

## CITY OF DALLAS VERTICAL CONTROL NETWORK

The City of Dallas maintains a network of vertical control monuments (called "Benchmarks") which have been established over the past 105 years throughout the Dallas Metropolitan area. The earliest surviving record is a field book that dates from 1911 titled "Street Grades," containing a record of bench marks consisting primarily of the bolts on fire hydrants or other semi-permanent municipal infrastructure components. Since these benchmarks pre-date the establishment of the nation-wide system called the "North American Vertical Datum of 1929," they are all on an assumed datum and cannot be used for city projects unless converted to the current City of Dallas datum. Beginning in 1937, the city's engineering department began to establish project benchmarks in the NAVD 1929 datum, although the monuments are of every type and the coverage is uneven. This group of benchmarks does not constitute a network, and the city does not maintain nor publish this benchmark data.

Beginning in the 1940's, the City of Dallas Water Department instituted a program to establish a city-wide network of high-accuracy benchmarks on the NAVD 1929 datum. Using a Swiss made Wild N3 Precision Geodetic Level (capable of accuracy to 0.0005 feet in a five-mile leveling run) and Invar Level Rods, the city water department crews established a network of standard benchmarks (either "Ramset" nails driven into the tops of concrete curbs or some other mark set on a fairly permanent surface) at regular intervals throughout Dallas and surrounding cities. The foray into other municipalities was necessitated because almost all the cities surrounding Dallas get their water from Dallas Water Utilities Department, and the construction of the large distribution water mains for this purpose was primarily the task of the Dallas Water Department. This is a true benchmark network, with all lines of bench loops tied together, balanced and any errors corrected. The Standard Water Department Bench Mark (WDBM) is a Ramset nail driven in to a curb, inlet, sidewalk headwall or bridge abutment has also a washer set under the nail head stamped "WDBM," though other types of high accuracy bench marks are also maintained in this network. This program is no longer maintained by any City of Dallas agency, and many of these benchmarks have been destroyed in various construction projects.

This network of high-accuracy benchmarks was created using the NAVD 1929 datum, and is the information supplied by the city to requests for vertical control monuments. All projects undertaken for the City of Dallas require that vertical control and topography be based on this network of benchmarks, and a full listing of the benchmarks (organized by MapsCo grid), their elevations and a description of their location is maintained and published by Dallas Water Utilities at the Water Utilities Vault at 320 E. Jefferson, Room 215. This list consists of a book of about 600 pages, and four addenda with listings of benchmarks set since the listing was first compiled.

Benchmark data for specific areas can be gotten from the City of Dallas Public Works & Transportation Survey Division, by calling (214) 948-4150. Though city staff can acquire the data without it, it is helpful to know the MapsCo grid for the area of interest.