TBWall Report

Project Information
Designed By
Organization
Date 7/2/2017
Project
Job #
Client

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
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
-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 in²  Adequate for Shear
Required Zx  48.71 in³  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  Axially-Loaded Member Check
Lb  153 in
Cb  1
ry  1.60 in
Ly  43.10 in⁴
h0  15.68 in
J  2.22 in⁴
rts  1.9 in
Lp  67.8 in
Lr  219.4 in
Fcr  60 ksi
Mn/Q  205 kip-ft
P  0 kips
L  13 ft
K  0.8
A  16.8 in²
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%