

# TBWall Report

## Project Information

Designed By  
 Organization  
 Date 5/4/2010  
 Project  
 Job #  
 Client

**Number of Tieback Levels** Four

**Units System** ft

## Geometry

a 5.0 ft  
 b 12.0 ft  
 c 12.0 ft  
 d 12.0 ft  
 e 12.0 ft  
 h 53.0 ft  
 L 58.3 ft

## Properties

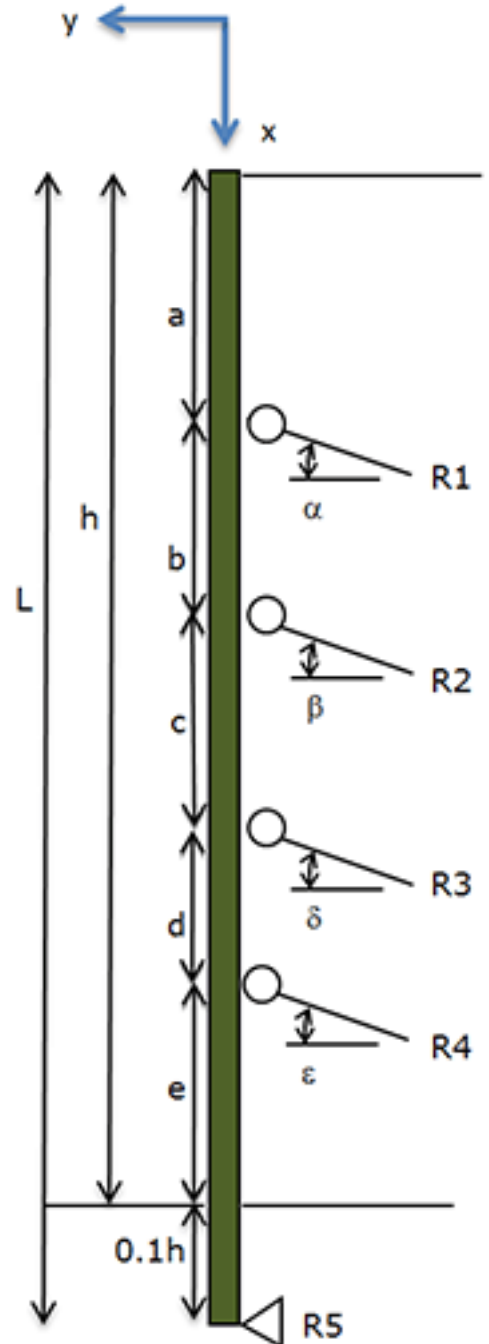
E 29000 ksi  
 fy 50 ksi

**Max. Deflection** 0.5 in

**Beam Shape** W16X57

## Tieback Data

Angle1 15  
 Angle2 15  
 Angle3 15  
 Angle4 15



## Design Philosophy

The analysis is based on "Equivalent Beam Method" first proposed by Blum and explained in detail in "Foundation Design" Teng, 1962, 1st & only edition or in "Foundation Engineering" Jumikis, 1987 2nd ed.

The design is based on classical structural analysis:

- \* This program uses classic-beam-theory beam elements to solve the multispans tieback design.
- \* The equivalent nodal loads for each span are determined by numerical integration of the beam equations to allow for the non uniform loads.
- \* The equivalent nodal loads, the stiffness matrix, and the support conditions are used to solve for the support reactions and the support rotations.
- \* The support reactions are then used to numerically integrate the entire span for values to display in the plots, and to find the max/min values.
- \* Steel Shapes only include compact sections, If noncompact sections are desired, additional design checks are required.
- \* The deflection output is based on structural analysis but an independent check should be made by Finite Element method or by site surveying.

Reaction 1	Reaction 2	Reaction 3	Reaction 4	Reaction 5
-24.33 kips	-76.07 kips	-68.08 kips	-74.38 kips	-10.04 kips

Maximum Shear	38.7 kip at 17.00 ft
Maximum Moment	93.9 kip-at 41.00 ft
Maximum Deflection	-0.1065 in at 50.17 ft

Required Aw	1.93 in <sup>2</sup>	Adequate for Shear
Required Zx	37.65 in <sup>3</sup>	Adequate for Bending
Utilized Ix	21%	Adequate for Deflection

	R1	R2	R3	R4
Tieback Force	25.2 kips	78.8 kips	70.5 kips	77.0 kips
Unbonded Tieback Length	32.7 ft	25.8 ft	18.9 ft	15.0 ft
Test Load	33.5 kips	104.7 kips	93.7 kips	102.4 kips

#### Lateral Torsional Buckling Check

Lb	3 in
Cb	1
ry	1.60 in
ly	43.10 in <sup>4</sup>
h0	15.68 in
J	2.22 in <sup>4</sup>
rts	1.9 in
Lp	67.8 in
Lr	219.4 in
Fcr	116606 ksi
Mn/Q	262 kip-ft

#### Axially-Loaded Member Check

P	30 kips
L	5 ft
K	0.8
A	16.8 in <sup>2</sup>
KL/r	30.0
Fe	318 ksi
Fcr	47 ksi
Pn/Q	471 kips

Required Embedment	32.33 ft
Tschebotarioff Check	28.09 ft

Combined Forces Utilization	39%
-----------------------------	-----

