

..... DIVISION OFFICE  
**1999 INSPECTION GUIDE (METRIC VERSION)**  
**Major Structures - (Foundations)**

Scope of Inspection:

Major Structures

- Foundations

This outline is intended to aid in the review of foundations for both spread footings and piling. The Area Engineer is provided the flexibility of using the guideline in its entirety or portions depending on the job conditions and time limitations. This guide may be supplemented as deemed necessary by the Area Engineer for items distinct to the individual project.

Project Data:

Project No.

County:

Inspection Made By:

In Company With:

Date of Inspection:

% Time Elapsed:

% Work Completed:

References:

- - 1994 ..... Specifications,
- - July 1, 1998 Supplemental Specification,
- - Special Provisions,
- - Latest AASHTO Guides with Interims,
- - Bridge Construction Manual

**MAJOR STRUCTURES - FOUNDATIONS**

Type of foundations reviewed:

**A. OFFICE PORTION**

(Dates of Documents Reviewed)

1. Documentation of Quantities and Work:
  - a. In regard to quantities and work items, comment on the documentation and cross referencing in the Supervisor's Daily Reports, Inspector's Daily Reports (IDR's), and HL-440's.
  - b. Review plan quantities used and comment on any overruns and underruns occurring or anticipated.
  - c. What reasons are attributed to the overruns or underruns?
2. Information contained in the Inspector's Daily Reports (IDR's):

On **Spread Footings** review the IDR's as to the completeness of the following information items:

- a. Are the foundation units recorded (abutment, pier, etc.)?
  - b. Is the excavation down to the proper elevation?
  - c. Note the type of material encountered at the footing elevation.
  - d. Is the excavation going as expected or not?
  - e. Is the condition of the foundation before the footing was placed noted (compacted, loose material, etc.)?
  - f. Has the reinforcing steel been checked?
  - g. Is information on the concrete placement operation and corresponding test results noted?
  - h. Any redesigning noted due to foundation conditions?
3. On **Pile Foundation - Section 616** review the IDR's as to the completeness of the following information items:
- a. Is the type and size of piling being installed in compliance with the required contract provisions?
  - b. Is the condition of the piles noted?
  - c. Is the pile driving equipment certified?
  - d. Are the proper pile tip elevations being achieved?
  - e. Are the piles properly oriented within the specified limits of a maximum 150 mm deviation from plan site, turned in the proper direction, and having a minimum 225 mm clearance to footing edge -(Section 616.6)?
  - f. Are the pile blow counts noted for vertical piles, including sudden variations, as well as, 20 blows/25 mm at refusal - (Section 616.8.2)?
  - g. Are the predrilled holes, where applicable, to the proper diameter and backfilled with the proper material?
  - h. Any redesigns noted due to the foundation conditions encountered?
  - i. Are forms HL-422 and HL-423 being properly completed?
4. Material Records:
- a. For Steel H-Piles, Timber Piles, and Prestressed Concrete Piles review and comment on the following certifications:
    - Pile driving equipment certification (including information maximum angle of batter and energy/blow - Section 616.4)
    - Pile material certification
    - Splice certification
    - Tip certification
  - b. If load tests are required comment on the results.
  - c. For Cast-in-Place concrete piles, Class "B" Concrete (Section - 601) is required. Are all the required field tests being performed and comment on the compliance of the test results?
    - Air (7% + 2.5%)
    - Slump (75 mm + 25 mm)
    - Cylinders

- Temperature (Mix, < 32°C and Air, < 30°C)
- Aggregate Gradation
- Strength (> 21 MPa)

- On acceptance sampling, comment on the frequency, failures, and comparisons with job control samples.
- Where are the control charts being maintained (project or plant)?
- Are the control charts current and complete?
- Is laboratory test documentation available for the following?
  - Water
  - Cement
  - Air Entraining Agent
  - Retarder
  - Curing Compound
  - Reinforcing Steel

If so, comment on the findings.

- Are concrete mix designs available and approved for each class of concrete?
- Is the concrete plant approval current?
  - Note its classification and method of mixing.
- Has a Quality Control Plan been submitted and approved?

- Based on your review of the above, are the procedures used to document quantities and materials certification adequate?

## **B. FIELD PORTION**

### **1. Spread Footings:**

- Record the foundation units (Abutment A, Pier 1, etc.) inspected?
- Has all required excavation been performed down to the plan elevation?
- Are the actual foundation materials at the plan elevation consistent with the materials shown on boring logs?
- Has the foundation material been properly prepared (compacted, loose material removed, etc.)?

### **2. Pile Foundation:**

- Note the type and size of piling being installed and indicate whether they comply with the contract requirements ( HP 250x62, etc.)
- Note the type of driving equipment being used (hammer, leads, follower, cap block, etc.) and indicate whether it complies with specifications.
- Are the piles being driven in the locations shown on the plans?
- Are the piles being driven to the required bearing capacity and/or tip elevation?

- e. Are the pile heads clean and undamaged (Section - 616.3.2)?
- f. Is the orientation of steel H piles correct (Section - 616.6)?
- g. Are the pile heads cut at right angles to the pile and are the cut offs within two inches of plan cut off?
- h. The maximum angle of batter for the specific hammer being used should be checked. The batter of the piles being driven must not exceed this maximum. Comment on your field finding in regard to this matter.
- i. If piling is predrilled, are the holes to the proper diameter (85% of depth of the pile section) and backfilled with the proper material (Section - 616.15)? If piles are socketed into rock, the diameter of predrilled holes shall be 100% of the diagonal dimension of the pile.

**C. Closeout Conference:**

1. Discuss all findings and come to an agreement on corrective actions when required.
2. Any recommendations from the review or from the project personnel?