SPECIAL INSTRUCTIONS FOR CITIES/COUNTIES

LOG OF PILING DRIVEN – ENR

The "Log of Piling Driven" (Form 830210) is used on all projects built under the supervision of the project engineer whenever piles are driven for any bridge structure. The purpose of the report is to show the calculated bearing obtained for each individual pile driven. The project engineer should prepare two copies of the report immediately upon completion of the driving of the piles in each pier or abutment. Do NOT wait until the piles are driven for the entire structure before submitting the reports. Submit these reports to the District Local Systems Engineer (DLSE). The DLSE will forward the original to the Office of Bridges and Structures.

Before signing the report, the project engineer should see that all information needed in checking the pile bearings shown is included in the report. The bearing value of the piles should be computed to the nearest one-tenth ton by the use of the formulas given in the standard specifications.

The piles should be driven in accordance with the specifications. The test blows to calculate the average penetration and pile bearing shall be taken immediately upon completion of driving.

The length of piles shown on the plans or ordered by the engineer indicates the desired penetration. Although the specified bearing may have been obtained, driving shall be continued until this penetration is secured as long as the pile moves readily under each blow of the hammer and shows no signs of damage.

Log down one piling in each foundation of every new structure. If driving is hard, a 2 to 3 ft. interval would be sufficient; but if little resistance to driving is encountered, 4 to 5 ft. intervals can be used.

This information should be entered on a separate "Log of Piling Driven" form and sent with the "Log of Piling Driven" report for the completed foundation work to the DLSE. The logged piling data should include all the usual information required on the regular "Log of Piling Driven" including the hammer and bearing calculation data.

Calculation of Pile Bearing

The modified ENR formula presently in our Specifications Book will be used. Attached are two completed samples of "Log of Piling Driven" (Form 830210) showing the method of calculating pile bearings.

These calculations are on the back of the sample reports and illustrate the method of determining the values of the factors W divided by W+M and 3WH separately. When there are variations in the weight of piles driven, weight of cap, drop of hammer, etc., the separate determination of the values of W divided by W+M and 3WH simplifies the calculating of the bearings of the various piles.

The value of W divided by W+M is determined without reducing the weight of the separate terms in the factor to tons. Since these weights are all given in pounds, it makes additional work to change them to tons and this additional calculation increases the chance of error.

The value of the factor 3WH is determined separately for all different drops of the hammer. In this instance, the weight of the hammer must be given in tons, but this is the only place where this is necessary.

The next step is to combine the two factors for which the values have been determined separately into the formula $P = \frac{3WH}{S+0.35} \times \frac{W}{W+M}$ to give the calculated bearing of the piles if driven vertically (i.e.gravity hammer with wood, steel H, or shell pile). For battered piles, the right member of this equation, after being reduced to its simplest form, is then multiplied by the batter factor (cosine a)-(f sine a) to give the calculated bearing. This batter factor will vary with each variation in the rate of batter of the piles, but in the example given is for a batter of one in four.

Calculation of Pile Weight

Occasionally reports are received which give a different weight for each pile and an almost equal variation in the drop of the hammer. This adds to the work of checking the reported bearings and in most cases is unnecessary. The weight of wood piles should be determined in accordance with the tables in this appendix, and the same weight should be used for all piles in a single foundation unless they are of different lengths or of a different species of wood. When steel or concrete piles are extended, the weight used in the formula need not be changed unless the extension is greater then ten feet in length. In most cases, the test blows can be taken with the same drop for all piles in a single foundation. In general, the energy of the hammer for the test blows should be at or near the maximum allowed by the specifications unless the ease of securing the required bearing or the type or condition of the piles is such as to make heavy driving unnecessary or impractical.

Show Calculations on Back of Report

Many pile driving reports are received in which errors have been made in calculating the bearing for the piles. Often the error consists of an incorrect method of applying the formula so that all reported bearings are incorrect. To simplify the checking of the pile driving reports and to aid in determining where the errors are being made, use the method shown on the back of the sample reports in calculating pile bearings. The calculations should be shown on the back of the ORIGINAL COPY ONLY of the report. This should not add to the work of preparing these reports since similar calculations must be made in all cases, and this method would simplify the work of checking the reports.

Filling Out the Report

The columns for plan length and extensions should be totaled and the length measured for payment should be shown on the report as the sample reports illustrate.

When it is necessary to extend steel piles, the length of extension, etc. shall be placed on the "Log of Piling Driven" as shown on the attached sample reports. The number of field splices required shall be reported.

The following information is to be added to the "Log of Piling Driven" (Form 830210) if welding of steel piles was necessary:

1. Name of certified welder(s)
2. Certificate number(s)
3. Date(s) piles were welded

Steel Pile Cutoffs

Article 2501.20, Paragraph D, establishes the procedure for cutoffs. See *Construction Manual 11.24* for guidance.

FALSEWORK PLANS

Refer to *Construction Manual 11.31* for guidance on falsework.

The contractor must use a licensed professional engineer for falsework plans. The project design engineer (city or county) shall review the falsework plans.