

Wheel Load Analysis Report

H-20 / HS-20 Highway Live Load Analysis per AASHTO

PROJECT NAME

Demo - Case #1

CLIENT

ABC Pipeline

CALCULATED BY

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DATE

June 29, 2026

PIPELINE WHEEL LOAD ANALYSIS REPORT

API RP 1102 Track Equipment Crossing Analysis

Generated: June 29, 2026 at 09:41 PM

1. EXECUTIVE SUMMARY

COMPLIANCE STATUS

PASS

Combined Stress: 47.2% SMYS
Max Allowable: 60% SMYS

1.1 Analysis Summary

Pipeline Specification

OD × WT: 16.000 × 0.375 in
Grade: X52
SMYS: 52,000 psi

Installation

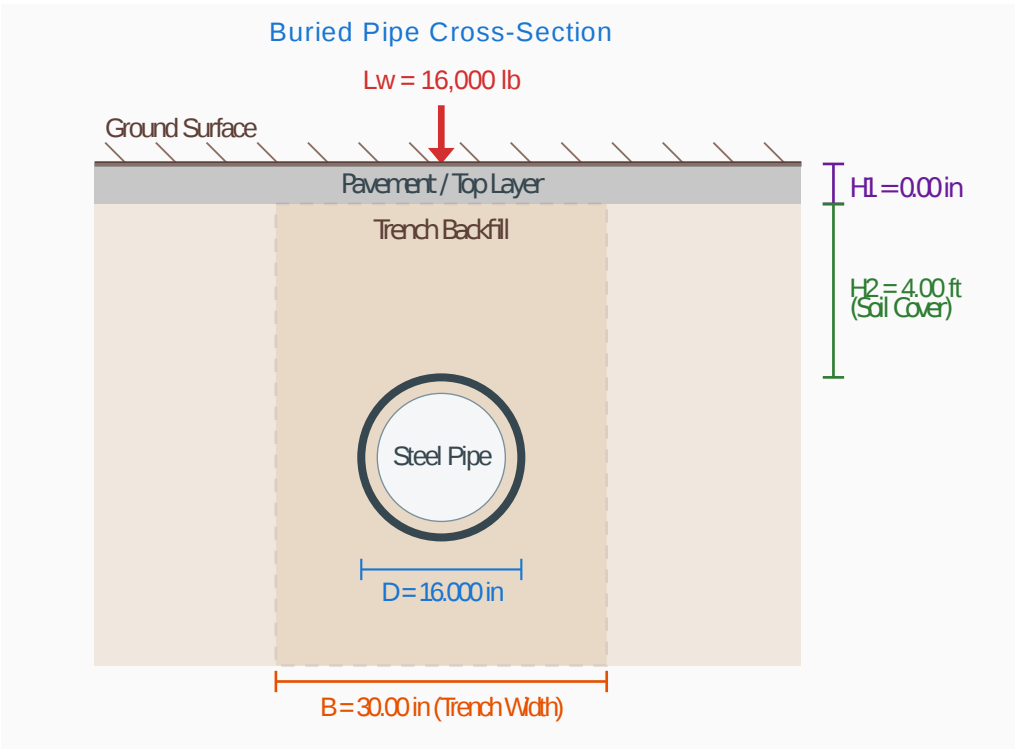
Soil Type: Clay
Crossing Type: Open Cut
Soil Cover (H2): 4.00 ft
Pavement (H1): 0.00 in
Trench Width: 30.00 in

1.2 Input Parameters

Parameter	Symbol	Value	Unit
Outside Diameter	D	16.000	inches
Wall Thickness	t	0.375	inches
SMYS	S	52,000	psi
Internal Pressure	P	790	psi
Depth of Soil Cover	H ₂	4.00	ft
Thickness of Pavement Layer	H ₁	0.00	inches
Trench Width	B	30.00	inches
Backfill Density	D _s	120.0	lb/ft ³
Concentrated Surface Load	L_w	16,000	lbs

2. VISUAL REFERENCE — BURIED PIPE CROSS-SECTION

The following diagram illustrates the buried pipe cross-section, showing the concentrated surface load (L_w), pavement thickness (H_1), depth of soil cover (H_2), trench width (B), and pipe outside diameter (D).



Key Parameters

Soil Cover (H_2): 4.00 ft

Pavement (H_1): 0.00 in

Pipe OD (D): 16.000 in

3. CALCULATIONS

3.1 Load Calculations

Parameter	Symbol	Value	Unit
Load Coefficient	Cd	1.3090	-
Load due to Overburden	Wc	N/A	lb/ft
Influence Factor m	m	N/A	-
Influence Factor n	n	N/A	-
Influence Coefficient	Ic	N/A	-
Max Static Pressure	Qd	N/A	psi
Total Track Load	Wt	N/A	lb/ft
Total Load	Wtotal	161	lb/ft

3.2 Stress Analysis

Parameter	Symbol	Value	Unit
Hoop Stress	Sh	16,853	psi
Circumferential Stress	Sc	7,674	psi
Total Circumferential Stress	St	N/A	psi
Longitudinal Bending Stress	Sb	N/A	psi
Combined Stress	S	N/A	psi (47.2% SMYS)

3.3 Compliance Check

Check Item	Actual	Allowable	Utilization	Status
Combined Stress vs Allowable	47.2% SMYS	60% SMYS	0.786	PASS

4. CONCLUSIONS AND RECOMMENDATIONS

Wheel Load Analysis Verification

The pipeline crossing meets all wheel load stress requirements

- Combined stress (47.2% SMYS) is within the allowable limit (60% SMYS)
- The pipeline is adequate for the specified track equipment crossing

Construction Recommendations

1. Maintain minimum soil cover depth of 4.00 ft during construction
2. Use proper backfill material and compaction procedures
3. Restrict equipment crossing to specified track equipment only
4. Monitor pipeline for settlement after construction
5. Conduct post-construction integrity verification per API RP 1102