

Organization
 Designed By
 Date 7/2/2017

Client
 Project
 Job #

TBWall Report

Project Information

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Number of Tieback Levels Two

Units System ft

Geometry

a 7.0 ft
 b 10.8 ft
 c 12.8 ft

 h 30.5 ft
 L 33.5 ft

Properties

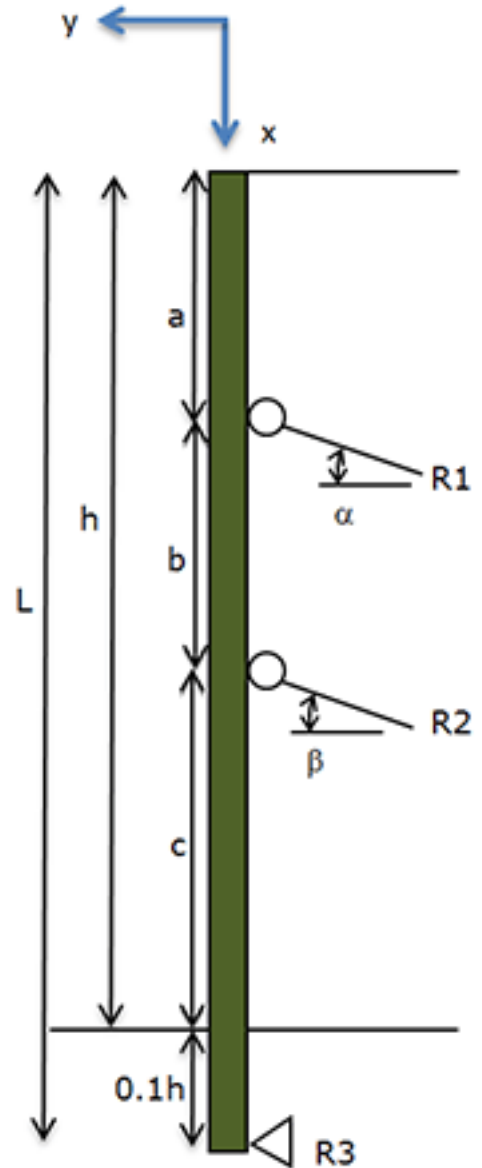
E 29000 ksi
 fy 50 ksi

Max. Deflection 0.7 in

Beam Shape W16X57

Tieback Data

Angle1 20
 Angle2 20



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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.

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Reaction 1	Reaction 2	Reaction 3
-63.71 kips	-69.63 kips	-33.08 kips

Maximum Shear	-45.3 kip at 17.75 ft
Maximum Moment	121.5 kip-at 7.00 ft
Maximum Deflection	-0.3105 in at 0.00 ft

Required Aw	2.26 in ²	Adequate for Shear
Required Zx	48.71 in ³	Adequate for Bending
Utilized Ix	46%	Adequate for Deflection

	R1	R2
Tieback Force	67.8 kips	74.1 kips
Unbonded Tieback Length	18.6 ft	15.0 ft
Test Load	90.2 kips	98.5 kips

Lateral Torsional Buckling Check

Lb	153 in
Cb	1
ry	1.60 in
ly	43.10 in ⁴
h0	15.68 in
J	2.22 in ⁴
rts	1.9 in
Lp	67.8 in
Lr	219.4 in
Fcr	60 ksi
Mn/Q	205 kip-ft

Axially-Loaded Member Check

P	0 kips
L	13 ft
K	0.8
A	16.8 in ²
KL/r	76.5
Fe	49 ksi
Fcr	33 ksi
Pn/Q	328 kips

Required Embedment	18.61 ft
Tschebotarioff Check	16.16 ft

Combined Forces Utilization	59%
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