Forms

STRUCTURE BULLETIN

NCDOT Construction Unit

Website email

Current Issues: Overhead Power Lines

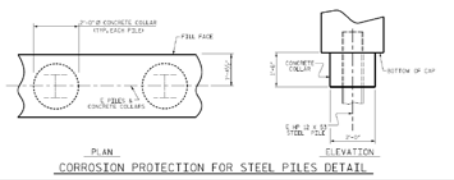
A common hazard on construction sites is overhead power lines. A piece of equipment does not have to touch a line in order to become energized. Electricity can arc significant distances depending on the line voltage and atmospheric conditions. The operator is also not the only person in danger. Anyone close to or touching the equipment can be shocked. People working the end of a concrete pump nozzle, rigging a load, or standing too close to a machine can also be in danger.

The general rule-of-thumb is to maintain 20' of clearance between all parts of the machine and rigging and the line. This link to the OSHA regulations on this subject gives more detail on proper distances and protective measures. Included in this document is the table below which gives more detailed information on proper distances according to the line voltage.

TABLE A—MINIMUM CLEARANCE DISTANCES

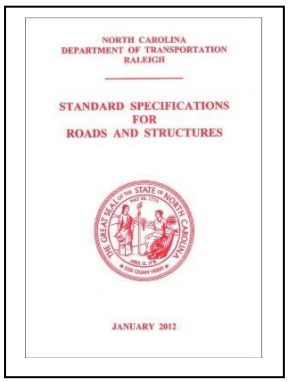
Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.



Pile Collars:

In some cases the end bent cap can be undermined, exposing the tops of the pile under the cap. Pipe collars (18" deep concrete collars added below the bottom of cap) are intended to be additional corrosion protection for the top of the pile. It can be difficult to clean out the excavation for the collar after the forms and rebar are set. Therefore, while not shown in the detail, it is permissible to put a construction joint between the collar and cap. The collar could then be poured before the forms and steel are set.



Special Provision Questions:

Question: Can the contractor use Radial Stakeout to perform structure layout?

Answer: No, with very few exceptions. Section 801directs the contractor to perform surveying in accordance with section 801 **and** the Manual for Construction Layout. Figure 17.1a in the manual contains a note stating *"Turn bent angles from centerline to Bent Lines and record distances from centerline of bridge to the reference points. Bridges should not be layed out using radial stakeout unless prior approval has been obtained."* The engineer should only approve radial stakeout in situations where it is not possible to perform the layout conventionally. This should only be in cases where bents are over water, or other such situations, and should be a very small percentage of the structures we build. Additionally, in these situations all bents where conventional layout is possible should be staked conventionally. Any surveying by the Department should follow these same guidelines.

Another problem area is offsets. The manual calls for a minimum of three reference hubs on each side of centerline with tacks. If it is not practical to set tacks a "crowsfoot" or PK on the adjacent structure will suffice. Reference points should be spaced well and should be a significant distance from centerline. Batterboards with two reference points behind them is a good layout. Ideally, these would be placed far apart enough to ensure accuracy, but close enough to pull a string between all points.

The manual also requires the contractor to provide the engineer with layout drawings for approval.

Concrete testing videos Available:

Videos of the proper procedures for ASTM testing of concrete can now be found at the Construction Unit Training YouTube playlist.

Training:

PDF copies of the Winter Inspector Training presentations can be found at the following link:
2018 Structure Inspector Training

Structure Bulletins

are now archived on the Construction Unit website under Construction Resources.

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