Permanent Reference Elevations

General Information

To determine future settlements and deflection, permanent reference points will be required at designated locations on structures on the State highway system.

Instructions

Unless otherwise instructed, permanent reference points must be established along both sides of the structure at pier and abutment centerlines, at the mid-point of all spans over 50 feet in length, and at the ends of cantilevered wingwalls.

Permanent reference elevation points shall be placed so that they may be easily located, and so that a level rod may be placed on the point when making future elevation determinations.

To promote uniformity of locating permanent reference points, the following guidelines should be complied with:

1. On barrier railings having a metal rail element, use the top of the outside rail anchor bolt nearest the designated location as a permanent reference point. Bolts used as reference points shall be marked by chiseling or sawing a cross (x) in the top of the bolt.

2. Where structures have other types of rail with no vertical anchor bolts, or where the anchor bolts will be inaccessible, use special copper nails as permanent elevation points. These nails may be located in the top of sidewalk or curb, in the top of deck, or in the top of a concrete barrier rail. If located in curbs or sidewalks, place the nails about six inches from the curb face. If located in the deck surface, set the nails about six inches from the edge of deck.

Copper nails should be requisitioned from the local District office supply room.

At the completion of the job, elevations accurate to 0.005 foot must be taken on all permanent reference points. The District survey crew may be called in to elevate the permanent reference points. However, if the Structure Representative chooses to elevate the permanent reference points, the level should be peg-tested prior to taking the final elevations. Tie the level circuit to a permanent bench mark; do not use assumed elevations. A copy of the "field notes", which were recorded when establishing the "Permanent reference elevations", should be forwarded to the
Office of External Liaison and Support, Planning and Liaison Branch, Preliminary Investigations Section.

The elevation and location of all permanent reference points must be shown on the "As-Built" plans. Show on the bridge general plan if possible; otherwise, add a reference note on the general plan to indicate the sheet where the elevations may be found.

On structures where a special deflection study is required, instructions concerning the location of reference points and accuracy and frequency of reading elevations will be given to the Resident Engineer or Structure Representative at the beginning of the job. Since the purpose of these deflection studies is to provide information for the Research Section, the special instructions must be strictly followed.