

## **1105 PRESERVATION OF MONUMENTS AND MARKERS**

### **1105-1 General**

Horizontal and vertical survey controls have been placed at numerous locations throughout the State by several Federal agencies. These controls are survey monuments in the form of a concrete monument or an iron pipe with a brass cap. These agencies are the Bureau of Reclamation, Army Map Services, Corps of Engineers, Forest Service, U.S. General Land Office, Geological Survey, and the Coast and Geodetic Survey; markers of the last three being those most frequently encountered federal markers. There are also survey markers set by state, county, city and other local jurisdictions and by utility companies and professional land surveyors in the private sector. These could be brass caps, iron pipes, steel bars, rebar or just a railroad spike or large nail.

Every effort must be made to recover, protect, and preserve all such monuments, whenever and wherever found. Federal and State laws provide penalties for the negligent disturbance of all such markers and monuments. As provided in ARS 33-103 such penalties may also include the cost of surveying to reestablish the monument or marker and as a result can become very expensive.

Location crews, as a part of their preliminary engineering activity, will have located and made ties to all monuments which they were able to locate in the vicinity of the proposed work. In the case of U.S. Geological Survey or U.S. Coast and Geodetic Survey monuments, the Chief Location Engineer will have made arrangements for their relocation. This relocation will be accomplished by the Federal agency involved and/or Photogrammetry and Mapping Services prior to the beginning of any construction activities. These crews make diligent efforts to locate all in-place monuments but occasionally one may be overlooked. Refer to subsections 1105-2 and 1105-3 of this Manual in the event that construction crews locate a monument within the highway right-of-way or in an area where construction activities may disturb the monument and it has not been previously referenced.

### **1105-2 Monuments, Except U.S.G.S. or U.S. Coast & Geodetic Survey**

If the marker is outside the proposed roadway prism, reference and erect suitable protective devices and flags to insure against disturbance during construction activities. Should it be disturbed, reset in original position upon completion of project.

If it is outside the proposed paved area but within the roadway prism, establish witness corners which will enable relocation of the marker position at any future time. These points shall be iron pins approximately 18 inches (0.5 meters) in length, imbedded in concrete. By use of an instrument, set up over the original marker, locate two witness corners on a straight line passing through the original marker. Locate the other two corners similarly on another straight line turned 90 degrees off the first line. Three points shall be set at a location where they will not be disturbed during construction activities. An accurate measurement from the monument to each witness corner must be made and the distance to each recorded as a permanent project record. Send a complete diagram of the referenced monument, in duplicate, to ADOT Location Division, Phoenix. The monument and its references shall be tied to the survey centerline stationing of the roadway.

If the original monument is within the proposed paved area, it shall be preserved with a Standard Drawing C-21.10 Survey Monument and Cover. If the original corner is one established by the U.S. Land Office, the following procedure shall be used: If a stone, encase in concrete, leaving the top exposed, drilling a small hole in the stone to mark the true point. If an iron pipe with a brass cap, imbed a portion of the pipe in concrete, letting the original brass cap substitute for the one indicated in Standard Drawing C-21.10. The brass cap shall be oriented to read from south to north.

**1105-3 Monuments, U.S. Geological Survey and U.S. Coast & Geodetic Survey**

In the event such a monument has been overlooked every effort must be made to protect it in its original location. Immediate notice of location of the monument must be sent to the ADOT Chief Location Engineer, Phoenix, giving a detailed description of the marker. Enclose an impression of the marker obtained by holding a sheet of paper tightly over the face of the disk and running a soft lead pencil across the area until the imprint is transferred. The Chief Location Engineer will make prompt reply as to the action which must be taken.