LATERAL PILE ANALYSIS

Project: Sample Project
Number: LP-2026-002
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1. INPUT PARAMETERS

Parameter	Symbol	Value	Unit
Pile length	L	15.00	m
Pile diameter	D	0.610	m
Young's modulus	E	200000000	kPa
Wall thickness	t	0.0127	m
Flexural rigidity	EI	212651	kN-m^2
Lateral load at head	V_t	100.0	kN
Moment at head	M_t	0.0	kN-m
Axial load	Q	0.0	kN

1. SOIL PROFILE

Soil Layer Definition

#	Top (m)	Bottom (m)	Description	p-y Model	Key Parameters
1	0.0	15.0	Soft clay	SoftClayMatlock	c=50 kPa, γ=17.0 kN/m^3, ε50=0.02, J=0.5

1. PILE SECTION PROPERTIES

Moment of Inertia (hollow pipe)

$$I = \pi/64 \times (D^4 - d^4)$$

$$I = \pi/64 \times (0.6100^4 - 0.5846^4)$$

$I = \mathbf{1.063255e-03}$ m^4

Flexural Rigidity

$$EI = E \times I$$

$$EI = 200000000 \times 1.063255e-03$$

$EI = \mathbf{212,651}$ kN-m^2

1. SOLVER PERFORMANCE

Finite Difference Solution

$$Iterativep-ymethod : EI \times d^4y/dz^4 + Q \times d^2y/dz^2 - p(y,z) = 0$$

Converged = **Yes**

COM624P finite difference formulation

Iterations: 43

1. KEY RESULTS

Pile Head Response

Quantity	Value	Unit
Head deflection	7.98	mm
Head rotation	-2.7260	mrad
Maximum moment	145.6	kN-m
Depth of max moment	2.85	m
Maximum shear	100.0	kN
Maximum deflection	7.98	mm
Depth of zero deflection	4.90	m

1. FIGURES

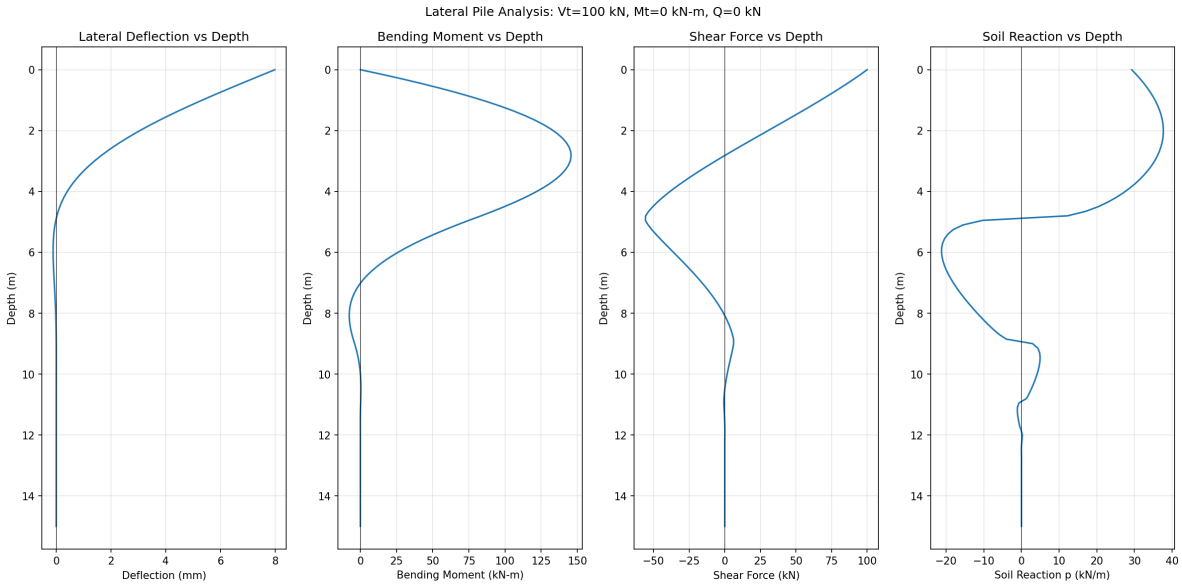

Figure 1: *

Figure 1: Deflection, bending moment, shear force, and soil reaction profiles along the pile (V_t = 100 kN, M_t = 0 kN-m, Q = 0 kN).

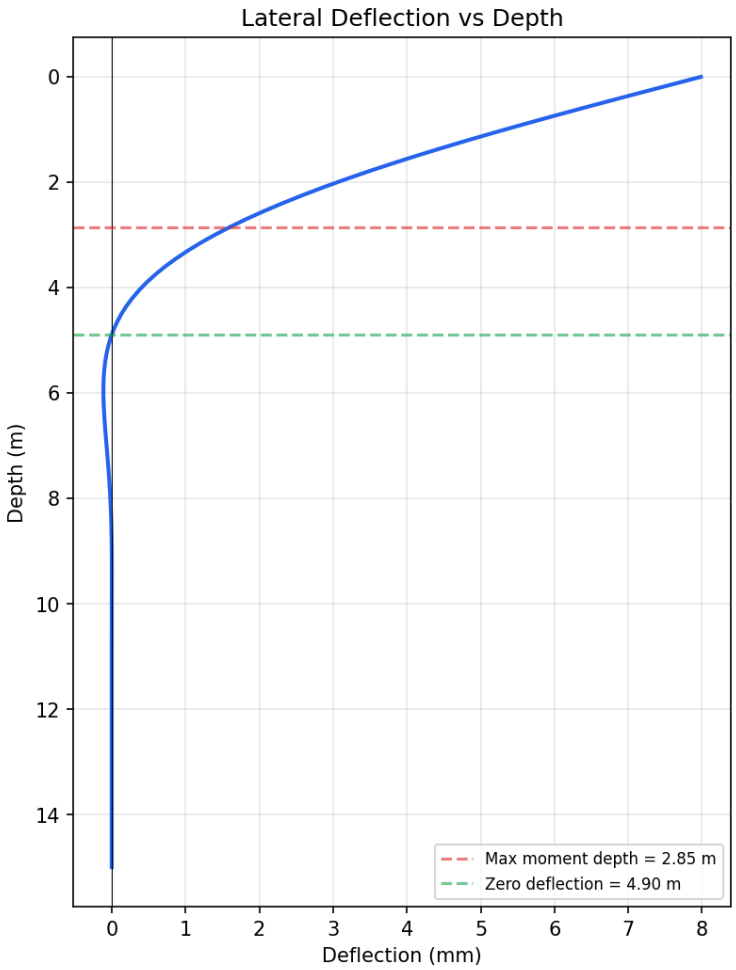

Figure 2: *
Figure 2: Detailed deflection profile. Head deflection = 7.98 mm.

1. REFERENCES

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5. API RP 2GEO (2014). Geotechnical and Foundation Design Considerations.
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