Pipeline Crossing Design Report

Project Details

Report Date: June 06, 2025 16:13:39

Generated By: Shivesh

Project Title: Pipeline Crossing Project

1. Input Parameters

Parameter	Value	Unit
Pipe Outside Diameter	1016.0	mm
Pipe Wall Thickness	10.0	mm
SMYS	195.0	MPa
Depth of Cover	1.5	m
Corrosion Allowance	0.0	mm
Operating Pressure	0.0	MPa
Operating Temperature	40.0	°C
Impact Factor	1.5	-
Design Wheel Load (Single Axle)	53.4	kN
Soil Unit Weight	18.9	kN/m³
Design Factor	0.72	-
Design Wheel Load (Tandem Axle)	44.5	kN
Modulus of Soil Reaction	3.4	MPa
Longitudinal Joint Factor	1.0	-
Young's Modulus	210000.0	MPa
Resilient Modulus	34.0	MPa
Installation Temperature	65.0	°C
Poisson's Ratio	0.3	-
Coeff. of Thermal Expansion	1.44e-05	/°C
Earth Load Stiffness Factor	6330.0	-
Earth Load Burial Factor	0.47	-
Earth Load Excavation Factor	0.91	-
Stiffness Factor K_Hh	19.8	-
Geometry Factor G_Hh	0.7	-
Stiffness Factor K_Lh	14.8	-

Geometry Factor G_Lh	0.64	-
Road Axle Configuration Factor	1.0	-
Road Pavement Type Factor	1.0	-
Fatigue Endurance (Girth Yield)	82.737	MPa
Fatigue Endurance (Long. Weld)	158.57	MPa
Pipe Type	SMLS	-
Bored Diameter Option	Considered	-
Soil Type	Soft to medium clay	-
Steel Grade	Fe 330	-
Codes & Standards	API 1102	-

2. Calculation Results

Output Parameter	Value	Unit
Pipe Wall Thickness (incl. CA)	10.000	mm
Bored Diameter	1067.000	mm
Barlow Stress	0.000	MPa
Stress due to Earth Load	51.987	MPa
Cyclic Circumferential Stress	9.938	MPa
Cyclic Longitudinal Stress	6.791	MPa
Radial Stress	0.000	MPa
Circumferential Stress (S1)	61.925	MPa
Longitudinal Stress (S2)	97.987	MPa
Effective Stress (S_eff)	85.839	MPa
Barlow Stress Check	Allowable	-
Principle Stress Check	Allowable	-
Girth Weld Criteria Check	Allowable	-
Longitudinal Weld Criteria Check	Allowable	-