

INTRODUCTION

INTRODUCTION

What is Seismic Bracing?

Seismic forces are exerted on a building and its contents during an earthquake. These forces act horizontally upon the structure itself, as well as the piping, cable trays, ductwork, and other building systems within. Typical supports for piping, trays, and other equipment are designed for the gravity, or vertical, loads but do not take into account the horizontal loading caused by earthquakes. Seismic restraints (i.e. braces) resist the horizontal forces and keep the systems in place and secure. The main purpose of seismic bracing is safety- to minimize the loss of life due to an earthquake.

Seismic Bracing Requirements

The rules and requirements for the seismic restraints are published in the model building codes: The **Uniform Building Code** (International Conference of Building Officials), **National Building Code** (**B**uilding **O**fficials and **C**ode **A**dministrators), **Standard Building Code** (Southern Building Code Congress International), and the International Building Code. Each code is similar in nature, and has a chapter on structural forces which defines the level of seismic force that must be used in the design of seismic restraints.

The amount of seismic force (as determined by the building code) is given as a percent of the components' weight, or g-force. If the horizontal force is determined to be 50 percent of the piping weight, for example, the seismic force is .5g.

The seismic "g-value" can vary greatly depending on the nature of the project. Critical buildings in a high seismic zone have larger g-value requirements than warehouses in zone 1.

Factors that govern the seismic g-values used for design:

- Seismic Zone
- Building Type
- Elevation within building
- System being braced
- Soil Type
- Distance from known faults
- Anchorage Type

The design professional should use these factors and the applicable building code requirements to determine the proper g-values to be used for the project.

This manual has been developed under the requirements of the 2001 California Building Code, and contains seismic bracing details that can be used for seismic bracing projects up to 1.0g (ASD) or 1.4g. The brace spacing charts, required details, and rod loads must be determined for the specific g-value for the project and shall be submitted to the engineer of record prior to construction. The determination of the seismic force level shall also be submitted to the engineer of record and to OSHPD for hospital projects in the state of California prior to construction. However, the seismic force level need not be submitted to the engineer of record or OSHPD if included in the original construction documents. This brochure contains charts for a variety of g values, however custom charts can be created to reflect different g-values as required for the project. Contact B-Line Engineering at 618-654-2184 with your requirements.

A copy of the complete Seismic Restraints Manual shall be on the jobsite for the duration of the project. Appropriate shop drawings signed/stamped by the architect or engineer of record must also be kept. OSHPD reserves the right to review these upon request.



B-Line

COOPER B-Line
509 West Monroe Street
Highland, Illinois 62249
Phone: 800-851-7415
Fax: 618-654-1917

Date:

6 - 2 - 06

Page No.

i

Sheet Number:

___ of ___



Raafat S. Aboulhosa
Structural Engineer

S 3913