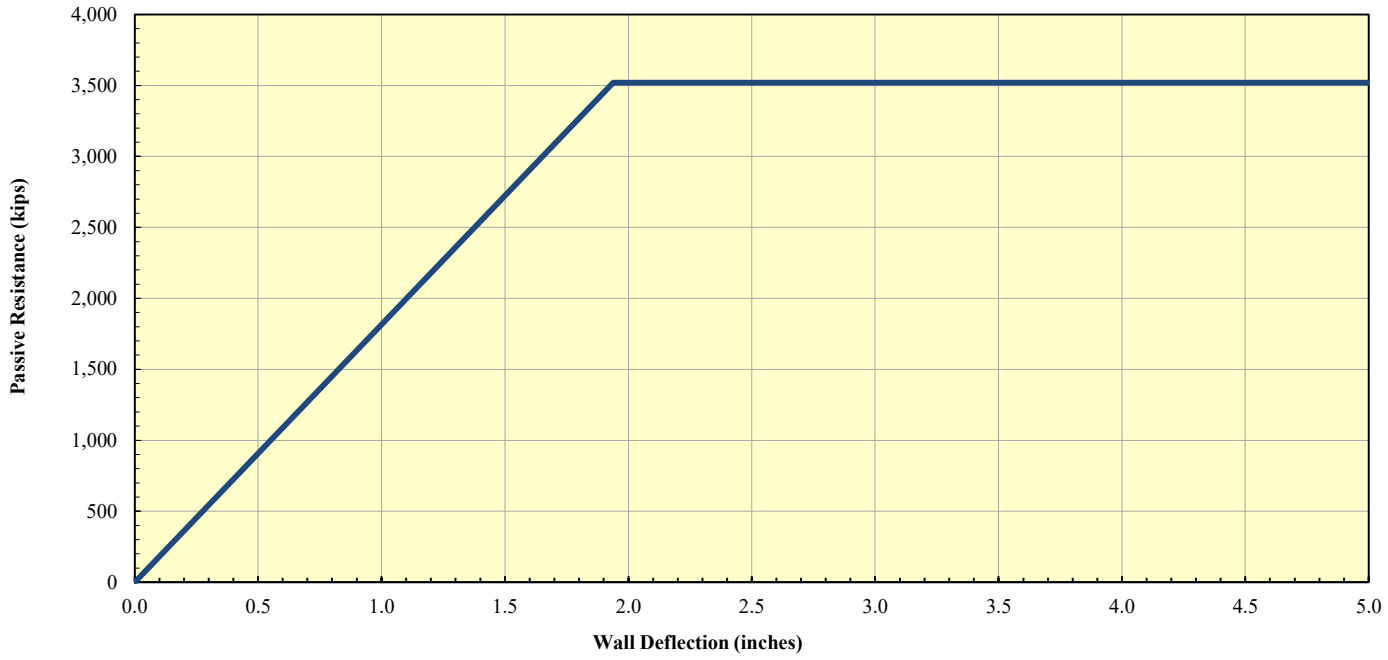
ANALYSIS OF LONGITUDINAL STIFFNESS OF A BRIDGE ABUTMENT WALL

PROJECT INFORMATION	
Project Name	
Project No.	
Project Location	
Analyzed By	
Reviewed By	

INPUT PARAMETERS	
Abutment Type	Seat Abutment
Abutment Backwall or Diaphragm Height, H	10.00 feet
Abutment Wall Width, w	50.00 feet
Expansion Hinge Gap, Δ_{gap}	1.00 inches
Abutment Skew Angle, θ	0.00 degrees

COMPUTED PARAMETERS	
Skew Reduction Factor, R_{sk}	1.00
Idealized Ultimate Passive Capacity of the Backfill, F_{abut}	3,520.75 kips
Abutment Longitudinal Stiffness, K_{abut}	3,750.00 kips/in.
Abutment Displacement at Idealized Yield, Δ_{abut}	0.94 inches
Effective Abutment Longitudinal Displacement, Δ_{eff}	1.94 inches
Effective Abutment Longitudinal Stiffness, K_{eff}	1,815.88 kips/in.

PASSIVE RESISTANCE - DEFLECTION RESPONSE CURVE



REFERENCES:

1. Applied Technology Council and Multidisciplinary Center for Earthquake Engineering Research, 2003, "Recommended LRFD guidelines for the seismic design of highway bridges," MCEER/ATC 49, Buffalo, NY, USA.
2. Khalili-Tehrani, P., Taciroglu, E. and Shamsabadi, A., 2010, "Backbone curves for passive lateral response of walls with homogeneous backfills," Published in Soil-Foundation Structure Interaction - Orense, Chouw & Pender (eds), Taylor & Francis Group, London, UK.
3. Caltrans Seismic Design Criteria (SDC), Version 2.0, April 2019, "Longitudinal Abutment Response", Section 6.3.1, pp. 6-23 to 6-27.