
- Layout of the motorway and the old quarry on the upper part of the slope (right-hand side)
- Location of Section G object of this study.

→ Geological Profile



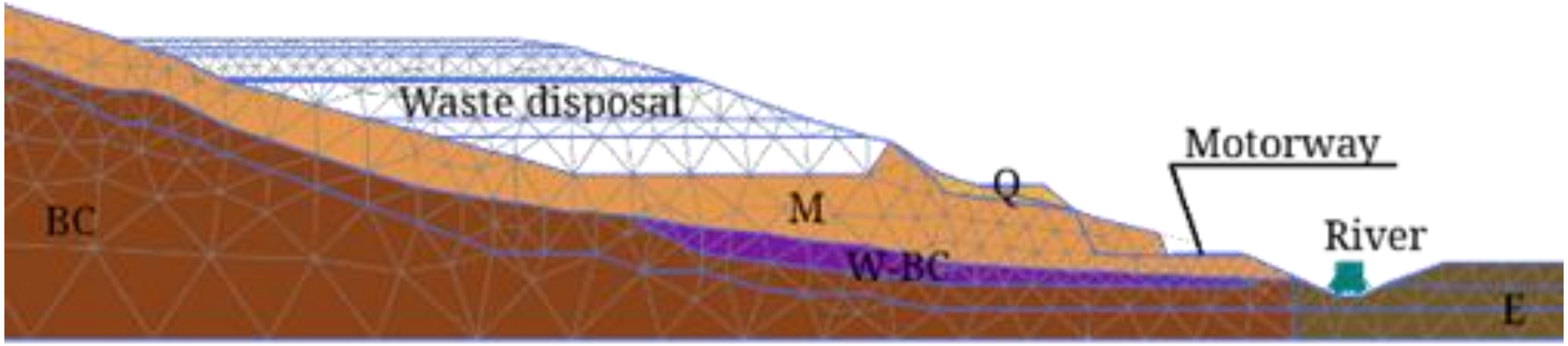
Material	USCS	Description
RC	-	Construction waste materials
R	-	Anthropic fills
E	Not available	Eocene siltstones and sands

→ Geological Profile



Material	USCS	Description
Q	GC	Sandy clays with gravel from the Quaternary Era
M*	CL	Alternation of dolomitic and calcareous rocks from the Middle Triassic
BC	SC, CL	Shale, claystone and sandstone deposits from the Lower Triassic

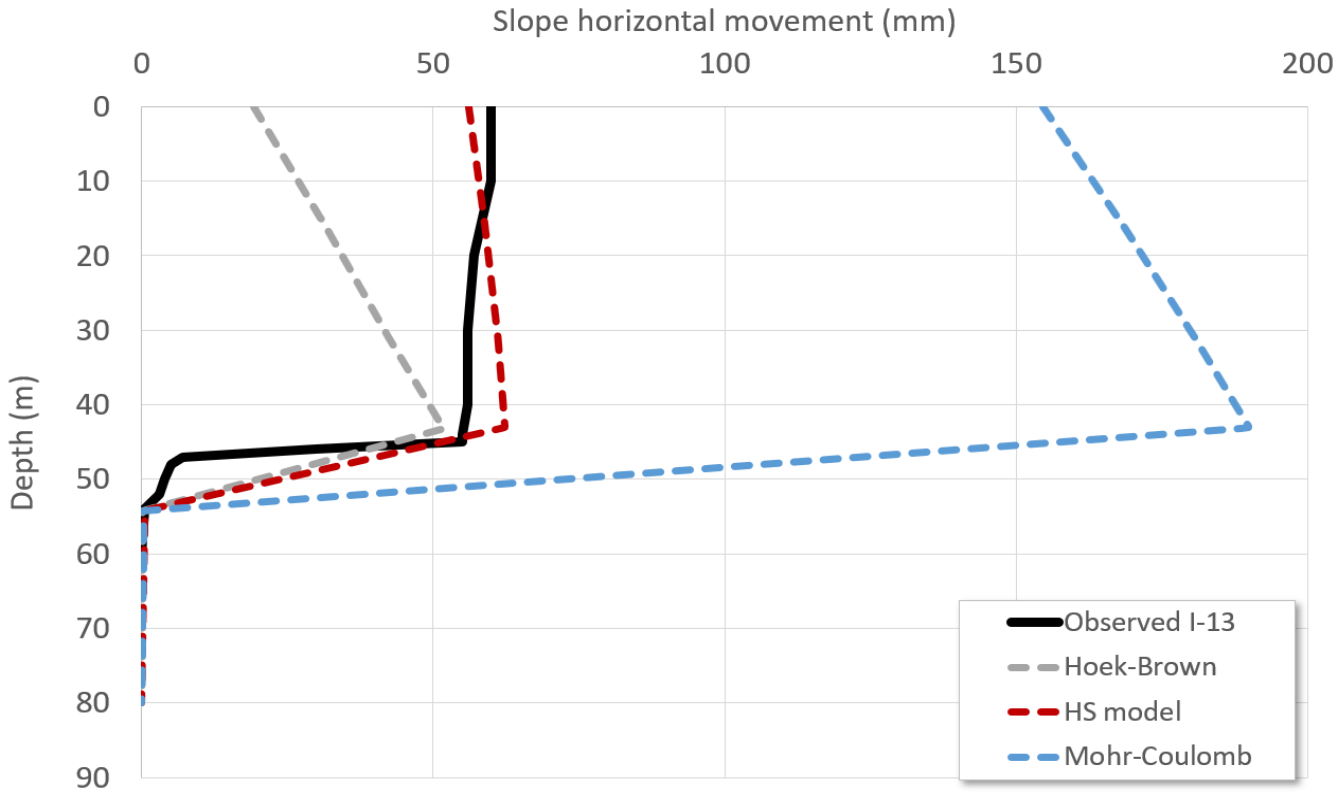
→ Numerical Model



Layer	c′ (kPa)	ϕ′ (º)	E_{50} (MPa)	E_{oed} (MPa)	E_{ur} (MPa)
M	20	30	1426	1069	2994
BC	33	38	8750	6560	18375
W-BC	0	18	10	7.5	21

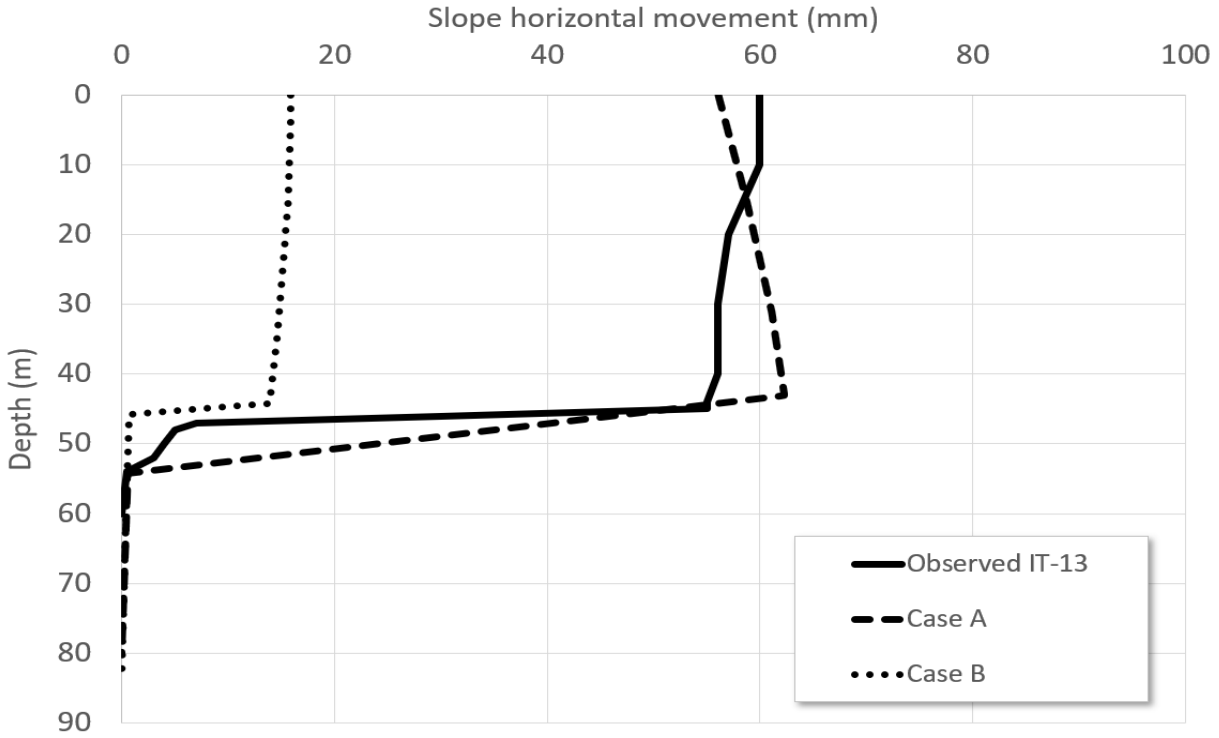
Strength and stiffness parameters of the M, BC and W-BC deposits for the HS constitutive model.

→ Variations of Constitutive Models



Observed horizontal movement with depth, at inclinometer I-13 and numerical results obtained with different constitutive models.

→ Variations of Slip Surface



Observed horizontal movement, at inclinometer I-13 and numerical results, considering different slip surface thicknesses.

→ Conclusion

- The shape of the slip surface, as it is registered by inclinometer readings, could only be adequately replicated considering the weathering of the shale deposits from the Lower Triassic.
- The non-linearity of ground behaviour in elastoplastic domains is crucial to reproduce the observed slope movement.
- Ground movement distribution is strongly affected by the width of the failure surface.

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Acknowledgements

Thank you for your attention!