

Settlement Analysis Report

Ground Surface Settlement Due to HDD Operations

PROJECT NAME

Demo - Case #1

CLIENT

ABC Pipeline

CALCULATED BY

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DATE

June 29, 2026

SETTLEMENT ANALYSIS REPORT

Trenchless Installation Ground Surface Settlement
Inverted Gaussian Distribution Method

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EXECUTIVE SUMMARY

Maximum Ground Surface Settlement

0.829 inches

At Centerline Above Bore

Key Metrics

Trough Half-Width (w)	12.80 ft
Total Affected Width	25.6 ft
Settlement Volume (Vs)	0.8836 ft3/ft

Assessment

Classification	REQUIRES REVIEW
Bore Depth	20.0 ft
Soil Correction (C)	0.50

INPUT PARAMETERS

Parameter	Value	Unit
Diameter of Product Pipe (Dpipe)	24.0	inches
Diameter of Bore (Dhole)	30.0	inches
Depth to Bore Centerline (h)	20.0	feet
Soil Friction Angle (phi)	30	degrees
Settlement Correction Factor (C)	0.50	-

Soil Type Classification

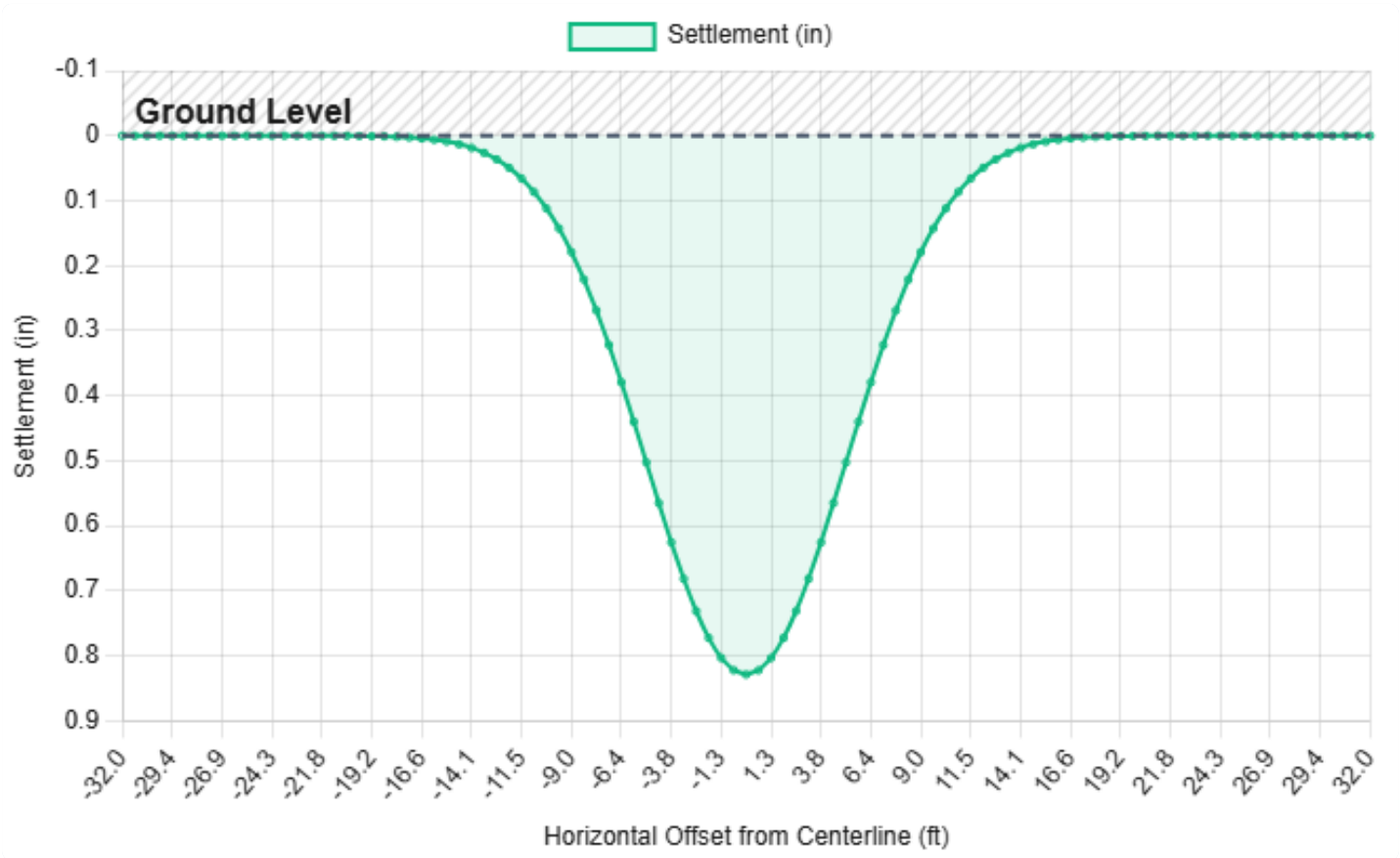
C = 0.50 corresponds to: Medium Clay, Medium Dense Sand

SETTLEMENT ANALYSIS REPORT

Settlement Trough Profile and Conclusions

SETTLEMENT TROUGH PROFILE

Ground Surface Settlement vs. Horizontal Offset from Centerline



CONCLUSIONS AND RECOMMENDATIONS

Settlement Assessment: **REQUIRES REVIEW**

The predicted settlement exceeds typical allowable limits for sensitive structures. Detailed evaluation of nearby utilities and structures is required. Consider reducing bore diameter, increasing depth, or implementing ground improvement measures.

Key findings:

- Maximum predicted settlement: 0.829 inches at bore centerline
- Settlement trough extends approximately 25.6 feet across the ground surface
- Settlement correction factor of 0.50 applied (Medium Clay, Medium Dense Sand)
- Bore depth of 20.0 ft with 30 in bore and 24 in product pipe

Disclaimer: This analysis is based on the inverted Gaussian distribution method for predicting ground surface settlement above trenchless installations. Results are theoretical estimates based on input parameters and empirical correlations. Actual settlement may vary due to site-specific soil conditions, groundwater, installation techniques, and other factors. A qualified geotechnical engineer should review the results for final design decisions.