TRULINE®

Load Test without Concrete

The Innovative Hybrid Sheet Piling System

Test Setup

Dimensions

8 ft. high from ground level by approx. 16 ft. wide — wall was 7 ft. above improvised mud line.

Tie-Backs

Two tie-backs (1" diameter steel rods with 1"-8 UNC threads by 7" long on each end) were inserted through 1-1/16" holes in the wall and through a 12" long C4 x 7.25# steel channel to provide a bearing surface on the seaward side of the wall. The rods were fastened using a 2½" OD by ⅛" thick washer and hex nut. The land side of the rods were welded to a rigid steel framework to prevent movement and placed maximum force on the polymer wall itself.

Fill

Each section of the wall was filled with AASHTO #57 stone aggregate to within 6" of the top of the wall.

Mud Line

A 12" steel I-beam was welded next to the bottom of the wall on the seaward side to duplicate a mud line 7 ft. down from the top of the wall. An 8" steel angle was placed ¾" away from the bottom of the soil side of the wall to prevent the wall from recoiling during failure.

Concrete Cap

To duplicate the concrete cap, a structural steel channel with the same section properties as a transformed concrete-steel cap section (C12 x 30#) was attached to the top of the wall by welding ¾" x 6" long steel studs to the underside of the channel at the approximate center of each u-channel. The remaining 6" of the u-channels were filled with high early-strength concrete and the steel channel was placed on top of the wall, embedding the studs in the concrete.

Loading

Loading on actual retention walls is known to be triangular starting from zero at the top of the wall and increasing to a maximum at the mud line. To replicate this loading, two rigid steel tubes were placed 25 in. and 63 in. below the top edge. The top tube was loaded with two cylinders and the bottom tube was loaded with four so that the bottom load was always twice the top load. All cylinders were connected to a single manifold and pump so that they all generated equal force. (See Loading Diagram)

Test Data Measurement

Deflection of the wall was measured in six locations using linear displacement transducers mounted to independent reference frames. Hydraulic pressure was measured and converted to force using the effective area of the cylinders. Readings were recorded every 10 seconds.

Procedure

The wall was loaded to the desired level and held for one minute. The pressure was relieved and the wall was allowed to recover for one minute. After four loads were tested, the force on the wall was increased to levels that would exceed forces expected in real applications to observe and record performance data.

setup shown from landside view

setup shown from seaside view

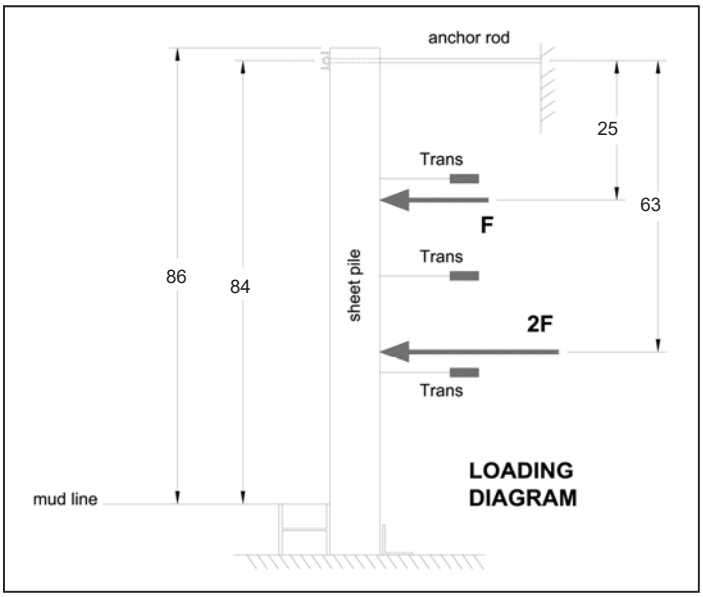
mud line duplication

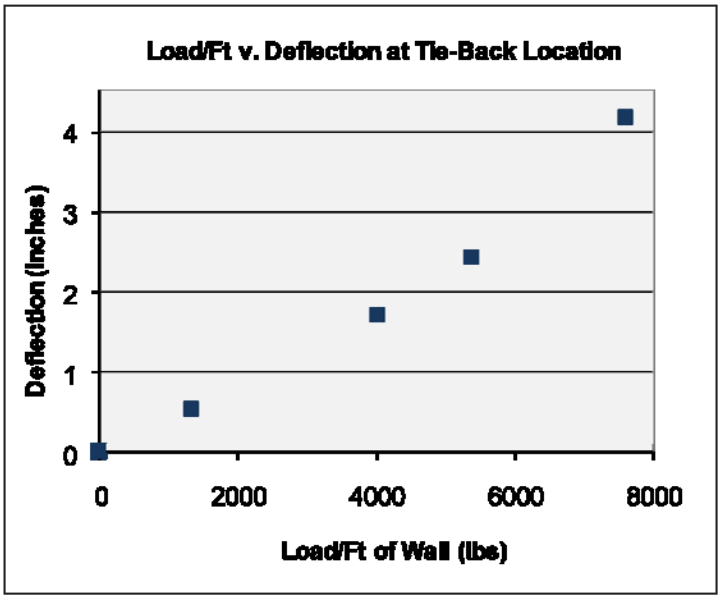
rock fill and tie rod placement

hydraulic cylinders and transducers

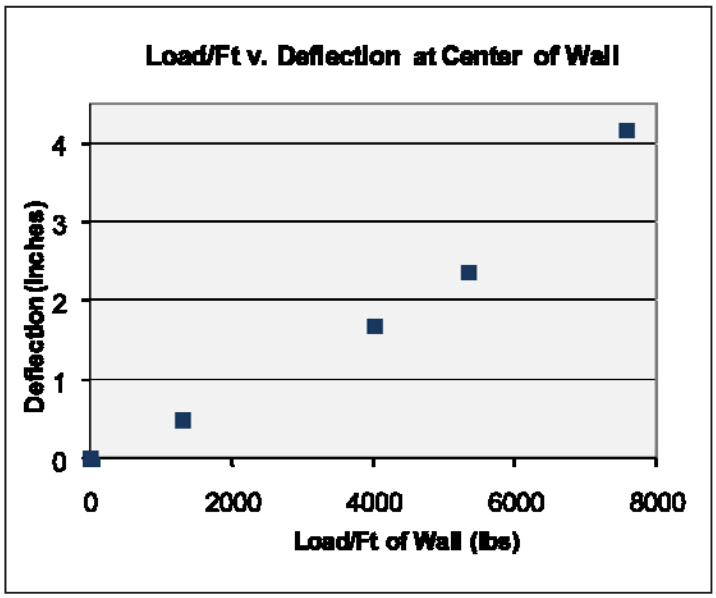
side view of setup

800 Series Test Results





Results Summary			
Applied Load per Foot of Wall (Distributed as shown in diagram above)	Max Deflection	Calculated Shear at Mud Line	Calculated Moment (max)
lbs / ft	in	lbs / ft	ft · lbs/ft
1325	0.53	775	1485
4027	1.70	2357	4515
5375	2.42	3146	6028
7599	4.16	4447	8517



Architectural Testing

Test Results — Report No. 70174.01-122-44
February 2007

This performance test was conducted by **Architectural Testing, Inc.,** a premier testing lab with a reputation for accuracy and integrity that attracts the world's top manufacturers of windows, doors, roofing and more. Location: 130 Derry Court, York, PA 17402, Phone (717) 764-7700.