

Precast Concrete Monuments

Sedimentation surveys and alignments for project works of improvements often require the placement of permanent markers for use as long-term reference monuments. The purpose of this technical note is to provide a practical method of producing precast concrete monuments.

The advantages for using precast monuments are:

1. Monuments can be mass produced in a controlled environment, such as an office work area.
2. Precasting ahead of time permits the survey work to proceed in a timely manner.
3. Field labor time is reduced, particularly where sites are inaccessible by vehicle, requiring materials to be hand carried.
4. The concrete forms, utilizing plastic PVC pipe, are re-useable.

The procedure for making pre-cast monuments is as follows.

1. Use 4-inch diameter plastic PVC pipe, with appropriate length. Monuments should be long enough to extend below the frost line. Normally this would be 24 inches to 30 inches. One 10-foot length of PVC pipe will make five 24-inch or four 30-inch forms.
2. Split the PVC pipe lengthwise on one side only. This can be done with a saw. The split pipe can be taped top, bottom, and center using fiber tape to hold concrete until it is set.
3. The PVC pipe forms are set on end on the floor on a plastic sheet and properly supported.
4. Place a 1/2-inch diameter (No. 4) steel reinforcing bar in the PVC pipe form. This bar should be centered in the form and should extend the full length of the form.
5. Fill the PVC forms with fresh concrete. The concrete should consist of approximately one part cement, two parts sand, and three parts gravel, by weight, with sufficient water to provide approximately a 5-inch concrete slump. Use a maximum gravel size of 3/4 inch.

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6. Consolidate the concrete during placement by rodding and gently tapping the outside of the form.
7. The reference point on top of the monument can be a brass cap, available through GSA. Position the cap in the fresh concrete.

In lieu of the brass cap, the No. 4 reinforcing bar can be extended approximately 1 inch above the concrete to provide a reference point. This method provides a less conspicuous marker than a brass cap.

8. Allow at least 24 hours before removing PVC forms. Forms are removed by cutting tape and sliding the form off the concrete. Forms are re-useable.
9. Concrete should be allowed to cure for a minimum of seven days prior to field installation. Providing continuous moist curing during this seven day period will allow the concrete to attain its maximum strength.

Field Installation

1. The Service has purchased a gasoline-powered portable 4-inch diameter soil auger to simplify the installation of precast concrete monuments. The power auger will be loaned to field locations on request.
2. The installation consists of excavating a 4-inch diameter hole to the desired depth, inserting the monument, and tamping the ground adjacent to the monument to provide stability.
3. Approximate weight of a 30-inch monument is 31 pounds.

Approximate weight of a 24-inch monument is 26 pounds.

Approximate weight of a two-man auger with 3-foot length of 4-inch diameter flight auger is 56 pounds.