## FDM 9-75-1 Introduction

December 21, 2010

### 1.1 When Used

Right-of-way surveys include surveys to establish and monument new right-of-way boundary lines and/or to establish or reestablish existing right-of-way reference line monumentation. The marking of existing right-of-way points where monumentation has been disturbed or destroyed shall follow FDM 9-5-5 and FDM 9-50-10.

Temporary right-of-way points are established on a project where the location of points may be subject to change during negotiation or when a point is in a field (cultivated area) that may be cropped before acquisition.

Permanent right-of-way is usually staked after acquisition. Permanent markers are also reset on completed projects where original markers have been disturbed or destroyed.

### 1.2 Standards and Specifications

For temporary right-of-way points that are going to be used only for appraisal and acquisition purposes, the accuracy can be ± 0.5 feet except in cases of a fixed object such as a well, septic tank, utility structure, etc., being in close proximity of the right-of-way boundary line. In this case a location should be established with a positional accuracy of at least 1:3,000; methods used shall be capable of producing a positional accuracy of at least 1:10,000.

Permanent monumentation shall be placed to ensure relative positional accuracy of at least 1:3,000; methods used shall be capable of producing a positional accuracy of at least 1:10,000.

## FDM 9-75-5 Field Procedures

December 21, 2010

### 5.1 Methods

The monumentation of right-of-way points can be done by station offset, radial methods, or coordinates. The station offset would be most useful for replacing old right-of-way monuments and when staking for appraisal purposes when the reference line has been previously established.

When staking for appraisal the lath or stakes should be marked indicating what purpose or function they represent; e.g., existing R/W, new R/W, TLE, PLE, etc. One of the following methods may be chosen to identify the purpose of the lath.

- The purpose shall be written on the lath. Painting the lath pink is encouraged. Pink flagging should be attached.
- The lath may have the purpose identified by the color of the flagging attached to the lath: yellow indicating existing right-of-way, red for new right-of-way, blue for TLE, and lime for PLE. If there is potential for the single color of flagging to become confused with utilities being marked in the area, then pink flagging should be added to the above mentioned color flagging.

When staking for appraisal purposes, sensitive areas shall also be marked.

When staking radially or using coordinates, checks should be made to detect errors. This can be done by checking the station and offset to the reference line, if available, and by reshooting a right-of-way point previously set after moving to a new location with the total station. After the right-of-way boundary line has been established, the surveyor will need to check distances to any individual building within 100 feet of the proposed right-of-way line. Show a distance to the closest structure and a distance to the residence or principal structure, some of these dimensions will be shown on the plat, but they should be field checked. The survey crew shall dimension any encroachments that are not shown on the plat and check those that are shown.

### 5.2 Monumentation

When placing intermediate points for visibility, that are not on break points, it is permissible to use only the marker post and right-of-way plaque without the Type 2 monument. This should be noted on the plat as well as any other variation from normal monumentation. When remonumenting existing right-of-way, monument these points in the same manner as original monumentation was carried out.

All Type 2 monuments shall be placed using survey procedures that ensure relative positional accuracies of at least one part in 3,000 (1:10,000 methods). They shall be placed on the right-of-way boundary line and flush

with or slightly below the surrounding surface. A marker post for right-of-way boundary shall be placed close to each monument to serve as a guard post -- a visual indicator of the right-of-way -- and a marker to help locate the Type 2 monument. These posts shall be placed on the longer tangent of the intersection of the right-of-way lines. (See SDD 15A1 entitled "Marker Post for Right-of-Way"). In cases where a right-of-way point would fall in a front lawn, driveway, etc., the monument should be placed but the marker post may be omitted.

Monumentation of right-of-way lines shall be established before or at the time of land acquisition, as best suits the workload of each region. Desirably, it should be accomplished as early as possible, taking into consideration the work to locate the points and the probability of the monument being disturbed by the activities of the landowner, utility companies, and the contractor.

Temporary right-of-way points can be lath, spikes, paint, or ribbon. Permanent right-of-way points shall be a Type 2 monument along with a marker post to serve as a guard post. Marker posts for right-of-way shall conform to the approved standard detail drawing or approved alternate in the plan details. For all new right-of-way acquisitions in fee or by highway easement (and for those permanent limited easements which, in the opinion of the region office, monumentation is needed and desirable), a Type 2 monument shall be placed at every change in direction of the right-of-way boundary line including the beginning and ending of curves. In addition, supplemental monuments shall be placed when needed to ensure at least one monument every one-quarter mile on tangents and 500 feet on curves. Some regions have a requirement of placing a monument and marker post every 500 feet on tangents and 300 feet on curves to meet local needs. Check with the region in which the monumentation is being placed.

Intervisibility of markers posts is highly desired and spacing should be such that marker posts are intervisible at eye height when it is practicable to do so.

### 5.3 Computations

When using radial survey methods the surveyor should check with the Right-of-Way Plat Section to obtain the latest plat and coordinate listing for that project. This can be set up into a stakeout file on the data collector and can be accessed directly while out in the field through a stakeout routine while linked to the total station. There will possibly be intermediate points which can be computed and staked as needed. All points staked should be recorded on the right-of-way plat.

Regions should maintain a copy of the as-staked right-of-way plat which shows all points staked in the field.