Lessons in Welding from the 1985 Mexico City Earthquake

Analysis of welded rebar samples collected from earthquake ruins points out the need for a national Mexican welding code

BY L. MARTINEZ, J. L. ALBARRAN AND J. FUENTES

The Mexico City earthquake of September 1985 killed thousands of people and destroyed many buildings. The effects of the earthquake have motivated many studies by the international scientific community, especially by countries that have urban centers in high-seismicity zones. Th analysis of the destruction caused by this earthquak very valuable for improving design crite codes.

In fact, there were two 19 and the other th larger, an str unu the vibra delete

Dyn particul severely defects h joints of s failures are

This wor collected fr quake. An ar weldability. T. during the pro resistance to v predicated upor of reinforced co practical limitation by-piece or story-l to cast all the cc structure, it is impo bars throughout any able. Although there a bars, welded joints ar buildings.

Welding procedures orcing steel are well established in codes countries (Refs. 4-6). The codes usually indicate the main concerns in welding, such as chemical composition verification; V-groove, bevel or other bar end preparation; electrode selection; welder qualification; supervision inspection. In Mexico, there are companies e national oil (PEMEX) or national ele ions, that do have internal regula er, there is not a national code for cedures for reinforcing steel.

ls is highly dependent on the anganese. In lesser proportion, ments such as copper, nickel, vanadium (Ref. 7). The content also be critical. The carbon to AWS and ASTM, is given

+ %Ni/20 + %Cr/10 (1)
/10

carbon equivalent is a he weldability of steels. able when the carbon

considered in many 9-11). It is the user mical composition, welding procedure ng steel produced xample, the U. S. oduced under a composition to

an analysis will were used in parison is made with that are generally accepted. y of a set of samples of steel used in ings that collapsed is studied and related to ent reinforcement steel production in Mexico.

Welding Procedures

Local medical facilities, critical in confronting major disasters, were severely damaged in the earthquake (Ref. 1). Among these was the Hospital Juarez, an 11-story building, located in downtown Mexico City. It was built in the late 1960's and finished in 1970. During a search of the ruins, of approximately five hours, four welded butt joints in bars were found. The diameters of the bars were between 32 mm (1¼ in.) and 38 mm (1½ in.). The welds were found in different sections on the ruins, about 15 m (45 ft) distant from each other.

WELDING JOURNAL
(ISSN 0043-2296)
Volume 66 • Number 3 • March 1987

Feature Articles

Practical Welder

L. MARTINEZ, J. L. ALBARRAN and J. FUENTES are with the Institute of Physics, National University of Mexico, Mexico City.

Work supported by CONACYT-MEXICO, grant PUT/NAL/85/3219.