

Appendix A

FEM basis functions

The six Hermite interpolating polynomials used as a local FEM basis are given by

$$\begin{aligned}u_1(x) &= x^2 - 1.25x^3 - 0.5x^4 + 0.75x^5 \\u_2(x) &= 0.25(x^2 - x^3 - x^4 + x^5) \\u_3(x) &= 1.0 - 2.0x^2 + x^4 \\u_4(x) &= x - 2.0x^3 + x^5 \\u_5(x) &= x^2 + 1.25x^3 - 0.5x^4 - 0.75x^5 \\u_6(x) &= 0.25(-x^2 - x^3 + x^4 + x^5) .\end{aligned}\tag{A.1}$$