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PROBLEM: WHAT TYPES OF LOADS MUST BE USED TO DESIGN UNDERGROUND STRUCTURES? THIS INFORMATION IS NECESSARY BEFORE DESIGN CAN BEGIN.

I. SURFACE LOADS:

A. The most common requirement occurs when the structure is in or adjacent to a highway. Not only must the wheel load from a truck be considered but an allowance must also be made for impact caused when the wheel is traveling at high speeds. AASHTO or ASTM C890 are the references to use when choosing the right combination of wheel load and impact allowance. The most common wheel load is the AASHTO HS20 load:

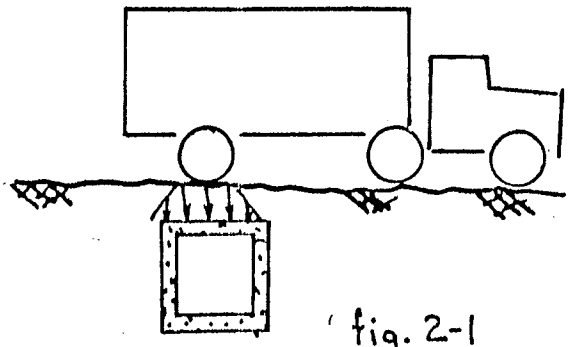

fig. 2-1

axle load = 32000 lbs. + impact
wheel load = axle load /2

B. Structures buried in parking lots can experience truck axle loads but because speed is limited allowance for impact will be minimal. Some parking lots may be too small for heavy trucks and an HS10 axle load will suffice.

C. Structures buried in fields adjacent to highways will not experience truck axle loads. It is best however to allow some load for snow, work activities etc. A suggested minimum is a load of 300 pounds per square foot (psf) as recommended by ASTM C890 for walkways.

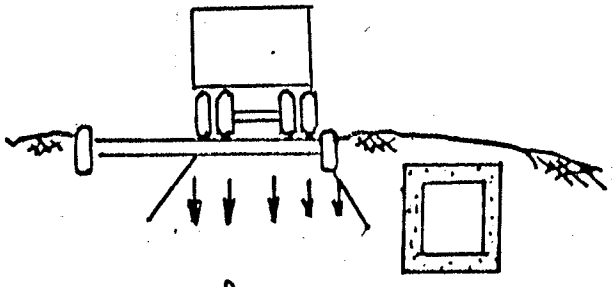

fig. 2-2

D. Some structures will be installed in or near runways at airports. The magnitude of the load depends on the type of airplanes using the airport. Structures in commercial airports handling large airplanes such as 707 jets will experience greater loads than small municipal airports that can only handle piper cub type planes.