of the presence of the relatively inflexible repaired joints.

c. During the inspection of the different aqueducts it was found that degradation of the different components had taken place due to natural aging, root damage and erosion due to leaks.

Note, however, that these factors (subsidence, repairs and degradation) are common to all aqueducts in the city. Hence these factors by themselves do not explain why only aqueducts in the southeastern part of the metropolitan area were heavily damaged while aqueducts in other areas were not.

6.2 Distribution Systems Damage

The Michoacan earthquake caused considerable damage to both primary and secondary lines in the Federal District and the State of Mexico water distribution systems serving the metropolitan area.

6.2.1 Primary Distribution Pipelines in D.F.

Within the Federal District, most of the damage to primary distribution lines (20" diameters and larger) were in asbestos cement and concrete pipes. The breaks were reported as transverse cracks in pipes, crushing or pull-out at joints, and fracture of special pieces at valve boxes. Failures also occurred in cast iron pipelines. Some of these cast iron failures were in heavily corroded pipes in the older parts of the city. An example is a fracture of a "T" joint in a 36 in diameter pipeline shown in figure 6-13. This line was constructed at the beginning of the century and is located in a open gallery in the older part of the city. The line had survived previous strong earthquakes without damage and had experienced no significant corrosion or cracking prior to the September 1985 event.

Table 6-I presents the length, per "Delegacion", of various diameters of primary distribution lines within the Federal District. Table 6-II lists the number of breaks, per Delegacion, for various pipe diameters as well as the corresponding damage ratios.

A summary of damage information for the primary distribution system in the Federal District is presented in table 6-III. The length per diameter,

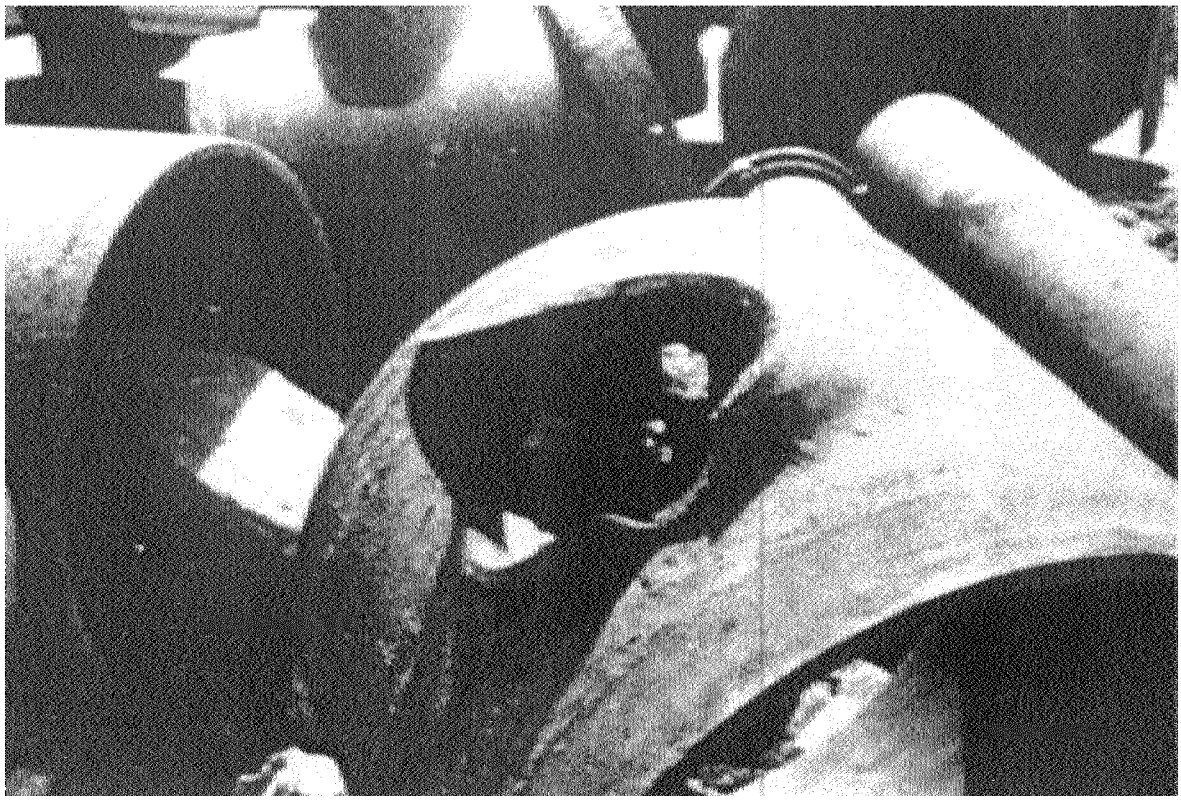

FIGURE 6-13 Fractured Cast Iron "T", 1985 Michoacan Earthquake