U.S. Army Corps of Engineers
Urban Search and Rescue Program

Urban Search & Rescue Structures Specialist

FIELD OPERATIONS GUIDE

7th Edition
To be Completed by September 2012

US&R STRUCTURES SPECIALIST
FIELD OPERATIONS GUIDE (FOG)

FOREWORD

This Field Operations Guide (FOG) was developed by the FEMA US&R Structures Sub-group in cooperation with U.S. Army Corps of Engineers (USACE), as a working reference tool for US&R Rescue Team Personnel, especially Structures Specialists (StS), during response operations. It condenses information provided during training, and was designed to be expanded to incorporate new information.

In this FOG, Sections 1 through 4 are identical to the same sections of the smaller US&R Shoring Operations Guide (SOG). That SOG is intended for use of Rescue Specialists in constructing shoring and other Rescue Operations. In addition to the first 4 Sections, this FOG contains Equipment Operation Procedures, Operational Check Lists, Engineering Data, Tables and Forms that make it a more useful Reference for the StS.

Users are encouraged to suggest changes that can be incorporated into future editions of this FOG. Suggestions should be made to:

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This Publication is intended for the use of US&R Structures Specialists and Rescue Team Personnel. It may be printed by them, or their organizations, for their use.

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DEFINITIONS of ENGINEERING TERMS

Kips or K – 1000 pounds

Tons or T – 2000 pounds

Breaking Strength – Force required to cause complete failure of a structure, given in pounds, Kips or Tons, usually associated with Wire Rope

Ultimate Strength (also Ultimate Load & Ultimate Capacity) – Force required to cause complete failure of a structure, given in pounds or Kips

Design Load (also **Design Strength** & **Design Capacity**) – Some fraction of Ultimate Strength that is used to determine the Size or Number of Structural Components (posts, etc.) to support a Load at Low Risk of Collapse

Working Load, **Safe Working Load** – same as **Design Load**

Design Factor, Safety Factor – Ultimate Strength divided by Design Load. This Factor may be as high as 10 to 20 when using Wire Rope or Climbing Rope to suspend humans. For most building structures, it is narmally not less than about 3

Design Factor for Wood Structures – due to the variation in the quality of any grade and species of wood it is difficult to predict the Design Factor for any individual shore built using the guidelines of this document.

- The Shoring Squad must attempt to select the Posts for straightness of grain and minimum number of knots.
- The Lumber should be good quality Douglas Fir or Southern Pine (if not the reductions in strength noted in Sect 4, FAQ, should be applied). Note that pressure treating D. Fir & So. Pine does not reduce strength.
- When nailing 2x lumber with 16d nails one must avoid splitting in order to maintain joint integrety. In cases where 16d are closely spaced, the 16d vinyl coated cooler nail is preferred.
- For more Definitions, see Sect. 4, Glossary, of this document