



## CONTENTS

Front Matter

Foreword

List of Sections With New Information

List of Abbreviations and Symbols

- 1.0 Work Space, Access to Equipment and Materials, and the Use of Wood and Other Combustible Materials
- 2.0 Railings
- 3.0 Stairways, Ramps, Stiles, Walkways, and Platforms
- 4.0 Ladders
- 5.0 Guards: Mechanical, Hot Surface, and Chemical Spray
- 6.0 Electrical Equipment
- 7.0 Rigging Practices
- 8.0 Scaffolds
- 9.0 Access for Physically Disabled Employees
- 10.0 Safety Shower/Eye-Wash Units and Chemical Hazards
- 11.0 Ventilation
- 12.0 Miscellaneous



## FOREWORD

*Safety In Designs* provides a summary of legal standards and Company guidelines relating to safe facility design, along with cost-effective recommendations for meeting them. The figures show, in a simplified manner, how to design and fabricate facilities that incorporate these standards and guidelines.

*Safety In Designs* is most effectively used when building new facilities or modifying/upgrading existing facilities. Existing facilities that are safe and meet legal requirements are not expected to be modified to meet this edition of *Safety In Designs*.

The design of safe and complying facilities is the responsibility of local management. *Safety In Designs* is a tool to help meet this objective.

The basis for *Safety In Designs* is OSHA requirements augmented in certain cases by Company recommendations based on industry practice and Chevron experience. Two examples are:

- Recommended handrail details (Section 2.2, *Figure 2.1*) show practical, cost-effective means to design handrails to avoid sharp corners and catch points that can snag clothing or cause slips, trips and hand injuries. OSHA standards do not address these details.
- Recommended dimension for ladder cages (Section 4.4 B) is 30 inches (compared to the OSHA minimum of 28 inches) since some people experience clearance problems when climbing an OSHA-minimum ladder while wearing self-contained breathing apparatus.

### NOTES:

1. This edition of *Safety In Designs* provides the following new features to better inform the reader on the subject of design safety:
  - A. OSHA Standards: Where appropriate, Federal and California OSHA standards corresponding to each section are paraphrased in the margins for reference. Refer to the current OSHA standard for exact wording.
  - B. OSHA Interpretations: In some cases OSHA has issued letters of interpretation. When applicable, these interpretations have been included in the margin with the regulation as an additional reference.
  - C. Chevron Interpretations: In some cases, a Chevron interpretation is given based on letters of interpretation on a related issue, or based on legal decisions.
2. This manual does not contain complete fabrication or construction details. Please refer to applicable Standard Drawings or other Company publications for this information.

3. Terms used in this manual:
  - A. *Shall, is required, or must* either means a legal requirement (as described in the margin summary), or is a company recommendation that generally should be followed unless an analysis shows that comparable safety is provided by alternate methods.
  - B. *Should* means an advisory recommendation which is applicable in most cases, but is not required.
  - C. *Preferred or Recommended* denotes a recommendation that has been generally and successfully used within the Company, but there are other choices and methods which are acceptable.
4. Revisions: This manual will be revised as new regulations are promulgated and new designs developed. Please use the form in the front of this manual to suggest changes and new information that will make *Safety In Designs* more useful.
5. An asterisk (\*) after a section of text indicates that the information in that section is new or revised as of September 1996.



## LIST OF SECTIONS WITH NEW INFORMATION

This manual contains information which is new or revised for the 1996 version of *Safety In Designs*. This information is designated in each section by an asterisk (\*). The chart below lists the relevant section and page numbers.

<u>Section</u>	<u>Title/ Subsection Containing New Information</u>	<u>Page Numbers</u>
<b>1.0</b>	<b>Work Space, Access to Equipment and Materials, and the Use of Wood and Other Combustible Materials</b>	
	1.2 Conditions Which Require Safe Access	1-2
	1.3 Access to Equipment and Materials	1-3, 1-4
	1.4 Means of Egress	1-8
<b>2.0</b>	<b>General Requirements for Guard Railing, Stair Railing, and Toeboards</b>	
	2.2 Conditions Which Require Guard Railing	2-2
	2.3 Safety Design Requirements for Guard Railings and Toeboards	2-6, 2-7
	2.4 Steel Guard Railing	2-8
<b>3.0</b>	<b>Stairways, Ramps, Stiles, Walkways, and Platforms</b>	
	3.3 Design Requirements for Stairways	3-3, 3-8
	3.4 General Requirements for Steel Ramps, Stiles, Walkways and Platforms	3-12
	3.8 Requirements for Wood Construction	3-30, 3-31
<b>4.0</b>	<b>Ladders</b>	
	4.2 All Fixed Ladders	4-3, 4-4
	4.4 Fall Protection Features	4-10
<b>5.0</b>	<b>Guards: Mechanical, Hot Surface and Chemical Spray</b>	
	5.3 Approved Materials for Guards	5-7
	5.8 Protecting Personnel from Hot or Cold Surfaces	5-21
<b>6.0</b>	<b>Electrical Equipment</b>	
	6.2 General Requirements for Electrical Equipment	6-2
	6.3 Working Spaces About Electrical Equipment - General	6-3
	6.4 Working Spaces About Electrical Equipment - 600 Volts or More	6-5



<u>Section</u>	<u>Title/ Subsection Containing New Information</u>	<u>Page Numbers</u>
	6.5 Definitions of Hazardous Locations	6-6
	6.6 Classification of Equipment	6-11
	6.7 Marking of Underground Electrical Installations	6-13
<b>10.0</b>	<b>Safety Shower/Eye-Wash Units and Chemical Hazards</b>	
	10.3 Hazardous Chemicals	10-12, 10-13
<b>12.0</b>	<b>Miscellaneous</b>	
	12.3 Identification and Labeling of Pipelines and Equipment	12-8



## LIST OF ABBREVIATIONS AND SYMBOLS

### ABBREVIATIONS

AWS	American Welding Society
B.O.L.	Bottom of Line
CU.YD	Cubic Yard
EQUIV	Equivalent
FL.	Floor
FT.	Foot or Feet
GA.	Gauge
I.D.	Inside Diameter or Inside Dimension
IWRC	Independent Wire Rope Core
LB. (S)	Pound(s)
LIN. FT.	Linear Foot (Feet)
MAX.	Maximum
MIN.	Minimum
PSF	Pounds per Square Foot
REF.	Reference
S4S	Surfaced Four Sides
SQ.	Square
SCHED.	Schedule
ST'D DWG	Standard Drawing
ST'L.	Steel
TYP.	Typical

### SYMBOLS

∠	Angle
└	Angle, Structural Steel
@	At
⊘	Center Line
C-C	Center to Center
C	Channel, Structural Steel
φ	Diameter
°F	Degrees Fahrenheit
%	Percent
#	Pounds
⌞	Plate
R	Radius
	10" Rise, 12" Run for Pitch or Angle to Vertical