



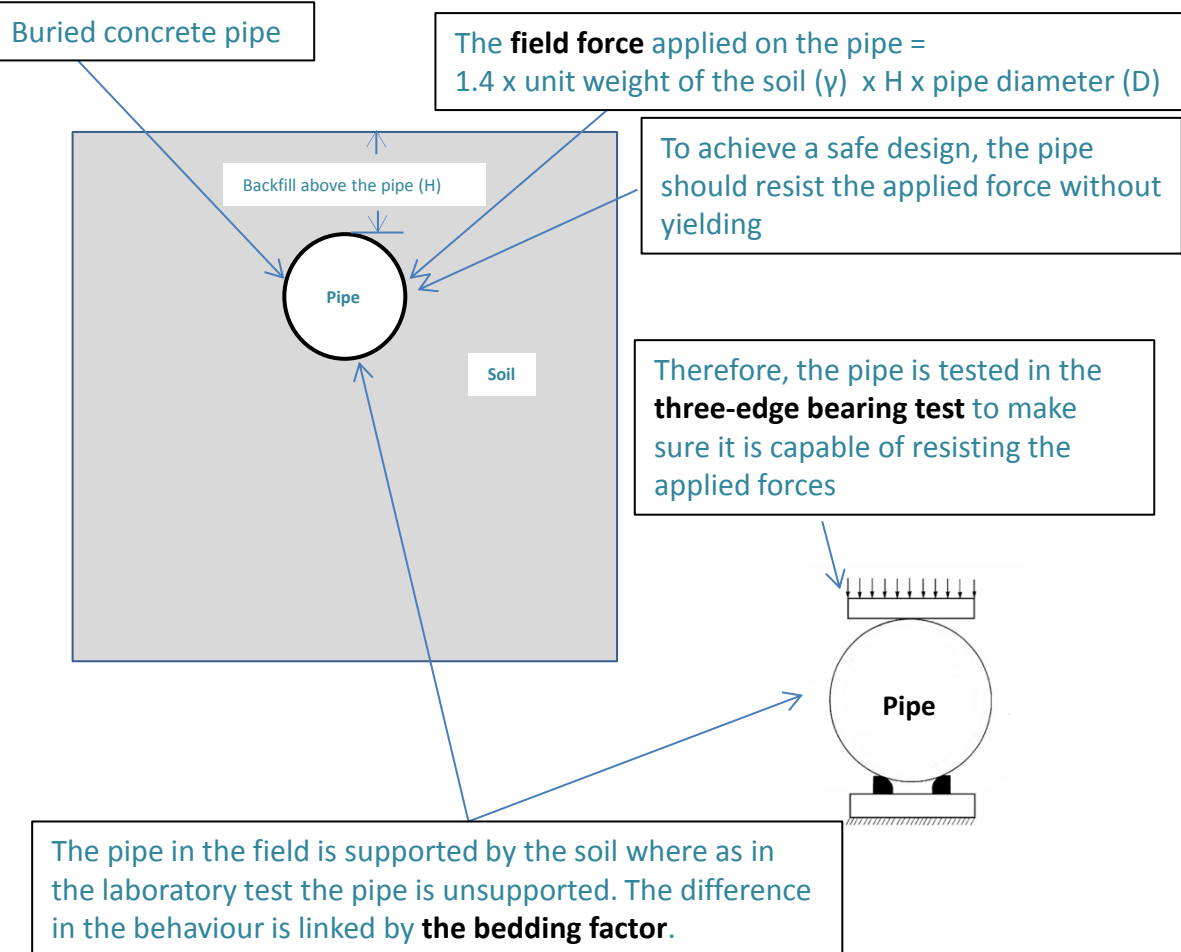
UNIVERSITY OF BIRMINGHAM

Numerical Investigation of the Bedding Factors for Concrete Pipes under Deep Burial Conditions

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1 - Background



2 - Problem

A thorough review of the literature showed that bedding factors have not received significant attention in previous studies, although it is key to the design of concrete pipes

3 - Aim

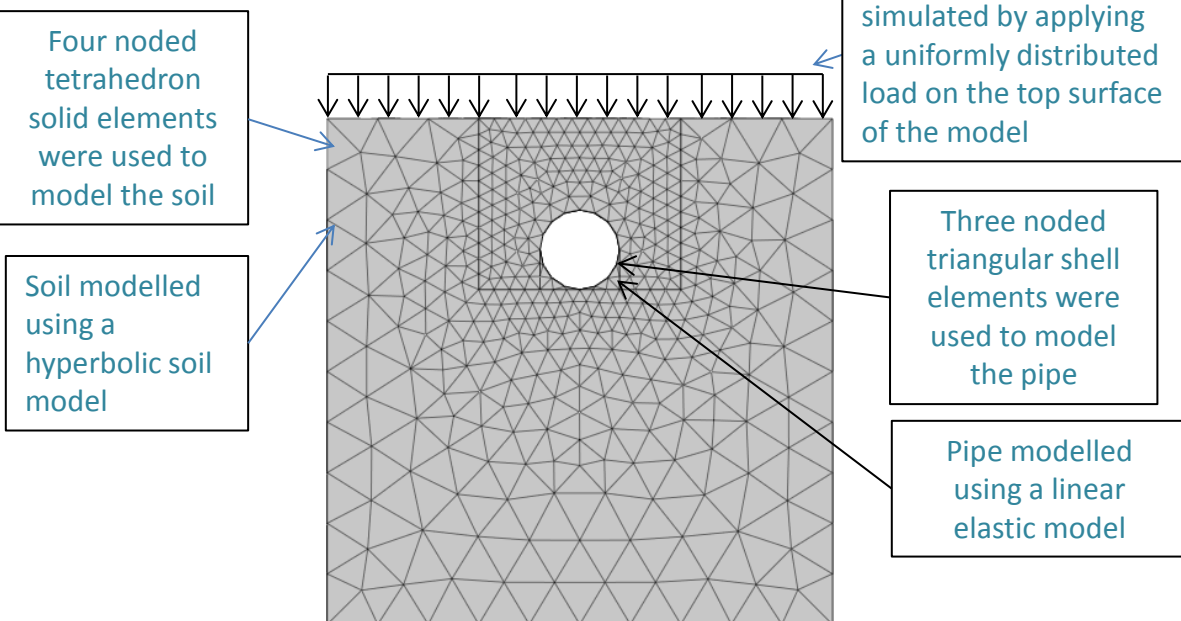
To study the bedding factors using robust finite element modelling and compare the results with the AASHTO standard and the British Standard (BS)

4 - Methodology

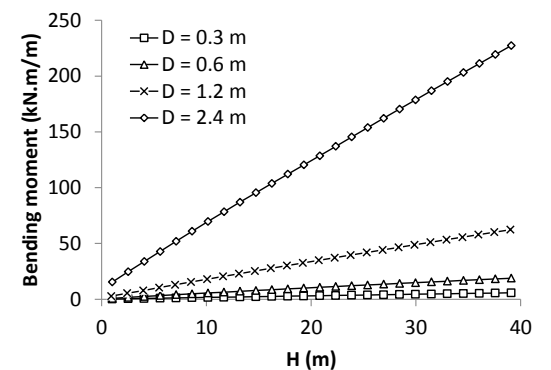
- Stage 1 - Literature Review
- Stage 2 - Finite Element Modelling (See Section 5)
- Stage 3 - Results (See Section 6)
- Stage 4 - Conclusions and Future Research (See Section 7)

6 - Results

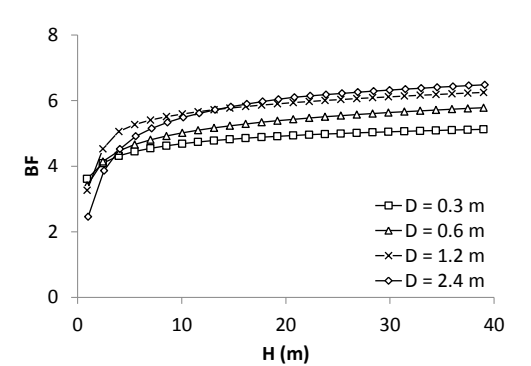
5 - Finite Element Modelling (FEM)



Increasing the backfill height linearly increases the maximum bending moment in the pipe wall for all of the diameters (D) considered in this study



The relationship between the bedding factor and the diameter of the pipe (D) is complex. This is due to the effect of soil arching

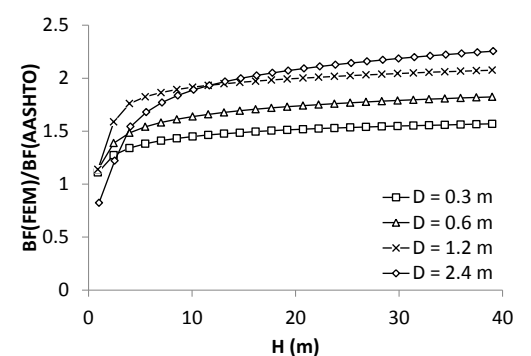


7 - Conclusions and Future Research

- Increasing the backfill height linearly increases the maximum bending moment in the pipe wall
- The recommended bedding factors by AASHTO are shown to be very inaccurate
- The recommended bedding factors in the BS are conservative. This means that current design practice is not economic
- An update to the current bedding factor is required in both standards to achieve a more robust and economical concrete pipe design and this is the aim of future work



The AASHTO bedding factors are conservative except for a pipe with an inside diameter of 2.4 m buried with a backfill height less than 1.2 m



The BS bedding factors are conservative for all of the considered diameters

